

Phase II Site Investigation Report

On behalf of F3 Architects LLP

807 High Road, Tottenham, London, N17 8ER

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1. INTRODUCTION

1.1. General

Ground and Water Limited were instructed by F3 Architects LLP on the 11th of July 2022 to conduct a site investigation on the site at 807 High Road, Tottenham, London N17 8ER. The scope of the investigation was detailed within the fee proposal GW-0127, dated the 1ST of October 2021.

1.2. Aims of the Investigation

The aim of this report was to supply the client and their designers with information regarding the ground conditions underlying the site to assist them in preparing an appropriate scheme for development.

A contamination assessment was to be undertaken following chemical laboratory testing on soil samples recovered from the site to enable recommendations for the safe redevelopment of the site and the protection of site workers, end-users and the public from any potential contamination identified.

This Site Investigation Report must be read in conjunction with the third-party Desk Study Report referenced: WIE16362 – 101 – R -1.2.1 – PRA 807 - High Road, Tottenham, London, March 2020. Ground and Water Limited cannot be held liable for any shortcomings of the report.

The techniques adopted for the investigation were chosen considering the requirements of the client, anticipated ground conditions, and bearing in mind the nature of the site, limitations to site access and other logistical limitations.

1.3. Conditions and Limitations

This report has been prepared based on the terms, conditions and limitations outlined within Appendix A.

1.4. Technical Glossary

Generic technical terms and their description can be viewed within the glossary provided within Appendix B.

2. SITE SETTING

2.1. Site Location

The site comprised a ~585m² irregular shaped plot of land, orientated in an east to west direction, along the western side of High Road. The site was located in the northern portion of Tottenham, north London.

The national grid reference for the centre of the site was approximately TQ 33850 91467. A site location plan is given within Figure 1.

2.2. Site Description

At the time of site works, August 2022, the existing development comprised a single storey club house for staff training and storage.

2.3. Proposed Development

At the time of reporting, September 2022, the proposed development was understood to comprise the demolition of existing buildings; the erection of a replacement building up to four storeys to include residential (C3), retail (A1) and flexible D1/B1 uses; hard and soft landscaping works including a residential podium; and associated works.

The proposed development fell within Geotechnical Design Category 2 in accordance with Eurocode 7. The proposed development plan can be seen within Figure 2.

2.4. Geology

The British Geological Survey Solid and Drift Geology Map for the Tottenham area (North London Sheet No. 256) revealed that the site was underlain by the superficial Kempton Park Gravel Member and bedrock deposits of the London Clay Formation (clay and silt). No areas of Made Ground or Reworked Ground were noted within a 250m radius.

A BGS borehole recorded in similar geology ~250m north-west of the site (ref.: TQ39SW226) noted Made Ground, overlying a brown loam underlain by blue and grey clay for the remainder of the borehole.

2.5. Hydrogeology and Hydrology

The DEFRA online maps indicated that the site was located on Secondary (A) Aquifer associated with the superficial Kempton Park Gravel Member, underlain by Unproductive Strata associated with the London Clay Formation.

From analysis of hydrogeological and topographical maps the groundwater table was anticipated to be encountered at shallow to moderate depth within the Kempton Park Gravel Member capping the impermeable London Clay Formation.

Perched water was also likely to be found within the Made Ground, especially after periods of intense or prolonged rainfall. It was considered that the groundwater was flowing eastwards, towards the River Lea and in alignment with local topography.

No surface water features were noted within a 250m radius of the site. The nearest surface water feature was observed to be The Mosell ~350m south-west to site.

Examination of the Environment Agency records showed that the site fell within a Flood Zone 1 (an area with a low probability of fluvial or coastal flooding). The site was not protected by flood defences or benefiting from flood storage.

2.6. Radon

BRE 211 (2015) Map 5 of the London, Sussex and west Kent area indicated that the site **was not** located within an area where mandatory protection measures against the ingress of radon were likely to be required.

A review of the freely available UK Health Security Agency radon database, UK Radon, indicated that the site was located within a 1km grid square, where the maximum radon potential of <1% was recorded. Basic radon protection measures are required in areas where more than 3% of houses are at or above the Action Level.

The site was in an area where a risk assessment was not required.

2.7. Internet Search (Site Setting)

2.7.1. Available Unexploded Ordnance (UXO) Map Review

A review of the data available on www.zeticauxo.com/ revealed the site was located within the London high-risk area associated with unexploded ordnance (UXO). The London area is further separated into 25No. categories based on bombing densities, where green is indicated for areas having <10 bombs dropped per km² and red is indicated for areas having >150 bombs dropped per km². The site is situated within the orange area, ~halfway through the spectrum.

2.7.2. Historical Landfill Tool Review

A review of the data available on www.groundsure.io/ revealed that no areas of historical landfill were within a 250m radius of the site.

2.8. Preliminary Risk Assessment

The tabulated Conceptual Site Model was developed from the report WIE16362 – 101 – R -1.2.1 – PRA 807 High Road, Tottenham, London, March 2020 and is outlined overleaf. For ease of reference and understanding, the risks have been classified within this risk assessment against four possible levels / categories, summarised in the table below. Any risk deemed to be negligible within the Preliminary Risk Assessment have been excluded from this report.

Risk Categories used in the Tabulated CSM	
Low Risk	Regarding this potential SPR linkage, the site is considered suitable for the proposed end-use and there is not considered to be an unacceptable risk to receptors. However, it is considered that further investigation to confirm this is recommended.
Moderate Risk	Regarding this potential SPR linkage, the site may not be suitable for the proposed end-use in its current condition and there may be an unacceptable risk to receptors. Further investigation is required to confirm this.
High Risk	Regarding this potential SPR linkage, the site is probably or certainly not suitable for proposed end-use and there is likely to be an unacceptable risk to receptors. Contaminants probably or certainly present and urgent action required in the short term.

Tabulated Conceptual Site Model – Pollutant Linkage Summary			
Potential Sources	Linkage	Potential Receptors	Risk Classification
Human Health			
Dust and surface runoff from construction materials storage, stockpiled soils and bare earth surfaces during construction	Dermal contact, inhalation and ingestion.	Offsite residents/users; construction worker	Moderate
Shallow ground contamination from former activities on site and surrounding land uses	Dermal contact, inhalation and ingestion.	Construction workers	Moderate
Property			
Shallow ground contamination from former activities onsite and surrounding land uses	Contact with building foundations and buried services	Future on-site structures	Low
Ground gas and vapour emissions	Ingress into confined spaces within buildings	Future on-site receptors	Low
Ecological systems			
Shallow ground contamination from former activities on-site and surrounding land – uses	Lateral migration of ground contamination to soil	Future onsite and off-site receptors and residents	Low
Controlled waters			
Contamination from former activities on-site and surrounding land – uses	Leaching of ground contamination to groundwater	Secondary A Aquifer in the Kempton Park Gravel Member	Low

3. SITE WORKS

3.1. Scope of Works

Site works were undertaken on 9th August 2022 and comprised the drilling of 5No. Windowless Sampler Boreholes (WS1 – WS5) to a depth of 3.10m – 4.00m bgl.

Additionally, further site works were undertaken on the 16th August 2022 and comprised 8No. Foundation Exposures (TP/FE1 – TP/FE3 and TP/FE5 - TP/FE9) hand excavated to 1.20m bgl, to expose the foundations of the existing building.

The location of the trial hole locations can be seen within Figure 3.

As a further precautionary measure, the borehole was hand excavated to 1.20m below the local ground level (bgl) and scanned with a Cable Avoidance Tool (CAT scanner) to minimise the risk to services.

Upon completion of the drilling works, the trial holes were backfilled and made good, in relation to the surrounding area.

3.2. Sampling Procedures

Small disturbed samples and environmental samples were recovered from the trial holes at the depths shown on the trial hole records. Soil samples were generally retrieved from each change of strata and/or at specific areas of concern. Samples were also taken at approximately 0.5m intervals during broad homogenous soil horizons.

A selection of samples were despatched to a laboratory for chemical testing purposes.

4. ENCOUNTERED GROUND CONDITIONS

4.1. Soil Conditions

The trial holes were logged by a Ground and Water Limited representative, generally in accordance with BS EN 14688 'Geotechnical Investigation and Testing – Identification and Classification of Soil'.

The ground conditions encountered within the trial holes constructed on the site did generally conform to that anticipated from examination of the geology map. A capping of Made Ground was noted to overlie the superficial Kempton Park Gravel Member.

The succession of conditions and description of soils encountered in the trial holes in descending order is tabulated below.

Summary of Strata Encountered (WS1 – WS5)			
Strata	Top Depth (m bgl)	Base Depth (m bgl)	Thickness (m)
CONCRETE	GL	0.09 – 0.22	0.09 – 0.22
MADE GROUND (WS1 – WS5): Dark brown clayey gravelly fine to coarse SAND. Gravel was subangular to subrounded fine to coarse flint, brick and concrete. To see the percentage of various fragments within the Made Ground, please refer to the logs found within Appendix D.	0.09 – 0.22	1.10 - 2.20	1.01 – 1.98
KEMPTON PARK GRAVEL MEMBER (WS1 – WS5): Orangish brown clayey gravelly fine to coarse SAND. Gravel was subangular to subrounded fine to coarse of flint.	1.10 - 3.30	2.60 - >3.60	>0.30-- 1.50
KEMPTON PARK GRAVEL MEMBER (WS2, WS3, WS5): Orangish brown sandy very gravelly CLAY. Sand was fine to medium. Gravel was subangular to subrounded fine to medium flint.	1.50 – 2.20	2.70 - 3.30	0.50-- 1.80
KEMPTON PARK GRAVEL MEMBER (WS4, WS5): Orangish brown sandy clayey subangular to subrounded fine to coarse GRAVEL of flint. Sand was fine to coarse.	2.70 - 3.00	>3.10 - >4.00	

Summary of Strata Encountered (TP/FE1 – TP/FE3 and TP/FE5 - TP/FE9)			
Strata	Top Depth (m bgl)	Base Depth (m bgl)	Thickness (m)
CONCRETE/FLOORING (TP/FE2, 3, 6, 7, 9)	GL	0.10 - 0.20	0.10 - 0.20
MADE GROUND (TP/FE1 – 3 and 5 - 9): Generally, brown gravelly fine to coarse SAND. Gravel was subangular to subrounded fine to coarse fragments of flint, brick and concrete. To see the percentage of various fragments within the Made Ground, please refer to logs found within Appendix D.	GL – 0.20	0.30 – 0.50	0.20 – 0.30
KEMPTON PARK GRAVEL MEMBER (TP/FE1 - 3, 5 - 9): Orangish brown gravelly clayey fine to coarse SAND. Gravel was subangular to subrounded fine to medium flint.	0.30 - 0.50	>1.20	>0.70 - >0.90

For details of the composition of the soils encountered at particular points, reference must be made to the individual trial hole logs within Appendix D of this report. A trial hole location plan can also be viewed within Figure 3.

4.2. Groundwater Conditions

No groundwater was encountered during the intrusive investigation.

Changes in groundwater level occur for a number of reasons including seasonal effects and variations in drainage. The investigation was undertaken in August 2022 when groundwater levels are likely to be at their annual minimum (lowest elevation). Exact groundwater levels may only be determined through long term measurements from monitoring wells installed on-site.

4.3. Foundation Exposures

The hand excavation of 8No. internal Foundation Exposures (TP/FE1 – TP/FE3 and TP/FE5 - TP/FE9) was undertaken across the site. A tabulated summary showing the depth and width of each foundation can be viewed below, as well as the bearing stratum. Diagrams of each foundation exposure can be viewed within Figures 4 - 12.

Summary of Foundations Encountered			
Trial Hole	Depth of Foundation (m bgl)	Width at the Base of Foundation (mm)	Bearing Stratum
TP/FE1	0.90	0.20	Kempton Park Gravel Member
TP/FE2	0.70	0.20	Kempton Park Gravel Member
TP/FE3	0.90	0.10	Kempton Park Gravel Member
TP/FE5	0.80	Does not step out	Made Ground
TP/FE6	0.80	0.15	Kempton Park Gravel Member
TP/FE7	0.80	0.10	Kempton Park Gravel Member
TP/FE8	0.80	0.15	Kempton Park Gravel Member
TP/FE9	0.50	Does not step out	Kempton Park Gravel Member

4.4. Obstructions

An item of furniture was blocking the location of TP/FE4.

No other artificial or natural sub-surface obstructions were noted during construction of the trial holes.

5. CONTAMINATION RISK ASSESSMENT

5.1. Results of the Preliminary Risk Assessment

The tabulated Conceptual Site Model (CSM) developed by the Waterman Infrastructure and Environment limited report; WIE16362 – 101 – R -1.2.1 – PRA 807 High Road, Tottenham, London, March 2020 reproduced in section 2.8. For the complete information please see the Desk Study report.

No additional source of contamination, pathway or receptor was identified between the desk study and the ground investigation and as such, it was not necessary to modify the CSM.

In the UK, the assessment of risk from contamination follows the source-pathway-receptor (SPR) approach. For a risk to be present there must be a source of contamination, a receptor or receptors, and a pathway for contaminants to migrate or be absorbed. If there is a linkage between any given source and receptor, then a quantitative risk assessment is used to assess the significance or impact of the pollutant linkage.

5.2. Sampling Locations

The synopsis for the trial hole locations and their final depth can be seen tabulated below. A trial hole location plan is provided within Figure 3. The table also indicates whether any locations targeted a source of contamination as well as the proposed end-use. The proposed development can be seen in Figure 2.

Trial Hole Location Synopsis		
Trial Hole/Final Depth	Sampling Strategy	Proposed End-Use
WS2/3.60	Random	Footprint of Proposed Building
WS3/3.60	Random	Footprint of Proposed Building
WS5/3.10	Random	Footprint of Proposed Building

The investigation area totals approximately 585m² I would do and with 14 sampling locations, given an unknown hotspot shape, the sampling density means that a hotspot with an area of approximately 62.36m² and a radius of approximately 19.85m would be encountered (CLR 4).

5.3. Soil Risk Assessment

Sampling depths were chosen to reflect the receptor of concern (e.g. human health, controlled waters and vegetation). The remaining samples were scheduled under a random strategy. The receptors relevant to the sampling depths are tabulated below.

Summary of Receptors per Sample Depth	
Depth	Receptors
Shallow Samples (< 0.75m bgl)	- End Users (Residents/Future site visitors) - Construction workers during development - Site operatives during maintenance works - Neighbours and public - Vegetation within soft landscaped areas (shallow rooted) - Secondary A aquifer (Kempton Park Member) - Buried Concrete - Receiving landfill
Moderate Samples (0.75 – 1.50m bgl)	- Construction workers during development - Site operatives during maintenance works - Vegetation within soft landscaped areas (deep rooted)

	• Secondary A aquifer (Kempton Park Gravel Member) • Buried Concrete • Receiving landfill • Underground services (water pipes)
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Chemical laboratory testing, scheduled by Ground and Water Limited, and carried out by ALS Environmental, was undertaken on three samples of Made Ground. The samples were subjected to a combination of analysis that comprised:

- Asbestos screen;
- Semi-metals and heavy metals incl. Arsenic, Cadmium, Chromium (incl. Hexavalent Chromium), Copper, Lead, Mercury, Nickel, Selenium, Vanadium, Zinc;
- Polycyclic Aromatic Hydrocarbons (PAH's) incl. Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene, Benzo(ghi)perylene;
- Speciated TPH including full aliphatic/aromatic split;
- BTEX compounds (Benzene, Toluene, Ethylbenzene, Xylene) and MTBE – used as marker compounds for Volatile Organic Compounds (VOCs);

A breakdown of the number of tests undertaken for each determinand is discussed in further sections. The chemical laboratory results are presented in Appendix E.

5.3.1. Soil Assessment Criteria and Results

At the time of reporting, September 2022, the proposed development was understood to comprise of the demolition of existing buildings; the erection of a replacement building up to four storeys to include residential (C3), retail (A1) and flexible D1/B1 uses; hard and soft landscaping works including a residential podium; and associated works.

Based on the proposed development, the results of the chemical laboratory testing were compared to the Generic Assessment Criteria (GAC) for a '**Residential without homegrown produce**' land-use scenario, as this was considered the most appropriate land-use scenario.

Where a contaminant of concern's GAC varies according to the Soil's Organic Matter (SOM), the SOM recorded for each uncontaminated soil type was used to derive the appropriate GAC for each soil type. A SOM value of 1%, the most conservative value, was utilised.

A summary of the analytical results and the comparison to the determinands adopted screening value are presented in the table below and overleaf.

Soil Contamination Test Results and Screening Values					
Determinand	Number of Samples	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)	Adopted Screening Value (mg/kg)	Was the adopted screening value exceeded for relevant land-use scenario?
INORGANICS					
Asbestos	3	ND	ND	ND	No
Cyanide (total)	3	< 2	< 2	24	No
Phenols	3	< 2	< 2	280	No
METALS					
Arsenic	3	9.16	13.9	40	No
Boron	3	<1	1.09	11,000	No
Cadmium	3	0.151	0.278	85	No
Chromium (III)	3	7.68	14.1	910	No
Chromium (Hexavalent)	3	<0.6	<0.6	6	No
Copper	3	38.5	118	7,100	No
Lead	3	97.7	189	310	No
Mercury	3	<0.1	0.642	1.2	No
Nickel	3	11.9	17.2	180	No
Selenium	3	<1	<1	430	No
Vanadium	3	21	35.9	1,200	No
Zinc	3	56.1	124	40,000	No
TOTAL PETROLEUM HYDROCARBONS (TPHs)					
Aliphatic >C5 - C6	2	<0.01	<0.01	42	No
Aliphatic >C6 - C8	2	<0.01	0.0561	100	No
Aliphatic >C8 - C10	2	<0.01	0.0634	27	No
Aliphatic >C10 - C12	2	<1	<1	130	No
Aliphatic >C12 - C16	2	<1	<1	1,100	No
Aliphatic >C16 - C21	2	<1	13.5	65,000	No
Aliphatic >C21 - C35	2	<1	8.64	65,000	No
Aromatic >C5 - C7	2	<0.01	<0.01	370	No
Aromatic >C7 - C8	2	<0.01	<0.01	860	No
Aromatic >C8 - C10	2	<0.01	0.0427	47	No
Aromatic >C10 - C12	2	<1	<1	250	No
Aromatic >C12 - C16	2	<1	<1	1,800	No
Aromatic >C16 - C21	2	<1	3.16	1,900	No
Aromatic >C21 - C35	2	2.5	16.5	1,900	No
Benzene	2	<0.009	<0.009	0.38	No
Toluene	2	<0.007	<0.007	880	No
Ethylbenzene	2	<0.004	<0.004	83	No
m,p-Xylene	2	<0.01	<0.01	79	No
o-Xylene	2	<0.01	<0.01	88	No
POLYCYCLIC-AROMATIC HYDROCARBONS					
Acenaphthene	3	<0.008	<0.008	3,000	No
Acenaphthylene	3	<0.012	<0.012	2,900	No
Anthracene	3	<0.016	0.0251	31,000	No
Benzo(a)anthracene	3	0.028	0.124	11	No
Benzo(a)pyrene	3	0.0247	0.117	3.2	No
Benzo(b)fluoranthene	3	0.0387	0.176	3.9	No
Benzo(ghi)perylene	3	<0.024	0.0843	360	No
Benzo(k)fluoranthene	3	<0.014	0.0614	110	No

Chrysene	3	0.0296	0.117	30	No
Dibenzo(a,h)anthracene	3	<0.023	<0.023	0.31	No
Fluoranthene	3	0.0536	0.232	1,500	No
Fluorene	3	<0.01	<0.01	2,800	No
Indeno(1,2,3-cd)pyrene	3	0.024	0.106	45	No
Naphthalene	3	<0.009	0.0188	2.6	No
Phenanthrene	3	0.0267	0.1	1,300	No
Pyrene	3	0.0486	0.203	3,700	No
MARKER FOR VOLATILE ORGANIC COMPOUND					
Methyl tert-butyl ether (MTBE)	2	<0.01	<0.01	73	No
The derivation of the Soil Assessment Criteria used within this report can be seen within Appendix F. The soil concentrations were typically compared to the LQM/CIEH Suitable for Use Levels (S4UL) (2014), based upon the assumption of 1% soil organic matter. A screening value for Lead is based on the Category 4 Screening Levels (C4SLs). Where no S4UL or C4SL is available for Cyanide, a SoBRA acute GAC is assigned. Where no S4UL or C4SL is available for MTBE, a CL:AIRE 2010 GAC is assigned. Where exceedances are noted, the trial hole and depth of sample is recorded.					

5.3.2. Soil Assessment

Chemical laboratory testing revealed no elevated levels of determinands in the samples tested were in excess of the 'Residential without home-grown produce' land-use scenario adopted. Should the proposed development change post reporting date of September 2022, then further assessment should be undertaken and adopted land-use scenario may require altering to be representative of the updated proposed end-use.

The intrusive investigation also did not reveal any visual or olfactory evidence to suggest any hydrocarbon-type contamination in the trial holes excavated on the site. The chemical laboratory results have verified that no elevated concentrations of aliphatic/aromatic hydrocarbons (C5-C35) or BTEX compounds are present in the soils underlying the site, based on the 3No. sample tested.

No asbestos has been identified during the testing, however, an Asbestos Management Strategy should be put in place so that any potentially asbestos containing materials are identified and removed from site in a suitable manner to prevent cross-contamination. An Asbestos Survey should be undertaken on the existing property prior to its demolition.

5.3.3. Water Supply Pipe Risk Assessment

As part of the proposed development it is expected that new water supply pipes will be installed at the site. Water supply pipes have the potential to be exposed to contaminants in the ground that can lead to unacceptable concentrations within the drinking water. If a risk is identified, specialist pipes that are protective of the drinking water are required.

A pipe selection risk assessment should be submitted to the water supply company as part of the development based on the supplier's assessment criteria. An indication of whether there is likely to be a risk can be seen tabulated below, where the PE pipe thresholds are based on *UKWIR Contaminated Land Assessment Guidance, 2014*.

Pipe Selection Risk Assessment			
Determinand	PE Pipe Threshold (mg/kg)	Laboratory Analysis Range (mg/kg)	Was the Threshold Exceeded?

Total BTEX and MTBE	0.1	< 0.018	No
Total VOCs	0.5	N/A	No
Total SVOCs	2	N/A	No
Phenols	2	<0.035	No
TPH EC5 – EC10 (aliphatics and aromatics)	2	LOD	No
TPH EC10 – EC16 (aliphatics and aromatics)	10	LOD	No
TPH EC16 – EC40 (aliphatics and aromatics)	500	LOD	No
Naphthalene	5	LOD	No

The results indicate that no determinands were above the threshold for the use of a PE pipe at the site.

5.4. Groundwater Risk Assessment

In the UK, the water environment is protected under a number of regulatory regimes, mainly governed by the Environment Agency. The Environment Agency is consulted when there may be a risk to Controlled Waters, or where a pollution incident has occurred historically. The Water Framework Directive is implemented in various guises covering groundwater, surface water and drinking water supply.

The soil samples analysed as part of the risk assessments in section 4.3 have been used to undertake a Level 1 (soils) Controlled Waters risk assessment. At Level 1 (soils), the conceptual site model and the determinand concentrations of the soils are used to indicate whether the concentrations are sufficient to impact the receptor. At this stage, dilution, dispersion and attenuation along the pathway are not considered.

A study of the aquifer maps on the Defra website revealed the site was underlain by a **Secondary A Aquifer** comprising the superficial Kempton Park Gravel Member, underlain by **Unproductive Strata** comprising bedrock deposits of the London Clay Formation. Examination of the Environment Agency records showed that the site **did not** fall within a Groundwater Source Protection Zone (SPZ) as classified in the Policy and Practice for the Protection of Groundwater.

No surface water features were noted within a 250m radius of the site. The nearest surface water feature was observed to be The Mosell ~350m southwest to site.

From analysis of hydrogeological and topographical maps, groundwater was anticipated to be encountered at shallow depth (1 – 3m bgl), within the Kempton Park Gravel Member and it was considered that the groundwater was flowing in a south-easterly direction, towards the River Lea.

During the site investigation, Made Ground was encountered to a maximum depth of 2.20m bgl, overlying sandy clay, sandy gravels and gravelly clayey sands of the Kempton Park Gravel Member to the base of the borehole (4.00m bgl). No groundwater strikes were encountered.

Comparison between the soil laboratory analysis and the derived Level 1 (soils) target concentrations indicate that Cadmium, Copper, Mercury, Nickle, Selenium, Acenaphthene, Acenaphthylene, Anthracene, Benzo (b) pyrene, Benzo (ghi) perylene, Benzo (k) fluoranthene, Chrysene, Fluoranthene, Fluorene, Phenanthrene, Pyrene are elevated and have the potential to pose a risk to Controlled Waters. It should be noted that a number of determinands at laboratory limit of detection exceed the

target concentration for a Level 1 (soils) risk assessment, most notably PAHs. Where a determinand is identified at the laboratory limit of detection, no further assessment is considered necessary.

Given the Level 1 risk assessment does not consider dilution, dispersion or attenuation, and the conceptual site model shows the nearest receptor to be The Mosell ~350m south-west of the site, it is not expected that the soils on-site represent an unacceptable risk to controlled water receptors. No further action is considered necessary.

The findings of this risk assessment should be agreed with the Environment Agency.

5.5. Ground Gas Risk Assessment

A review of freely available information prior to site works, including historical mapping and landfill registers / Phase I desk study, did not identify any potential sources of ground gas on-site or within influencing distance of the site that warranted investigation through ground gas monitoring. The only source of ground gases was anticipated to be limited Made Ground and therefore classified as 'Low risk', where the pragmatic approach to ground gas risk assessment presented within the CL:AIRE research bulletin RB17 and included within Annex D of BS8485:2015+A1:2019 can be considered.

5.5.1. Pragmatic Approach

The alternative approach to ground gas risk assessment considers the uncertainty from the measurement of ground gas concentrations and flow rates in monitoring wells for low-risk sites and removes the need for monitoring. Low risk sites typically comprise:

- Natural soils with high carbonate content (e.g. chalk);
- Natural soils that can produce gases (e.g. alluvium, peat etc.);
- Made Ground between 1.00m to 5.00m, with low organic content; and
- Areas of flooded mine workings, unless a building is to be within 20m of shaft or adit.

The method considers the gas generation potential of the soils from data that is not subject to external influences, for example atmospheric pressure can change the recorded flow and concentrations of ground gas during spot monitoring, or a rising groundwater level can displace ground gases in pore spaces. Determination of the characteristic situation is based on the total organic carbon (TOC) of the soils, coupled with any organic-rich material identified within the borehole logs, such as wood gravels. TOC is easily analysed by the laboratory and can also be calculated by the equation outlined below.

$$\text{Total Organic Carbon (TOC)} = 0.58 \times \text{Soil Organic Matter (SOM)} = 1.33 \times \text{Degradable Organic Carbon (DOC)}$$

As part of the ground investigation works, three samples were submitted to the laboratory for analysis, which identified TOC to vary between 0.586% - 1.55% in the Made Ground. The trial hole logs identified the gravels within the Made Ground to comprised of flint, brick, and concrete. Made Ground was identified to a maximum depth between 1.01m and 2.20m bgl.

5.5.2. Data Quality

A review was made of the quality of the available data for the site, which can be viewed in the table below. CIRIA Report C665 (2007), BS 8485:2015+A1:2019 and BS 8576:2013 stress the need for risk assessments to be based on good quality data and give guidance as to best practice in this respect.

Review of Data Quality			
Data Type	Current Understanding	UK Practice	Recommendation
Geological and hydro-geological conditions	The CSM identified the site to be located on limited Made Ground (1.01m- 2.20m), overlying the superficial Kempton Park Gravel Member underlain by the London Clay Formation. No Groundwater was encountered during the intrusive investigation.	CIRA C665 & C659, Wilson and Card (1999) and BS 8485 recommend that geology and hydrogeology be fully understood.	The geological and hydrogeological model is understood to a standard that will not compromise the findings of the risk assessment. No further action required.
Soil Laboratory Analysis	A dataset of soil analysis from 3No. samples of Made Ground have identified a range of TOC concentrations between 0.586% - 1.55%.	CL:AIRE RB17 outlines an approach to ground gas risk assessment away from the influences that directly affect ground gas monitoring. It should typically be used on sites with limited sources identified in the CSM and Made Ground with average thickness <3m and maximum thickness <5m. TOC should be < 6%.	The TOC concentrations are below the limit of 6% in order to use the soil derived approach for the risk assessment. No further action required.

5.5.3. Risk Assessment

The intrusive investigation has revealed a maximum thickness of Made Ground of 2.20m overlying Kempton Park Gravel Member comprising cohesive and granular soils. Site has undergone a previous phase of construction and limited degradable material has been identified. The introduction of oxygen to the Made Ground through redevelopment may lead to an initial increase of ground gas generation as degradable material within the soils present on-site may act as source of ground gas. The soils at the site are considered to be of variable permeability (low to high) in nature and pathways for ground gas migration will be present.

Using the soil derived method, it is considered that a TOC value of <1% within soil is unlikely to pose an unacceptable risk from ground gases and the site can be characterised as Characteristic Situation CS1. Any value over 6% requires investigation through ground gas monitoring. Any site with Made Ground <2.00m bgl will have a limited gas generation potential from the organic carbon present and consideration should be given to this thickness within the risk assessment. Given the maximum thickness of Made Ground was 2.20m bgl in one location only, the remaining boreholes had <2.00m and the material recorded within the Made Ground it is unlikely to generate sufficient concentrations of gases to warrant protection measures.

An alternative approach for ground gas risk assessment (CL:AIRE RB17) can be considered utilising measured concentrations from soil parameters that are independent of influencing factors such as atmospheric pressure and groundwater level. Total Organic Carbon (TOC) was tested on 3No. samples with the analytical results ranging between 0.586% - 1.55%. One recording was marginally over the required 1.5%, however, the thickness of the borehole recorded was 1.50m bgl, therefore, it was not considered to generate sufficient ground gases to pose an unacceptable risk.

Based on the soil derived method outlined and the maximum TOC concentration encountered, the soils from site would warrant classification as **Characteristic Situation CS1**. It should be noted that this only represents the assessment from an on-site source.

5.5.4. Ground Gas Risk Assessment Summary

One method of ground gas risk assessment has been applied to the site following site investigation comprising a review of organic content of soils.

Based on the evidence available to date, the risk assessment for the site indicates that the site should be classified as **Characteristic Situation CS1**.

The gas protection methods are outlined in BS8485:2015+A1:2019 and should be installed in line with CIRIA C735. The protection measures required are summarised within Section 5.8.

5.6. Updated Conceptual Site Model

Following completion of the Phase 2 Site Investigation, the CSM, inclusive of associated risk, within Section 2.8 of this report was re-evaluated.

For ease of reference and understanding, the risks have been re-assigned within this risk assessment against three possible levels / categories, summarised in the table below.

Risk Categories used in the Tabulated CSM	
Low Risk	Regarding this potential SPR linkage, the site is considered suitable for the proposed end-use and there is not considered to be an unacceptable risk to receptors.
Moderate Risk	Regarding this potential SPR linkage, the site is suitable for the proposed end-use however remediation and/or further investigation is required.
High Risk	Regarding this potential SPR linkage, the site is not suitable for proposed end-use and there is an unacceptable risk to receptors. Urgent action required in the short term.

Tabulated Conceptual Site Model – Pollutant Linkage Summary			
Potential Sources	Linkage	Potential Receptors	Risk Classification
Human Health			
Dust and surface runoff from construction materials storage, stockpiled soils and bare earth surfaces during construction	Dermal contact, inhalation and ingestion.	Offsite residents/users; construction worker	Low
Shallow ground contamination from former activities on site and surrounding land uses	Dermal contact, inhalation and ingestion.	Construction workers	Low
Property			
Shallow ground contamination from former activities onsite and surrounding land uses	Contact with building foundations and buried services	Future on-site structures	Low
Ground gas and vapour emissions.	Ingress into confined spaces within buildings	Future on-site receptors	Low
Ecological systems			
Shallow ground contamination from former activities on-site and surrounding land – uses	Lateral migration of ground contamination to soil	Future onsite and off-site receptors and residents	Low
Controlled waters			
Contamination from former activities on-site and surrounding land – uses	Leaching of ground contamination to groundwater	Secondary A aquifer in the Kempton Park Gravel Member	Low

6. CONTAMINATION RECOMMENDATIONS AND REMEDIATION STRATEGY

Based on the results of the intrusive works, chemical analyses and risk assessments undertaken, the following has been identified that requires further action:

An Asbestos Management Strategy should be put in place so that any potentially asbestos containing materials are identified and removed from site in a suitable manner to prevent cross-contamination.

6.1. Soils

The comparison between the laboratory analysis revealed no elevated levels of determinands in the samples tested were in excess of the 'Residential without home-grown produce' land-use scenario adopted. The determinands tested were identified at below the adopted screening value and are not considered to represent an unacceptable risk to future receptors. Should the proposed development change post reporting date of September 2022, then further assessment should be undertaken and the adopted land-use scenario may require altering to be representative of the updated proposed end-use.

6.2. Groundwater

Given the Level 1 risk assessment does not consider dilution, dispersion or attenuation, and the conceptual site model shows the nearest receptor to be The Mosell ~350m southwest of the site, it is not expected that the soils on-site represent an unacceptable risk to controlled water receptors. No further action is considered necessary.

The findings of this risk assessment should be agreed with the Environment Agency.

6.3. Ground Gas and Vapours

Based on the soil derived method outlined and the maximum TOC concentration encountered, the site warranted classification as Characteristic Situation CS1. It should be noted that this only represents the assessment from an on-site source. No remedial actions are required. The risk from vapours was considered to be low due to the minimal concentrations of BTEX compounds (Benzene, Toluene, Ethylbenzene, Xylene) and MTBE – which are used as marker compounds for Volatile Organic Compounds (VOCs).

6.4. Discovery Strategy

There may be areas of contamination that have not been identified during the course of the intrusive investigation (e.g. underground storage tanks). Such occurrences may be discovered during the construction phases for the redevelopment of the site.

Groundworkers should be instructed to report to the Site Manager any evidence for such contamination; this may comprise visual indicators, such as fibrous materials within the soil, discolouration, or odours and emission. Upon discovery advice must be taken from a suitably qualified person and then the Local Authority will need to be informed.

6.5. Imported Material

It is not envisaged that soils will be brought onto site as part of the development works, however, any soil which is to be imported onto the site must undergo chemical analysis to prove that it is suitable for the purpose for which it is intended.

The soil must be fit for purpose and must either be supplied with traceable chemical laboratory test certificates or be tested, prior to placing (ideally) and after placing, to ensure that the future receptors (human health and vegetation) cannot come into contact with compounds that could be detrimental to their health. The compounds that are to be tested for are those given in the Generic Assessment Criteria, which can be viewed in Appendix E of this report.

6.6. Waste Disposal

The excavation of foundations and other soils is likely to produce waste which will require classification and then recycling or removal from site.

Under the Landfill (England and Wales) Regulations 2002 (as amended), prior to disposal, all waste must be classified as either: Inert; Non-hazardous; or Hazardous.

The Environment Agency's Hazardous Waste Technical Guidance (WM3) document outlines the methodology for classifying wastes. Once classified the waste can be removed to the appropriately licensed facilities, with some waste requiring pre-treatments prior to disposal.

Following the investigation, 3No. samples of Made Ground were submitted to the analytical laboratory to undergo a suite of testing for contamination testing, as discussed in the previous sections. Sampling depths were chosen to reflect the receptor of concern, human health, and typically comprised a surface or near surface sample and periodically to 1.00m bgl. Any horizon where olfactory or visual evidence of contamination was present was also sampled.

Based on a risk phase analysis of the chemical laboratory test results, in accordance with EC Hazardous Waste Directive and undertaken by Ground and Water Limited, all soil samples of Made Ground encountered on-site were NON-HAZARDOUS. The results of the assessment are given within Appendix G.

It is important to note that whilst we consider our in-house assessment tool to be an accurate interpretation of the requirements of WM3, therefore producing an initial classification in accordance with the guidance, this method classifies soils as either non-hazardous or hazardous and landfill operators have their own assessment tools and can often come to different conclusions. As a result, some landfill operators could refuse to take apparently suitable waste. It is recommended that the receiving landfill views the results of this assessment and the chemical laboratory results to determine their own classification.

In addition to the samples described above, 1No. sample of Made Ground was scheduled to undergo Waste Acceptance Criteria (WAC) testing with single batch leachate from samples with a range of depths. The results indicate that 1No. samples conformed to the Inert Waste Classification.

Where contaminated soils are to be removed, they should be placed on an impermeable membrane (visqueen or similar) to ensure that no cross-contamination of soils occurs.

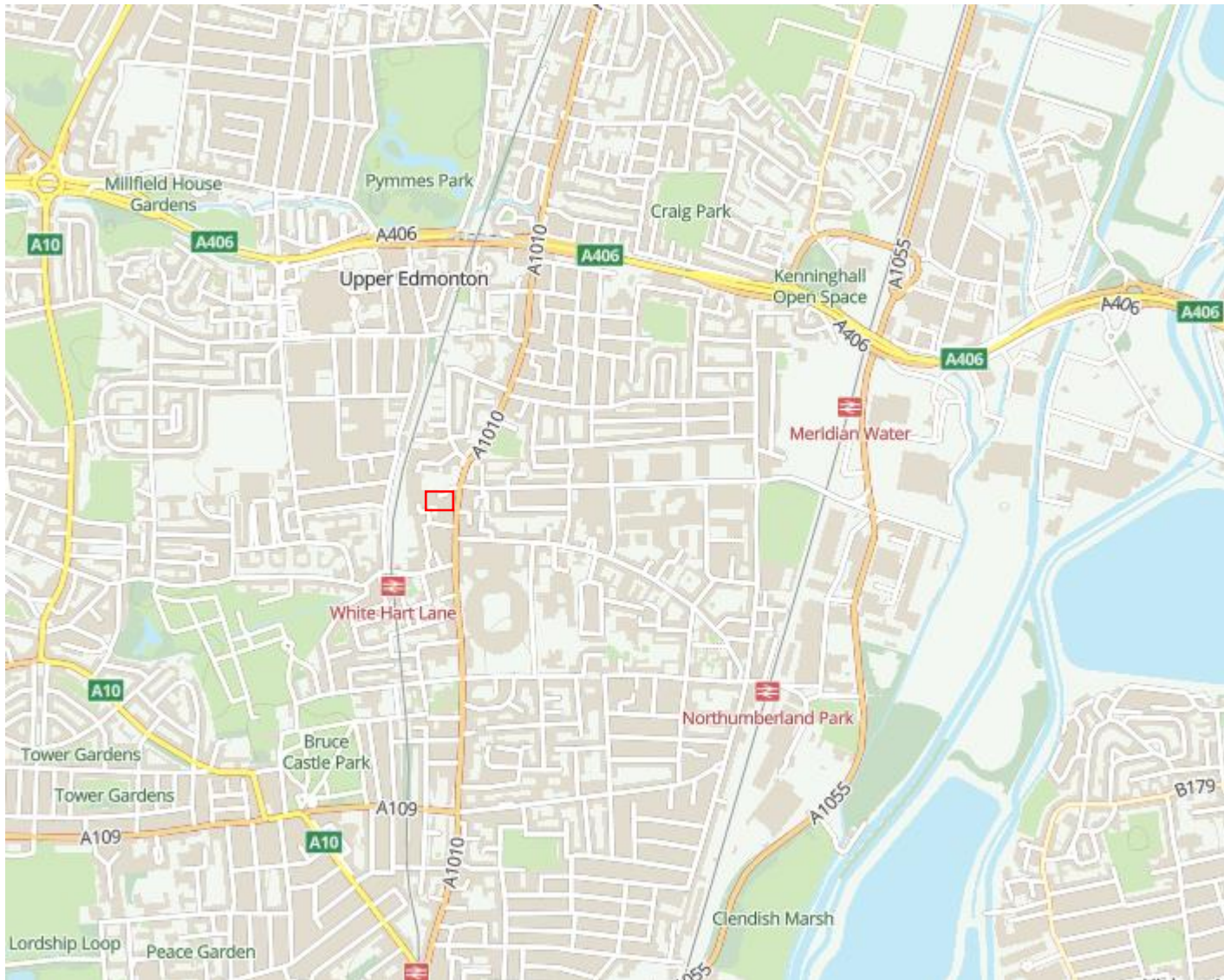
6.7. Duty of Care

Groundworkers must maintain a good standard of personal hygiene including the wearing of overalls, boots, gloves and eye protectors and the use of dust masks during periods of dry weather.

To prevent exposure to airborne dust by both the general public and construction personnel the site should be kept damp during dry weather and at other times when dust would be generated as a result of construction activities.

The site should be securely fenced at all times to prevent unauthorised access. Washing facilities should be provided and eating restricted to mess huts.

FIGURES



Site Development Area

NTS

807 High Road, Tottenham, London N17 8ER

F3 Architects LLP

September 2022

Figure 1 – Site Location Plan

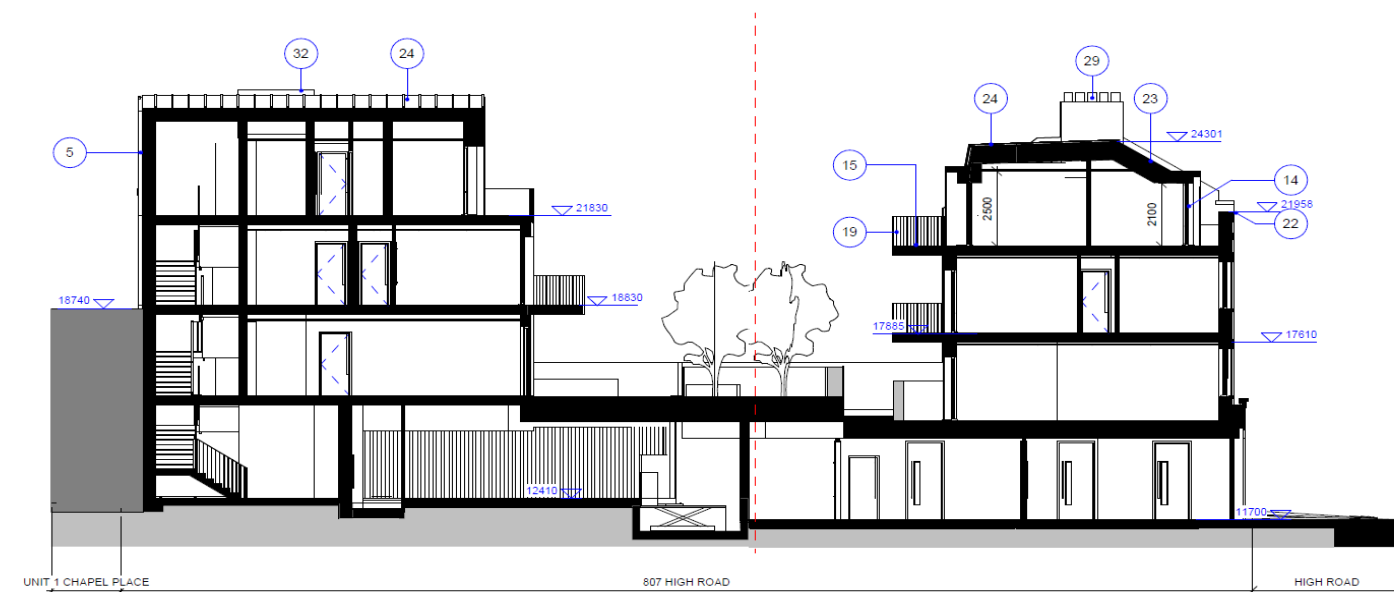
GWPR4898



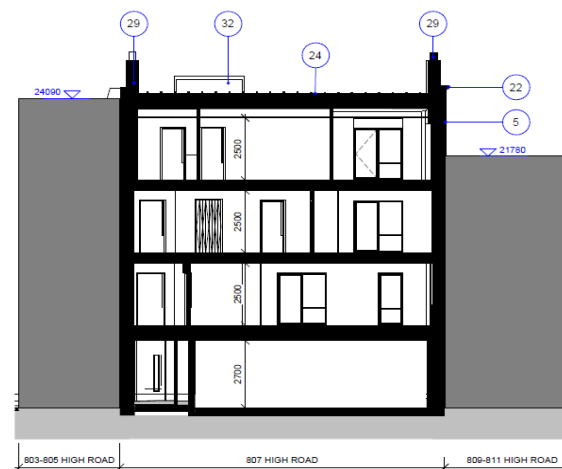


Site Boundary

NTS



Proposed Section 1
SCALE 1 : 100



Proposed Section 2

807 High Road, Tottenham, London N17 8ER

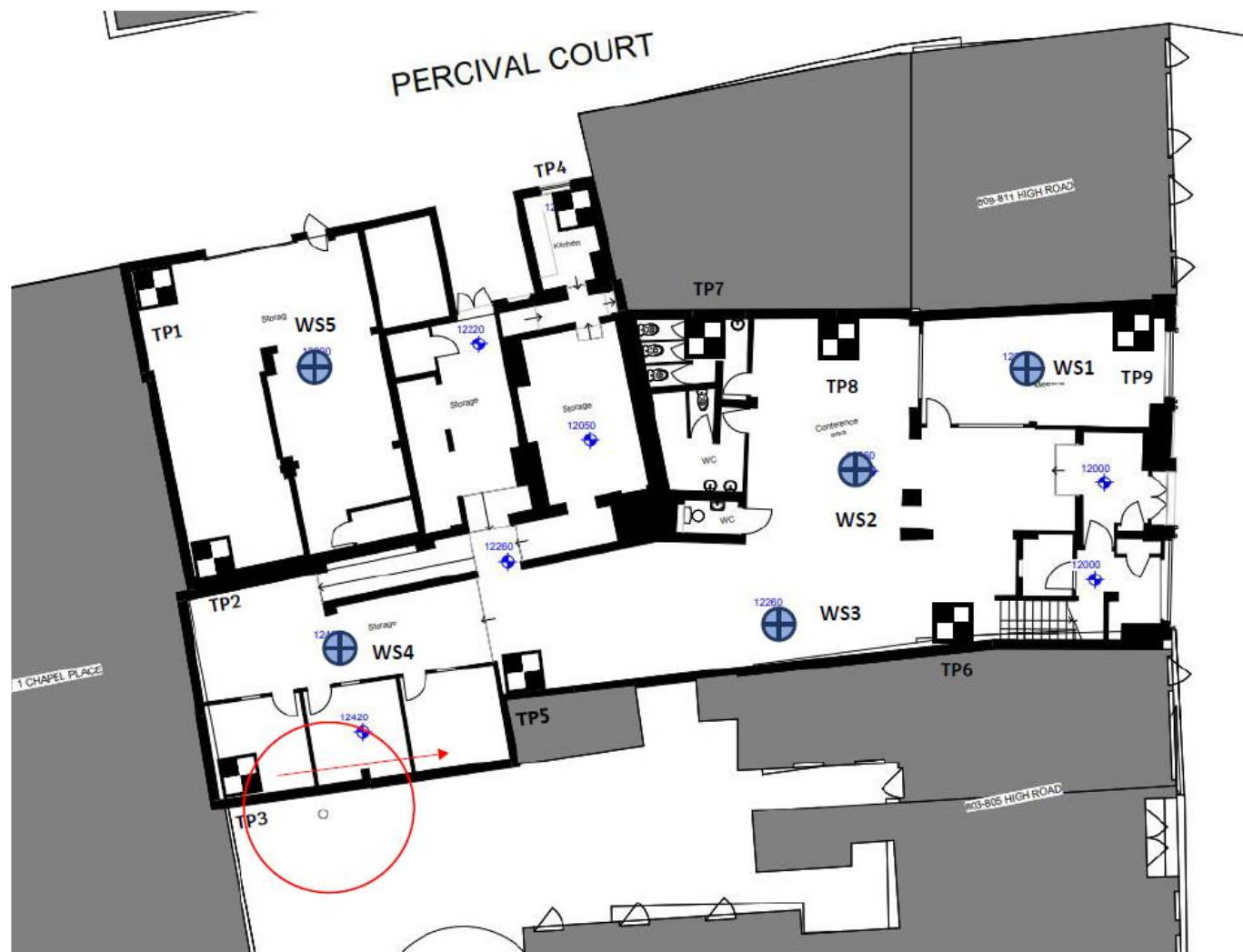
F3 Architects LLP

September 2022

Figure 2 – Proposed development plan

GWPR4898





Site Boundary

Windowless Sampler Borehole

Indicates location of 1m x 1m trial pit - depth to match underside of existing foundations

TP

NTS

807 High Road, Tottenham, London N17 8ER

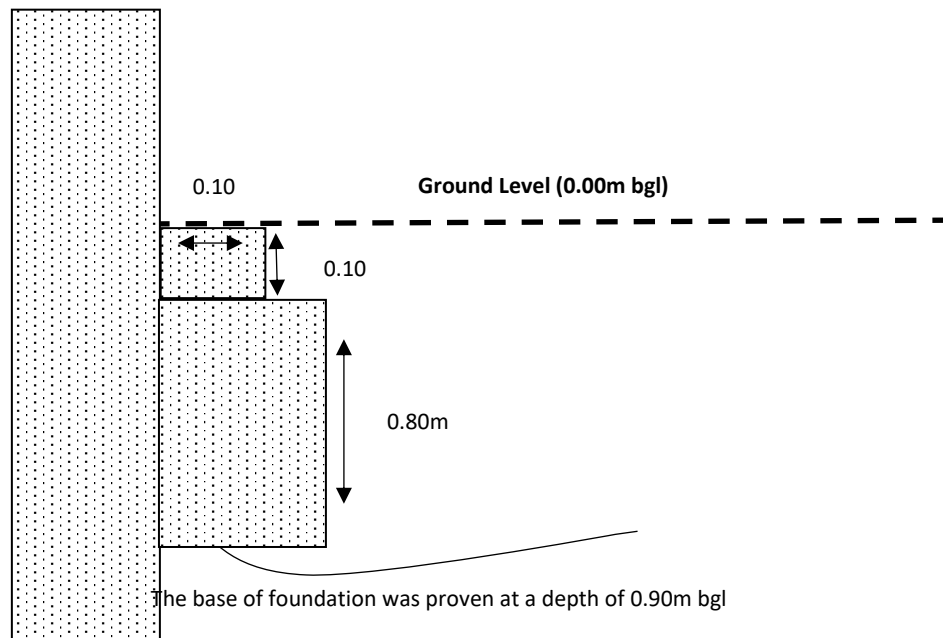
F3 Architects LLP

September 2022

Figure 3 – Trial Hole Location Plan

GWPR4898





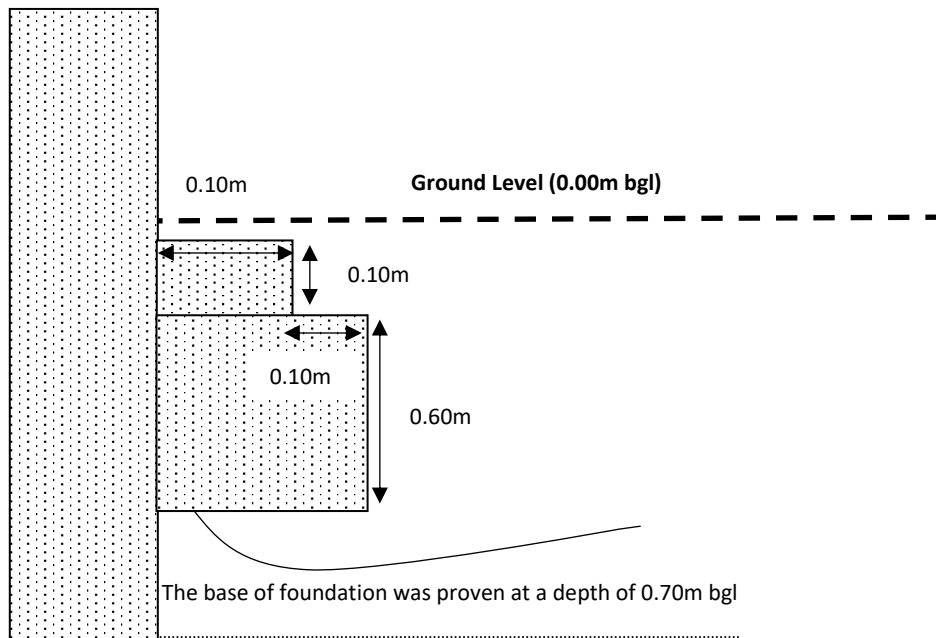
807 High Road, Tottenham, London N17 8ER

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Figure 4 – TP/FE1

GWPR4898



NOT TO SCALE

807 High Road, Tottenham, London N17 8ER

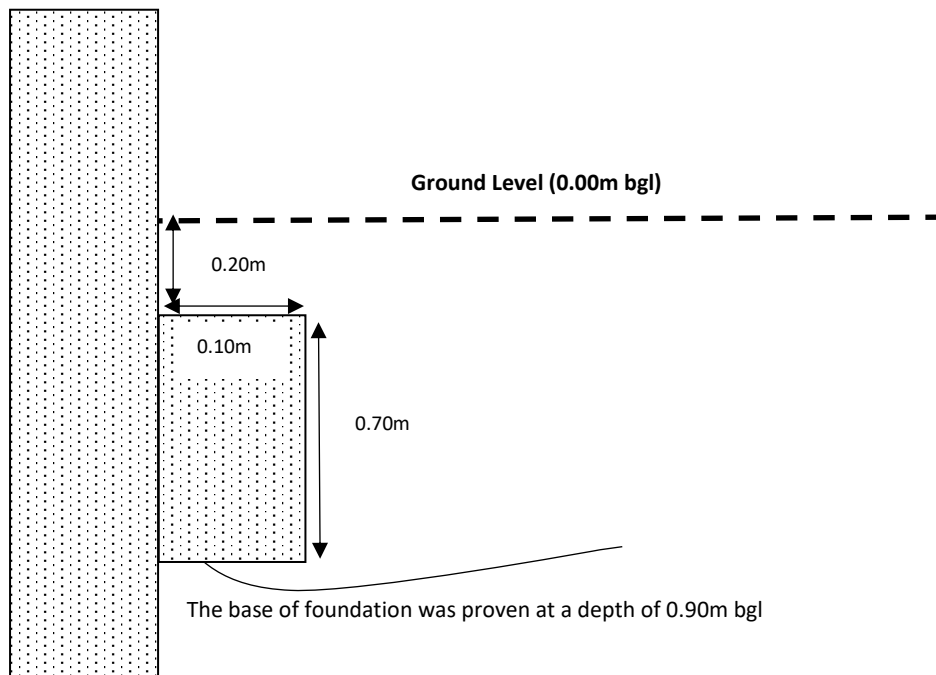
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Figure 5 – TP/FE2

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 Concrete

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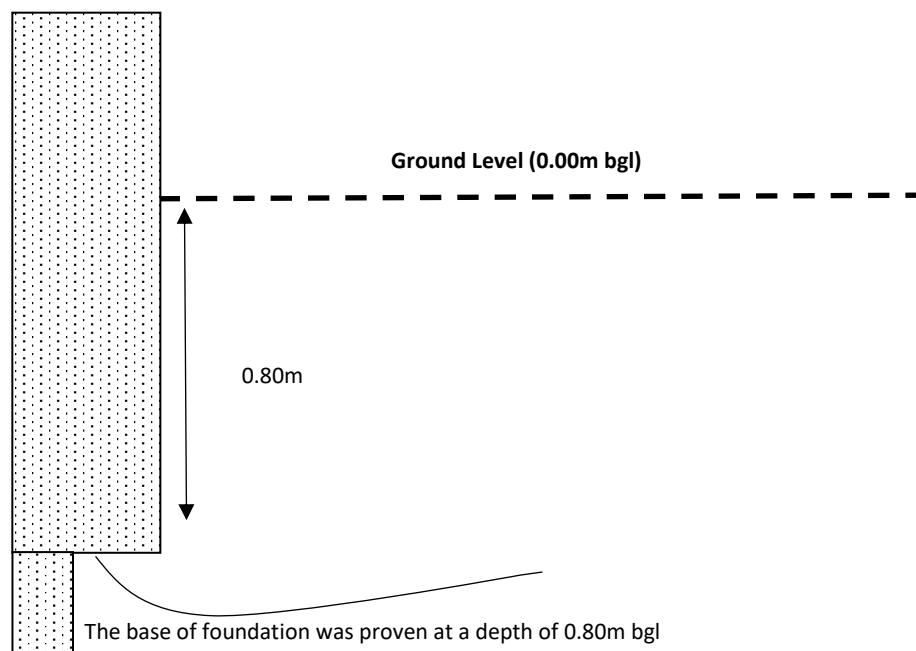
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Figure 6 – TP/FE3

GWPR4898


ground&water
NOT TO SCALE



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807 High Road, Tottenham, London N17 8ER

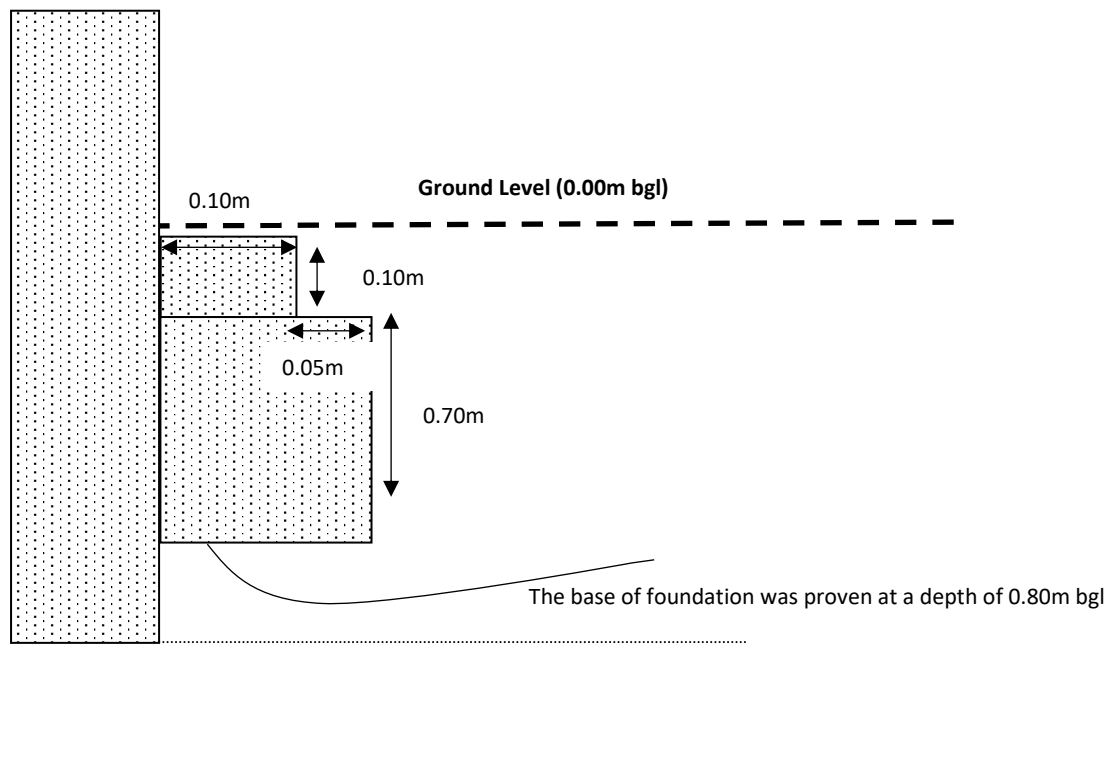
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Figure 9 – TP/FE5

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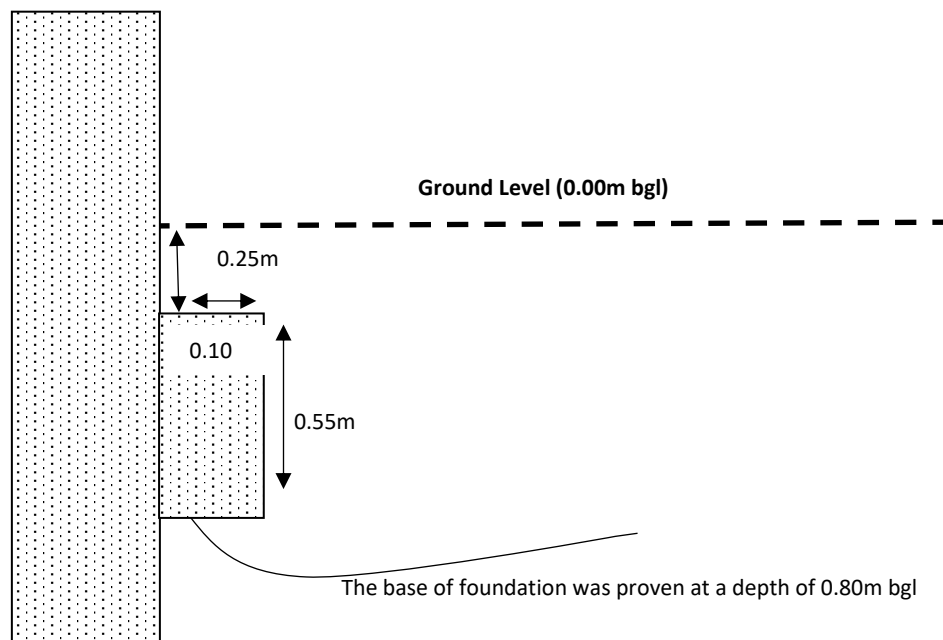
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Figure 10 - TP/FE6

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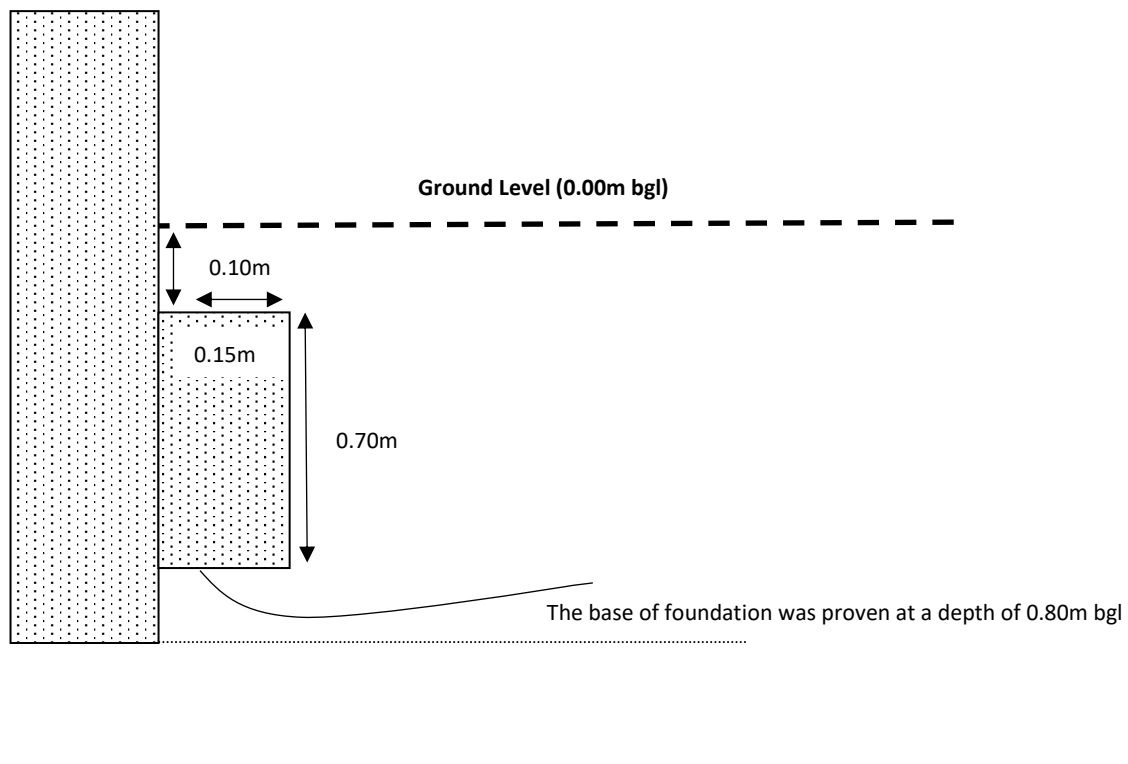
F3 Architects LLP

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Figure 11 –TP/ FE7

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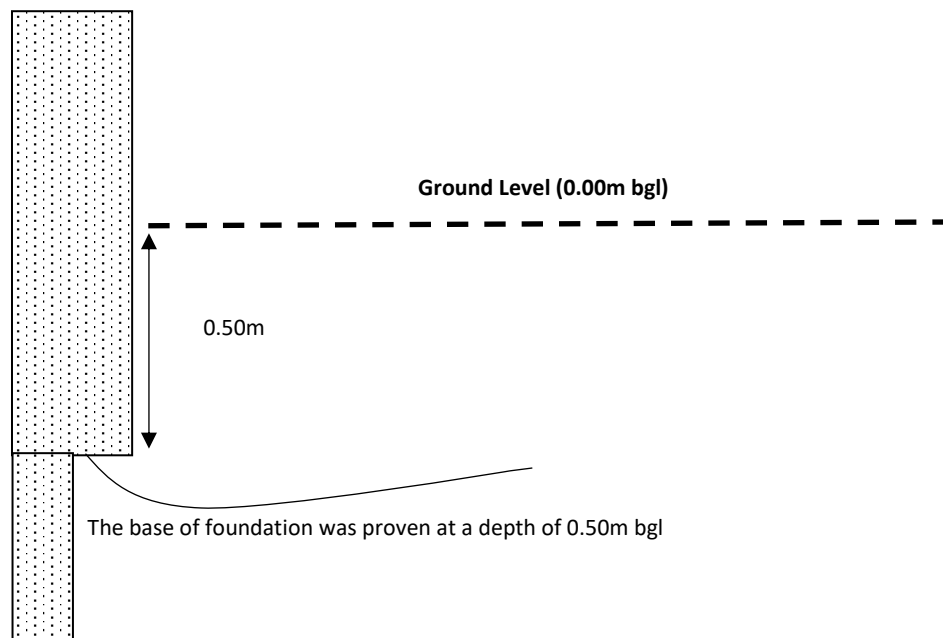
F3 Architects LLP

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Figure 12 – TP/FE8

GWPR4898





 Concrete

807 High Road, Tottenham, London N17 8ER

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Figure 13 – TP/FE9

GWPR4898


ground&water
NOT TO SCALE

APPENDIX A: Conditions and Limitations

The ground is a product of continuing natural and artificial processes. As a result, the ground will exhibit a variety of characteristics that vary from place to place across a site, and also with time. Whilst a ground investigation will mitigate to a greater or lesser degree against the resulting risk from variation, the risks cannot be eliminated.

The report has been prepared on the basis of information, data and materials which were available at the time of writing. Accordingly, any conclusions, opinions or judgements made in the report should not be regarded as definitive or relied upon to the exclusion of other information, opinions and judgements.

The investigation, interpretations, and recommendations given in this report were prepared for the sole benefit of the client in accordance with their brief; as such these do not necessarily address all aspects of ground behaviour at the site. No liability is accepted for any reliance placed on it by others unless specifically agreed in writing.

Any decisions made by you, or by any organisation, agency or person who has read, received or been provided with information contained in the report ("you" or "the Recipient") are decisions of the Recipient and we will not make, or be deemed to make, any decisions on behalf of any Recipient. We will not be liable for the consequences of any such decisions.

Current regulations and good practice were used in the preparation of this report. An appropriately qualified person must review the recommendations given in this report at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

Any Recipient must take into account any other factors apart from the Report of which they and their experts and advisers are or should be aware. The information, data, conclusions, opinions and judgements set out in the report may relate to certain contexts and may not be suitable in other contexts. It is your responsibility to ensure that you do not use the information we provide in the wrong context.

This report is based on readily available geological records, the recorded physical investigation, the strata observed in the works, together with the results of completed site and laboratory tests. Whilst skill and care has been taken to interpret these conditions likely between or below investigation points, the possibility of other characteristics not revealed cannot be discounted, for which no liability can be accepted. The impact of our assessment on other aspects of the development required evaluation by other involved parties.

The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous in ground activities. The ground conditions have been sampled or monitored in recorded locations and tests for some of the more common chemicals generally expected. Other concentrations of types of chemicals may exist.

The conclusions and recommendations relate to 807 High Road, Tottenham, London, N17 8ER.

Trial hole is a generic term used to describe a method of direct investigation. The term trial pit, borehole or window sampler borehole implies the specific technique used to produce a trial hole.

The depth to roots and/or of desiccation may vary from that found during the investigation. The client is responsible for establishing the depth to roots and/or of desiccation on a plot-by-plot basis prior to the construction of foundations. Where trees are mentioned in the text this means existing trees, recently removed trees (approximately 15 years to full recovery on cohesive soils) and those planned as part of the site landscaping.

Ownership of copyright of all printed material including reports, laboratory test results, trial pit and borehole log sheets, including drillers log sheets, remain with Ground and Water Limited. Licence is for the sole use of the client and may not be assigned, transferred or given to a third party.

Only our client may rely on this report and should this report or any information contained in it be provided to any third party we accept no responsibility to the third party for the contents of this report save to the extent expressly outlined by us in writing in a reliance letter addressed from us to the third party.

Recipients are not permitted to publish this report outside of their organisation without our express written consent.

APPENDIX B:

Technical Glossary

TECHNICAL GLOSSARY

The list of possible definitions within the report may be seen below. Please note that some definitions may not be relevant to this report.

HYDROGEOLOGY:

A **Principal Aquifer** is a layer of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

Secondary (A) Aquifers consist of deposits with permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as Minor Aquifers.

Secondary (B) Aquifers consist of deposits with predominantly lower permeability layers with may stoke and yield limited amounts of groundwater due to localised features such as fissures, think permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.

Secondary Aquifers (Undifferentiated) are assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both a minor aquifer and non-aquifer in different locations due to the variable characteristics of the rock type.

Unproductive Strata are rock layers with low permeability that have negligible significance for water supply or river base flow. These were formerly classified as non-aquifers.

FLOOD ZONES:

Environment Agency Flood Zone 2, defined as; land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.

Environment Agency Flood Zone 3 shows the extent of a river flood with a 1 in 100 (1% or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year.

Environment Agency Flood Zone 3 area that benefits from flood defences, defined as; land and property in this flood zone would have a high probability of flooding without the local flood defences. These protect the area against a river flood with a 1% chance of happening each year, or a flood from the sea with a 0.5% chance of happening each year.

GROUNDWATER SOURCE PROTECTION ZONES (SPZS):

Inner Zone (SPZ1): This zone is 50 day travel time of pollutant to source with a 50 metres default minimum radius.

Outer Zone (SPZ2): This zone is 400 day travel time of pollutant to source. This has a 250 or 500 metres minimum radius around the source depending on the amount of water taken.

Total Catchment (SPZ3): This is the area around a supply source within which all the groundwater ends up at the abstraction point. This is the point from where the water is taken. This could extend some distance from the source point.

Zone of Special Interest (SPZ4): This zone is where local conditions require additional protection.

IN-SITU STRENGTH GEOTECHNICAL TESTING:

Windowless Sample and/or Cable Percussion and/or Rotary Boreholes provide samples of the ground for assessment but they do not give any engineering data. The standard penetration test (SPT) is an in-situ dynamic penetration test designed to provide information on the geotechnical engineering properties of soil. The test uses a thick-walled sample tube, with an outside diameter of 50mm and an inside diameter of 35mm, and a length of around 650mm. This is driven into the ground at the bottom of a borehole by blows from a slide hammer with a weight of 63.5kg falling through a distance of 760mm. The sample tube is driven 150mm into the ground and then the number of blows needed for the tube to penetrate each 75mm up to a depth of 450mm is recorded. The sum of the number of blows is termed the "standard penetration resistance" or the "N-value".

Dynamic Probing involves the driving of a metal cone into the ground via a series of steel rods. These rods are driven from the surface by a hammer system that lifts and drops a 63.5kg (SHDP) hammer onto the top of the rods through a set height, thus ensuring a consistent energy input. The number of hammer blows that are required to drive the cone down by each 100mm increment are recorded. These blow counts then provide a comparative assessment from which correlations have been published, based on dynamic energy, which permits engineering parameters to be generated. (The Dynamic Probe 'Super Heavy' (SHDP) Tests were conducted in accordance with BS 1377; 1990; Part 9, Clause 3.2).

APPENDIX C:

Previous

Preliminary Risk

Assessment



Preliminary Risk Assessment

807 High Road, Tottenham, London

March 2020

Waterman Infrastructure & Environment Ltd

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Client Name: Tottenham Hotspur Football Club
Document Reference: WIE16362-101-R-1.2.1-PRA
Project Number: WIE16362

Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS EN ISO 45001:2018)

Issue	Date	Prepared by	Checked by	Approved by
1.1.3	December 2019	Janki Patel	Robbie J Moore	Carl Slater
1.2.1	March 2020	Janki Patel	Jon Coates	Carl Slater



Comments

Disclaimer

This report has been prepared by Waterman Infrastructure & Environment Limited, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporation of our General Terms and Condition of Business and taking account of the resources devoted to us by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.

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Contents

Executive Summary

Objectives

Preliminary Environmental Risk Assessment for ground contamination to support a planning application for the proposed redevelopment at 807 High Road, Tottenham, London, N17 8ER.

Site Setting

Current Use	Staff training offices and storage/ vacant building
History	Residential or commercial use.
Geology	Hardstanding underlain by Made Ground, then 2.5 – 5m Kempton Park Gravel Member and London Clay Formation underlying, extending to at least 20m thickness.
Controlled Waters	Kempton Park Gravel Member is classified as a Secondary A Aquifer and the London Clay Formation an Unproductive Stratum.
Consultation	A Groundsure Insight dataset was procured for the Site. Information was requested from Environmental Health and Building Control departments at the London Borough of Haringey and the Petroleum Enforcing Authority of the London Fire Brigade. The London Borough of Haringey's online planning register was accessed.

Preliminary Conceptual Model

The following potential contaminant linkages are identified on-Site:

- Existing off-Site residents/users contacting ground contamination via surface runoff or dust generated during construction works; and
- Construction workers contacting ground contamination or dust through material handling during the works.

Conclusions

Given the proposed end use, the overall risk rating for the Site is assessed as **low**.

Given the Site history and the proposed development intrusive investigation to further quantify the contamination status of the Site is not required.

Recommendations

- A watching brief by experience personnel should be carried out during the construction for the presence of unforeseen contamination and greater deposits of made ground than previously anticipated. Should unforeseen contamination be encountered, works in the area of the contamination should be halted and the advice of an environmental consultant sought. The Environmental Health Officer will be informed of the contamination and remedial measures to be carried out to break identified contamination receptors;
- Construction workers should be provided with personal protective equipment (PPE), and informed of good hygiene measures as protection against direct contact with contaminated soils, dust inhalation, ground gas and vapours;
- A Construction Environmental Management Plan (CEMP) should be prepared for the Site, including measures to minimise runoff from stockpiled soils and to suppress the generation of dust;
- Construction materials brought on-Site as part of works should be appropriately stored to prevent spills and leaks; and
- Buried structures and services at the completed development should be suitably designed to resist chemical attack.

1. Introduction

1.1 Objectives

F3 Architects LLP instructed Waterman Infrastructure & Environment Limited (“Waterman”) to undertake a Preliminary Risk Assessment (PRA) for ground contamination to support a planning application for the proposed redevelopment of 807 High Road, Tottenham, London, N17 8ER (hereafter termed “the Site”).

1.2 Proposed Development

The Site is currently used for staff and steward training. The floors above were used as residential then as offices and are not in use currently. The rear of the property comprises a single-storey structure used as a storage facility. The access to the storage room can be gained via Percival Court.

The development comprises demolition of existing buildings; the erection of a replacement building up to four storeys to include residential (C3), retail (A1) and flexible D1/B1 uses; hard and soft landscaping works including a residential podium; and associated works.

1.3 Regulatory Context

The National Planning Policy Framework (NPPF) 2019 sets out Government planning policy for England and how this is expected to be applied to development. Paragraph 118 of Section 11 – Making effective use of land and paragraphs 170, 178, 179 and 183 of Section 15 – Conserving and enhancing the natural environment of the NPPF relate to contaminated land matters and state the following:

118. Planning policies and decisions should:

c) give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land;

170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

178. Planning policies and decisions should ensure that:

a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);

b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and

c) adequate site investigation information, prepared by a competent person, is available to inform these assessments.

179. Where a site is affected by contamination or land stability issues, responsibility for securing a safe

development rests with the developer and/or landowner.

183. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.

In order to assess the contamination status of the Site, with respect to the proposed end use, it is necessary to assess whether the Site could potentially be classified as “Contaminated Land”, as defined in Part IIA of the Environmental Protection Act 1990 and Contaminated Land Statutory Guidance 2012. This is assessed by the identification and assessment of potential pollutant linkages. The linkage between the potential sources and potential receptors identified needs to be established and evaluated.

To fall within this definition, it is necessary that, as a result of the condition of the land, substances may be present in, on or under the land such that:

- a) significant harm is being caused or there is a significant possibility of such harm being caused; or
- b) significant pollution of controlled waters is being caused, or there is significant possibility of such pollution being caused.

It should be noted that DEFRA has advised (Ref. Section 4, DEFRA Contaminated Land Statutory Guidance 2012) Local Authorities that land should not be designated as “Contaminated Land” where:

- a) the relevant substance(s) are already present in controlled waters;
- b) entry into controlled waters of the substance(s) from land has ceased; and
- c) it is not likely that that further entry will take place.

These exclusions do not necessarily preclude regulatory action under the Environmental Permitting (England and Wales) Regulations 2016, which make it a criminal offence to cause or knowingly permit a water discharge of any poisonous, noxious or polluting matter to controlled waters. In England and Wales, under The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009, a works notice may be served by the regulator requiring appropriate investigation and clean-up.

1.4 Limitations and Constraints

The assessment was undertaken in accordance with the scope agreed between Waterman and F3 Architects, as documented in Waterman’s fee letter (WIE16362-100-20191002-JC-Fee, dated 2nd October 2019), and with Waterman’s standard Terms of Appointment.

The benefit of this report is made to Tottenham Hotspur Football Club.

The information contained in this report is based on a review of available historical, geological and hydrogeological sources, consultation with the regulatory authorities and observations made on-Site on 12 December 2019. Waterman has endeavoured to assess all information provided to them during this investigation but makes no guarantees or warranties as to the accuracy or completeness of this information.

The scope of this investigation does not include an assessment for the presence of asbestos containing materials within or below buildings or in the ground at the Site. The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the Site.

2. Methodology

This Preliminary Environmental Risk Assessment has been undertaken in general accordance with the Land Contamination: Risk Management Guidance (LCRM: Environment Agency, 5 June 2019).

The report includes the following:

- Definition of overall Site objectives
- collation of available current and historical information about the Site and the potential contaminants expected to be present;
- a Site reconnaissance;
- formulation of an outline Conceptual Model;
- qualitative risk assessment; and
- record of findings and recommendations for further action.

3. Hazard Identification

3.1 Site Description and Reconnaissance

The Site covers 585m² and is located at National Grid Reference 533846, 191455 on High Road (A1010), London. The Site is bounded to the north by a retail unit, to the east by A1010 High Road, to the south by The Bricklayers public house and to the west by a large storage/warehouse unit. The large warehouse unit contains car repair and servicing garages.

Figure 1: Current Site Layout



Source: Site boundary (Enviro Insight Report, ref: WTM1-6500720)

The Site comprises a ground floor area, two storeys at the east of the property and one storey to the west. The ground floor area is used for staff and steward training. During the Site walkover, only the ground floor was accessed. A drainage cover situated on the ground floor was observed. The floors above are not in use and access is blocked to the upper floors. The Site does not have a basement.

A storage room containing retail merchandise is at the rear of the Site, accessed via Percival Court. The storage area was previously used for car repair servicing. No staining of the ground was observed as the area is lined with plastic sheeting. A drain runs through the storage area and a drainage cover is located near the entrance. Drainage is also located alongside the rear of the property at Percival Court. Drainage

covers appeared in good condition, with no standing water observed on hardstanding.

Site location and Site layout plans are presented as Appendix A. A selection of photographs taken during the Site inspection is presented as Appendix B.

No current potentially contaminative Site uses were identified during the property inspection.

3.1.1 Licences and Consents

The following Pollution, Prevention and Control licenses, discharge consents, licensed waste management facilities and registered radioactive substances are now covered by Environmental Permits (EPs);

- Integrated Pollution, Prevention and Controls (IPPC): Environmental Permit for a Part A(1) Activity
- Local Authority IPPC (LA-IPPC): Environmental Permit for a Part A(2) Activity
- Local Authority Pollution, Prevention and Controls (LAPPC): Environmental Permit for a Part B Activity
- Licensed Waste Management Facilities: Environmental Permit for waste activities
- Registered Radioactive Substances: Environmental Permit relating to radioactive substances
- Discharge Consents: Environmental Permit for discharges to groundwater/surface water

According to the Enviro Insight report, presented in Appendix C, there are no licences or consents registered to the property.

3.1.2 Site Surroundings

A summary of the current surrounding land uses, including relevant licences and consents within 500m of Site, is shown in Table 1.

Table 1: Summary of Surrounding Land Uses

Location	Description
North	Retail and industrial units and residential housing.
East	High Road (A1010), shops and Tottenham Hotspur Stadium.
South	Shops and residential housing. Single EP for a Part B activity, registered to a dry cleaners 64m south
West	Industrial units, scrap yard, railway line and residential housing.

3.2 History

A review of historical maps obtained from Groundsure Insight has been undertaken. Table 2 summarises the relevant information within 500m of the Site.

Table 2: Pertinent Site History

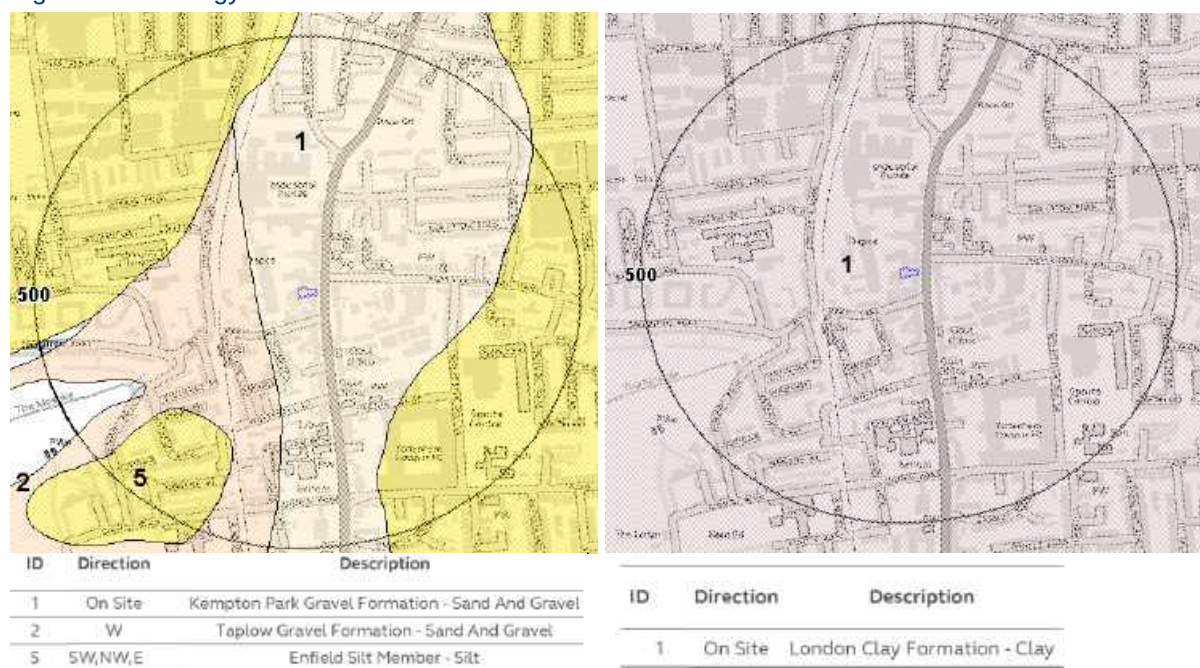
Date (decade)	Feature	On-Site/distance off-site
1864	Residential or commercial use (6 blocks) Brunswick brewery	On-Site 80m northwest
1894	Enfield Branch Railway line and White Hart Lane station	158m west off-Site
1896	Terraced housing Smithy and yard Tramway on the High Road	On-Site On-Site 10m east off-Site
1913	Smithy no longer listed Train depot for goods and coal	On-Site 100m west off-Site
1935	No change Warehouse Furniture manufactory Precision machinery manufacturer Dye works - hides and skins	On-Site 50m west off-Site 115m northwest off-Site 155m east off-Site 290m northeast off-Site
1955 – 1956	4 blocks of residential terraced housing Laundry Tramway dismantled The Herald Printing works Trading estate Unspecified tank Nesta Furniture Works Engineering works Imperial Engineering works Road Haulage depot Electrical substation	On-Site 60m southwest off-Site 10m east off-Site 35m north off-Site 185m southeast off-Site 175m southeast off-Site 110m northwest off-Site 130m east and 200m southeast off-Site 150m southwest off-Site 240m north off-Site 200m northeast off-Site
1956	No change	On-Site & off-Site
1964 – 1967	2 blocks of residential or commercial use Warehouse developed into paint box and paper bag factory Works Garage	On-Site 50m west off-Site 150m northeast off-Site 120m south off-Site
1970 – 1974	No change 3 Electrical substations Warehouse Rubberware factory	On-Site 128m southeast, 128m east & 152m south off-Site 170m southeast off-Site 230m north off-Site
1974 – 1977	No change Electrical substation	On-Site 100m northwest off-Site
1983	No change	On-Site

Date (decade)	Feature	On-Site/distance off-site
	Unspecified tanks	27m west off-Site
	Builder's and scrap yard	190m west off-Site
1981 – 1986	No change	On-Site
	Electrical substations	98m northwest & 160m north off-Site
1991	No change	On-Site
1991 – 1992	Paint box and paper bag factory developed into industrial warehouse	50m west off-Site
	The Herald Printing works developed into builder's yard	35m north off-Site
2003 – 2019	No change	On-Site

3.3 Geology

The geology beneath the Site has been established from the British Geological Survey (BGS) 1:50,000 scale Geological Map, Sheet 256 'North London'; 'Bedrock and Superficial', and BGS borehole logs <500m away from Site (Ref: BHO_804317, BHO_804149 and BHO_803913) from the BGS website (accessed online 05/12/2019). Geology is shown in Figure 2.

Figure 2: Geology



Source: Superficial Deposits and Bedrock Geology (Geo Insight Report, Ref: WTM1-6500721)

A summary of the geology is provided in Table 3.

Table 3: Site Geology

Stratum	Area Covered	Estimated Thickness	Typical Description
Hardstanding	Entire Site.	0.5m	Concrete.
Made Ground	Entire Site.	0.5 – 1.5m	Brown sandy clay with gravel, brick fragments and ash.
Kempton Park Gravel Member	Entire Site.	2.5 – 5m	Brown medium dense, sub-rounded fine to coarse gravel with coarse to medium sand with pockets of cobbles.
London Clay Formation	Entire Site.	At least 20m	Stiff brown clay with occasional pockets and partings of silts, fine sand and medium selenite gravels.

3.3.1 Ground Stability

The BGS map does not reveal any structural, geomorphological or geochemical features on or near Site.

The Groundsure dataset identifies a moderate hazard rating for shrink-swell; a very low risk for landslides, collapsible deposits and running sands hazards and a negligible risk rating for soluble rocks and compressible deposits hazards.

The Site is not in an area that could be affected by coal or metalliferous mining activity.

3.3.2 Ground Gas and Vapours

Radon

Radon is a colourless and odourless radioactive gas, formed from the decay of naturally occurring uranium within soils and rocks. The radioactive elements formed by the decay of radon may be inhaled, entering the lungs, and potentially leading to localised damage, and lung cancer.

Current Building Regulations endorsed by Public Health England (PHE) detail that all new buildings or extensions require radon protective measures where the development is in an area of high radon.

Information recovered from the Landmark Report, BGS, and PHE show that the Site is not in an area of high radon levels. Correspondingly, no protective measures will be required in the proposed development. This approach should be confirmed with the Building Control Officer.

Ground Gas

The Groundsure dataset identified no registered landfills and other potential sources of ground gas within 500m of the Site.

The potential for ground gas has been further assessed according to the Waterman Ground Gas Risk Assessment Tool, with results reproduced in Appendix D. Following assessment, the Site is considered a very low risk for ground gas issues. Based on the sensitivity of the end-use receptor, no further ground gas investigation or assessment is required.

Vapours

Land uses with the potential to result in ground contamination with vapour risks to the Site have been identified. Unspecified tanks were located 27m west off-Site between 1983 – 2003. A petrol station located 485m north of the Site is located too far away to pose a risk of vapours to the Site.

The Groundsure dataset has recorded two pollution incidents relating to oils or fuels within 500m of Site. A pollution incident involving the discharge of diesel to the ground 293m northeast of Site occurred. The

incident is categorised 4 (no impact) to waterways, land and air.

The discharge of unidentified oil to the ground 305m southwest of Site has been recorded. The incident is categorised 4 (no impact) to waterways, land and air.

Considering the distance from the Site and assessed impact of identified sources, there is a moderate vapour risk to the Site.

3.4 Controlled Waters

3.4.1 Surface Waters

The nearest surface water to the Site is Moselle Brook, which is approximately 360m west. Moselle Brook flows west to east towards River Lea. The brook is heavily modified and flows through a culvert along White Hart Lane and High Road.

The Environment Agency (EA) has classified the Ecological Potential of this surface water body under the Water Framework Directive as having a moderate ecological quality and good chemical quality.

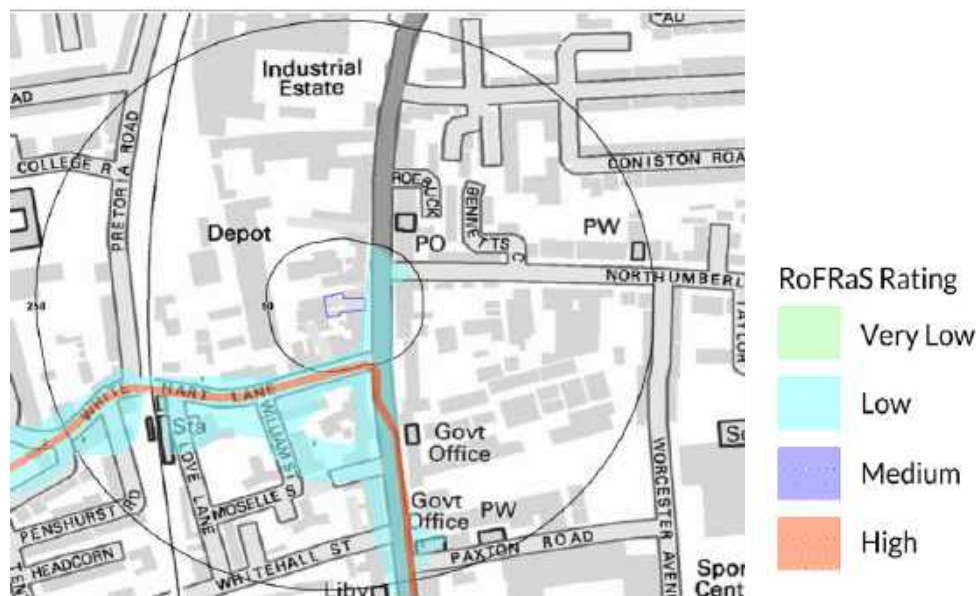
There are no recorded surface water abstractions and no surface water discharge consents listed within a 1km radius of the Site.

3.4.2 Flood Risk

According to the EA's indicative flooding data, the majority of Site is in within Flood Zone 1. The eastern boundary of the Site is in Flood Zone 2. There are no recorded flood defences in the area.

The risk of flooding from rivers or seas is shown in Figure 3 below:

Figure 3: Flood Risk from Rivers or Seas



Source: Risk of flooding from Rivers and the Sea (Enviro Insight Report, ref: WTM1-6500720)

The EA's indicative flooding data also indicates that the Site is located in an area at risk of surface water flooding. The risk of flooding is assessed as low.

Figure 4: Flood Risk from Surface Water



Source: Surface water flood risk (<https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>)

The EA's indicative flooding data also indicates that the Site is in an area at risk of groundwater flooding. The Site is in an area with potential for groundwater flooding to occur at surface level.

3.4.3 Groundwater

According to the BGS Groundwater Vulnerability Map, from BGS online dataset (accessed online 05/12/2019), the geological deposits underlying the Site are classified as per Table 4.

Table 4: Summary of Hydrogeological Properties of the Main Geological Strata

Stratum	EA Classification	Hydrogeological Significance
Hardstanding	Not applicable	Not applicable
Made Ground	Unproductive Strata	Contains insignificant quantities of vertically or laterally extensive groundwater
Kempton Park Gravel Member	Secondary A Aquifer	May be important in supporting local abstractions or in providing baseflow to rivers and streams
London Clay Formation	Unproductive Strata	Contains insignificant quantities of vertically or laterally extensive groundwater

The Site is not located within a groundwater Source Protection Zone.

Based on available information, it is anticipated that groundwater flow will be in a southerly direction towards the River Lea.

There are no recorded groundwater abstractions and groundwater discharge consents listed within a 1km radius of the Site.

3.5 Ecological Systems

The Groundsure dataset identified no following ecological systems to be within 1km of the Site. A Nitrate Vulnerable Zone exists 228m east of Site.

3.6 Consultations

The agencies and individuals which have been contacted and/or their records reviewed during the course of this study are listed in Table 5.

Table 5: List of Parties Consulted During This Study

Organisation	Consultee	Response
London Borough of Haringey		
Environmental Health	Kenny Abere	Pending
Planning	Online Planning Register	Accessed: 13 December 2019
Building Control	Jamie Villalobos	Response received (04/12/2019)
London Fire Brigade		
Petroleum Licensing	Jon Colquhoun	Response received (05/12/2019)

3.6.1 Environmental Health

Information has been requested from the Environmental Health Officer (EHO) but a response is currently pending.

3.6.2 Planning Department

A review of the London Borough of Haringey's online planning register identified that recent planning applications are for minor alterations to the building structure and exterior.

3.6.3 Building Control Department

Information has been requested from Building Control Department and a response is provided in Appendix C, which stated that the Council does not hold this type of information on ground conditions. However, local knowledge was provided stating:

- Ground varies between moist brown clay and gravel.

3.6.4 Petroleum Licensing Department

The Petroleum Licensing Officer confirmed the authority holds no record of petroleum storage tanks on this Site.

3.7 Previous Environmental Assessments

No previous environmental assessments of the Site have been provided for review.

4. Hazard Assessment and Preliminary Conceptual Model

The Preliminary Conceptual Model for the Site is presented in Table 7 below and graphically in Figure A3 in Appendix A. The risk rating included in Table 7 has been assessed qualitatively using the criteria given in Appendix E and the potential receptors identified using the criteria given in Appendix F.

4.1 Contaminants of Concern

Contaminants typically associated with made ground, the former smithy on-Site and activities relating to commercial and residential land use include heavy metals, asbestos and hydrocarbons.

Contaminants of concern identified at the Site are summarised in Table 6. The potential contaminants associated with former and current land uses are informed by DoE Industry Profiles (1995) where applicable.

Table 6: Contaminants of Concern

Source	Metals	Semimetals /non-metals	PAHs	TPHs	MTBE	BTEX	VOC/SVOC	Solvents	PCBs	pH/SOM/TO C/moisture	Asbestos	Detergents, acid/alkali	Ground Gas	Vapours	Sulphates/ Chlorides
Made Ground	x	x	x	x			x			x	x		x		x
Smithy (on-Site)	x	x		x	x	x					x				
Unspecified Tank (off-Site)			x	x	x	x	x							x	
Railway and Tramway line (off-Site)	x		x	x			x		x		x				x
Vehicle repair and servicing (off-Site)	x	x	x	x	x	x	x	x			x				

4.2 Disrupted Contaminant Linkages

The following linkages were assessed as disrupted or absent in the sections above and will not be carried over into the conceptual model:

- Risk future Site users from ground contamination. The new development structure will completely occupy the Site, and form a barrier between any ground contamination and future Site users;
- Risk to surface water from on-Site soils. This linkage is incomplete due to absence of significant sources (distance between closest surface water and the Site is 360m); and
- Ground gas and vapour risk potential was assessed as low. This linkage is incomplete due to absence of significant sources.

Table 7: Outline Conceptual Site Model

Source	Linkage	Receptor	Risk	Justification / Mitigation	Residual Risk
Human Health					
Dust and surface runoff from construction materials storage, stockpiled soils and bare earth surfaces during construction.	Dermal contact, inhalation and ingestion	Off-Site residents/users; Construction workers	Medium	A Construction Environmental Plan (CEMP) should be prepared including measures to prevent mobilisation of dust and run-off from stockpiled soils off-Site. As required, these will comprise a dampening down and covering of soil stockpiles. This would also include measures to prevent surface runoff of stockpiled soils or leaks from construction materials to drainage on-Site.	Low
Shallow ground contamination from former activities on-Site and surrounding land uses.	Dermal contact, ingestion and inhalation	Construction workers	Medium	Construction workers should be asbestos aware, provided with personal protective equipment (PPE) and respiratory protective equipment (RPE) as appropriate, and informed of good hygiene measures.	Low
Property					
Shallow ground contamination from former activities on-Site and surrounding land uses.	Contact with building foundations and buried services	Future on-Site structures	Low	Foundations and buildings at the new development will be designed to resist any ground contamination informed by the findings of future geotechnical investigation necessary for foundations design. This will mitigate the risk to future structures.	Low
Ground gas and vapour emissions	Ingress into confined spaces within buildings	Future on-Site structures	Low	An assessment of the ground gas generation potential of soils beneath the Site identified a very low risk for ground gas generation. No significant hydrocarbon sources with the potential to cause vapour emissions have been identified at the Site.	Low
Ecological Systems					
Shallow ground contamination from former activities on-Site and surrounding land uses.	Lateral migration of ground contamination to soil	Future on-Site and off-Site residents	Low	The likely nature of any potential contamination present at the Site is low as the Site plans indicate no soft landscaping will be present in contact with soils beneath the Site. Where new landscaping is proposed at the terrace garden above the ground floor, this should be provided with certified clean topsoil.	Low
Controlled waters					
Contamination from former activities on-Site and surrounding land uses.	Leaching of ground contamination to groundwater	Secondary A Aquifer in the Kempton Park Gravel Member stratum	Low	Significant sources of contamination have not been identified on-Site that would lead to the contamination of groundwater. Some historically minor potentially contaminative land uses have been identified within and surrounding the Site. However, given their significance and distance from the Site these are not considered relevant. Potentially contaminative land uses are not anticipated at the completed development.	Low

5. Conclusions

Given the proposed end use the overall risk rating for the Site is assessed as low.

Potentially Unacceptable Risks

Potentially significant sources of contamination were not present on Site. Potential contaminant linkages identified for the Site are as follows:

- Existing off-Site residents/users contacting ground contamination via surface runoff or dust generated during construction works; and
- Construction workers contacting ground contamination or dust through material handling during the works.

Given the Site history and the proposed development intrusive investigation to further quantify the contamination status of the Site is considered not to be required.

On completion of the development, the risks are anticipated to be Low. Therefore, the NPPF requirement that on completion the Site can no longer be captured under the Part IIA regime is expected to be met.

6. Recommendations

The following actions are recommended to address the potentially unacceptable risks identified:

- A watching brief by experience personnel should be carried out during the construction for the presence of unforeseen contamination and greater deposits of made ground than previously anticipated. Should unforeseen contamination be encountered, works in the area of the contamination should be halted and the advice of an environmental consultant sought. The Environmental Health Officer will be informed of the contamination and remedial measures to be carried out to break identified contamination receptors;
- Construction workers should be provided with personal protective equipment (PPE), and informed of good hygiene measures as protection against direct contact with contaminated soils, dust inhalation, ground gas and vapours;
- A Construction Environmental Management Plan (CEMP) should be prepared for the Site, including measures to minimise runoff from stockpiled soils, and to suppress the generation of dust;
- Construction materials brought on-Site as part of works should be appropriately stored to prevent spills and leaks; and
- Buried structures and services at the completed development should be suitably designed to resist chemical attack.

Appendices

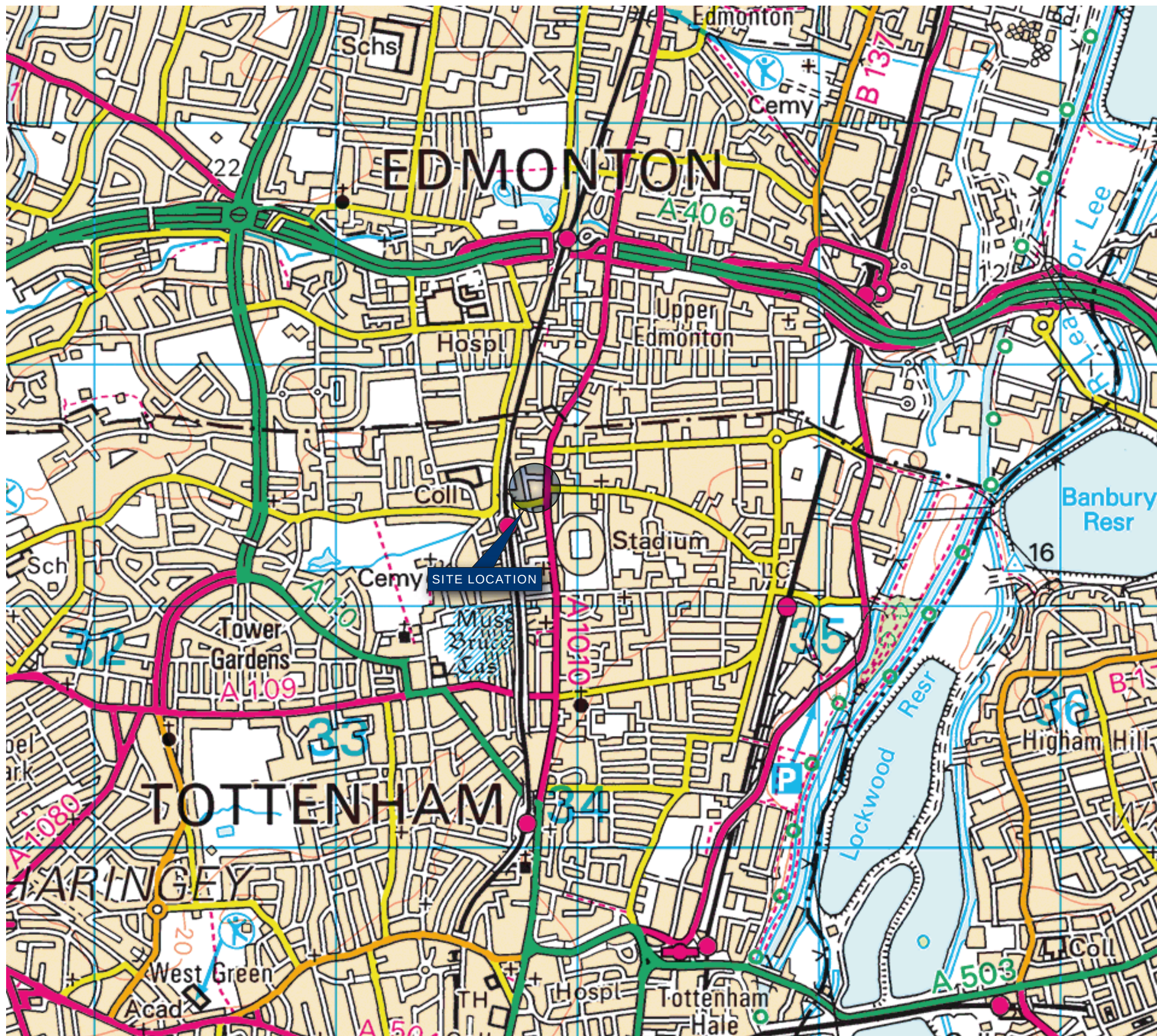
Appendices

Preliminary Risk Assessment
WIE16362-101-R-1.2.1-PRA

A. Site Plans

- **Site Location Plan**
- **Site Plan**
- **Proposed Development**
- **Conceptual Model**

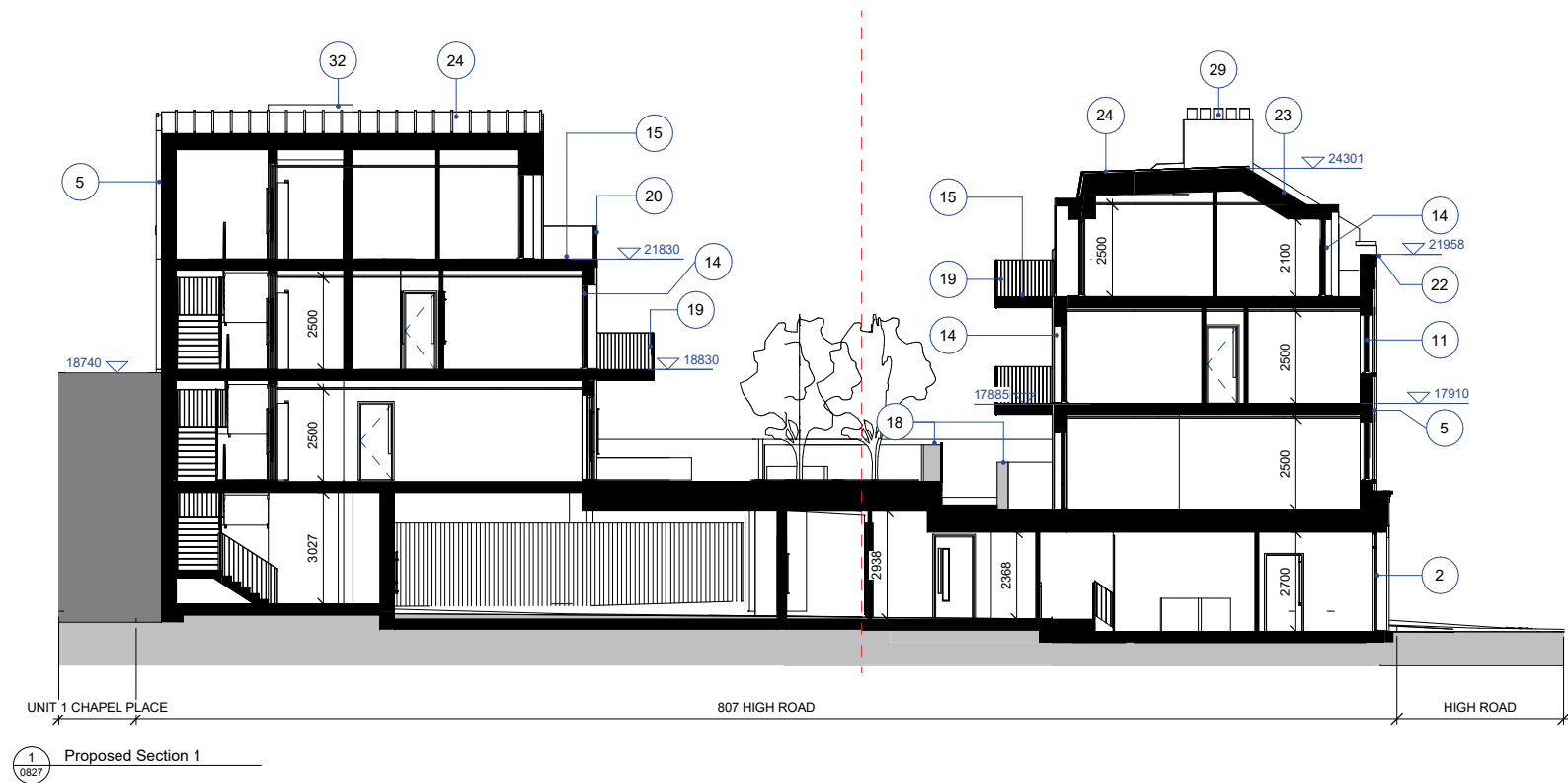
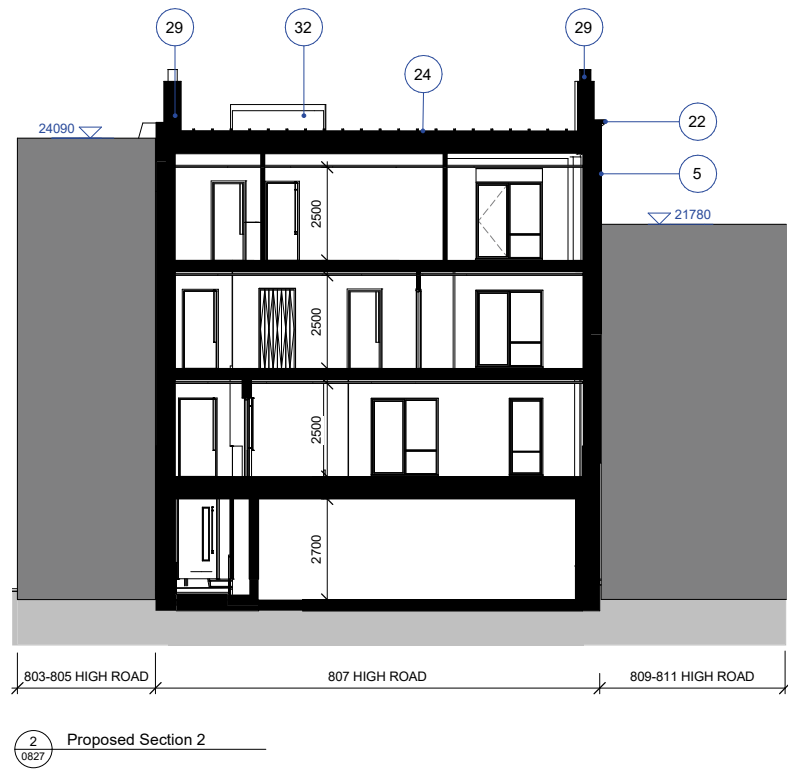
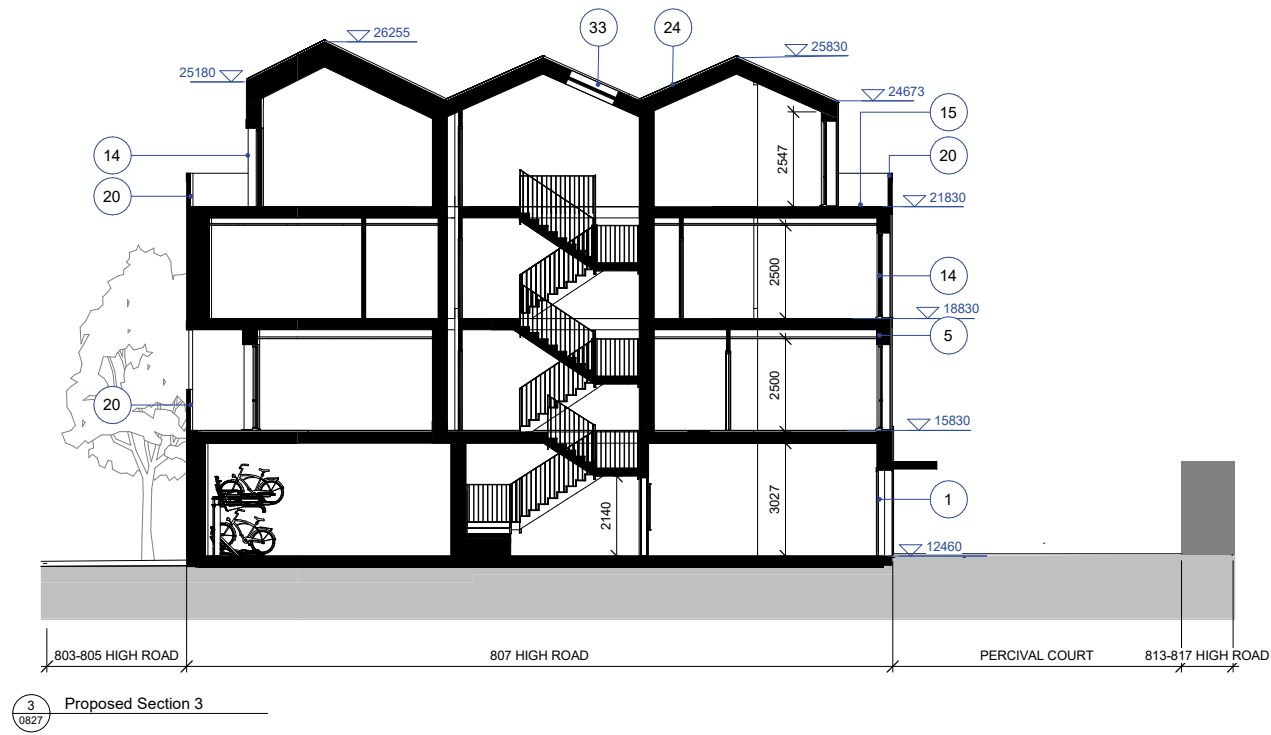
Appendices



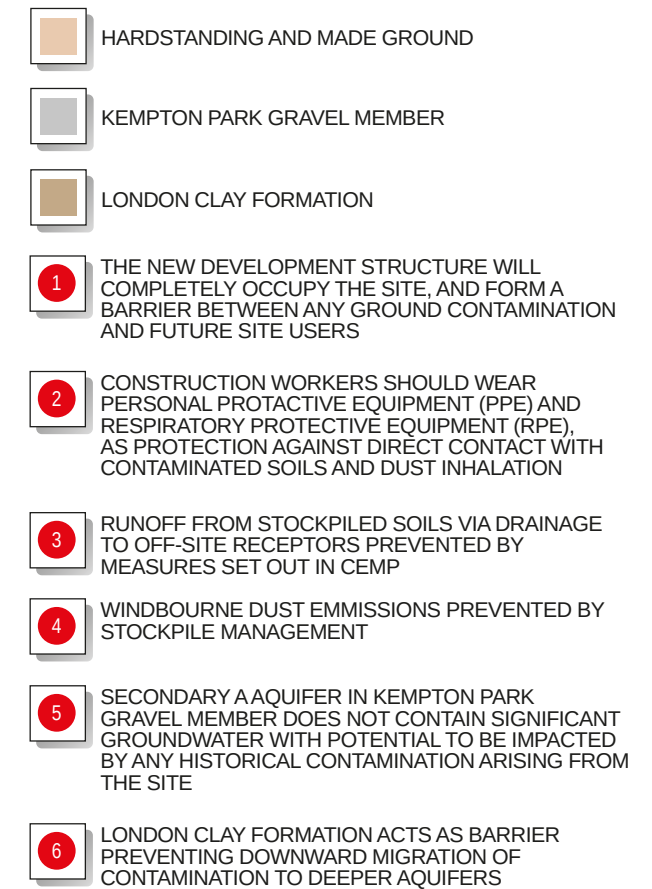
Project Details	WIE16362-100: 807 High Road
Figure Title	Figure A1: Site Location Plan
Figure Ref	WIE16362-100_GR_PERA_A1A
Date	December 2019
File Location	\\s-Incs\wiel\projects\wie16362\100\graphics\peral\issued figures



Project Details	WIE16362-100: 807 High Road
Figure Title	Figure A2: Site Plan
Figure Ref	WIE16362-100_GR_PERA_A2A
Date	December 2019
File Location	\\s-incs\wiel\projects\wie16362\100\graphics\peralissued figures



Project Details	WIE16362-100: 807 High Road
Figure Title	Figure A3: Proposed Sections
Figure Ref	WIE16362-100_GR_PERA_A3B
Date	March 2020
File Location	\\s-incs\wiel\projects\wie16362\100\graphics\peral\issued figures
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B. Site Photographs

Appendices

Preliminary Risk Assessment
WIE16362-101-R-1.2.1-PRA



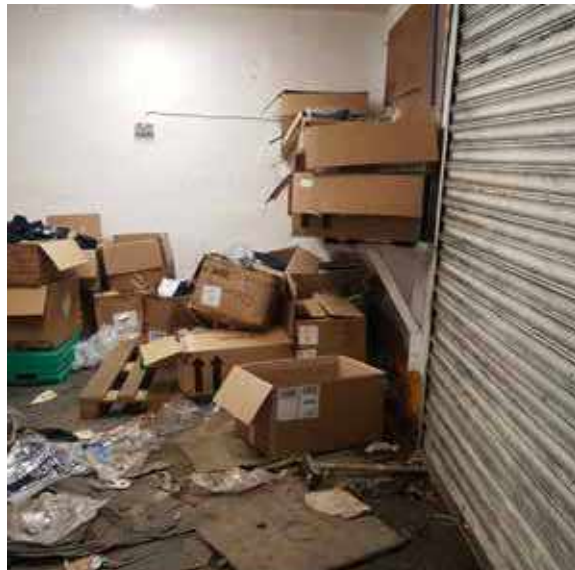
View of Percival Court located north of Site. A motor repair and service garage is situated in an industrial depot in the background



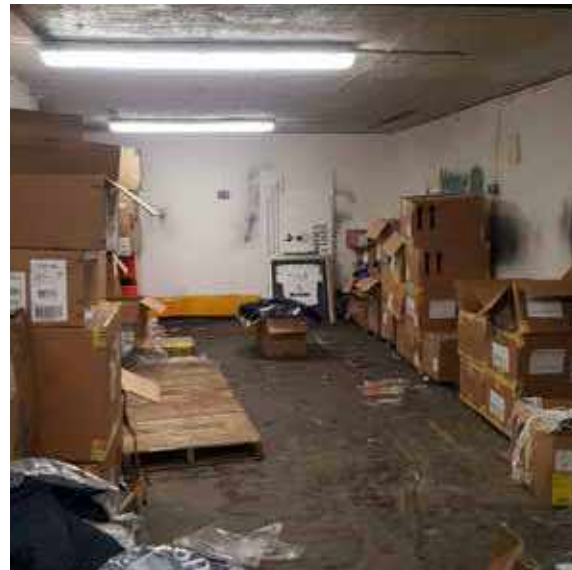
View of the storage area situated in the rear of the property from Percival Court.



View of the rear of the property (north of Site).



Inside of the storage area to the right. A drain inset in the hardstanding located at the entrance.



Inside view of the storage area to the right. Plastic lining covers the hardstanding ground.



Inside view of the storage area to the left. A drain channel (bottom left) is inset into hardstanding.



Drainage inset around the rear of the property (north of Site).



Drainage inset on the ground floor centre of Site.

Project Details	WIE16362-100: 807 High Road
Figure Title	Figure B1: Site Photographs
Figure Ref	WIE16362-100_GR_PERA_B1A
Date	December 2019
File Location	\\s-lncs\wiel\projects\wie16362\100\graphics\peral\issued figures
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C. Consultation Information

- **Groundsure Technical Report**
- **Historic Maps**
- **Response from Building Control Department**
- **Response from Petroleum licensing**

Appendices



Waterman Infrastructure & Environment
Limited

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Groundsure
Reference:

WTM1-6500720

Your Reference: WIE16362_-_PO_REQ101717

Report Date 4 Dec 2019

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Address: FLAT 1, 807, HIGH ROAD, TOTTENHAM, LONDON, N17 8ER

Date: 4 Dec 2019

Reference: WTM1-6500720

Client: Waterman Infrastructure & Environment Limited

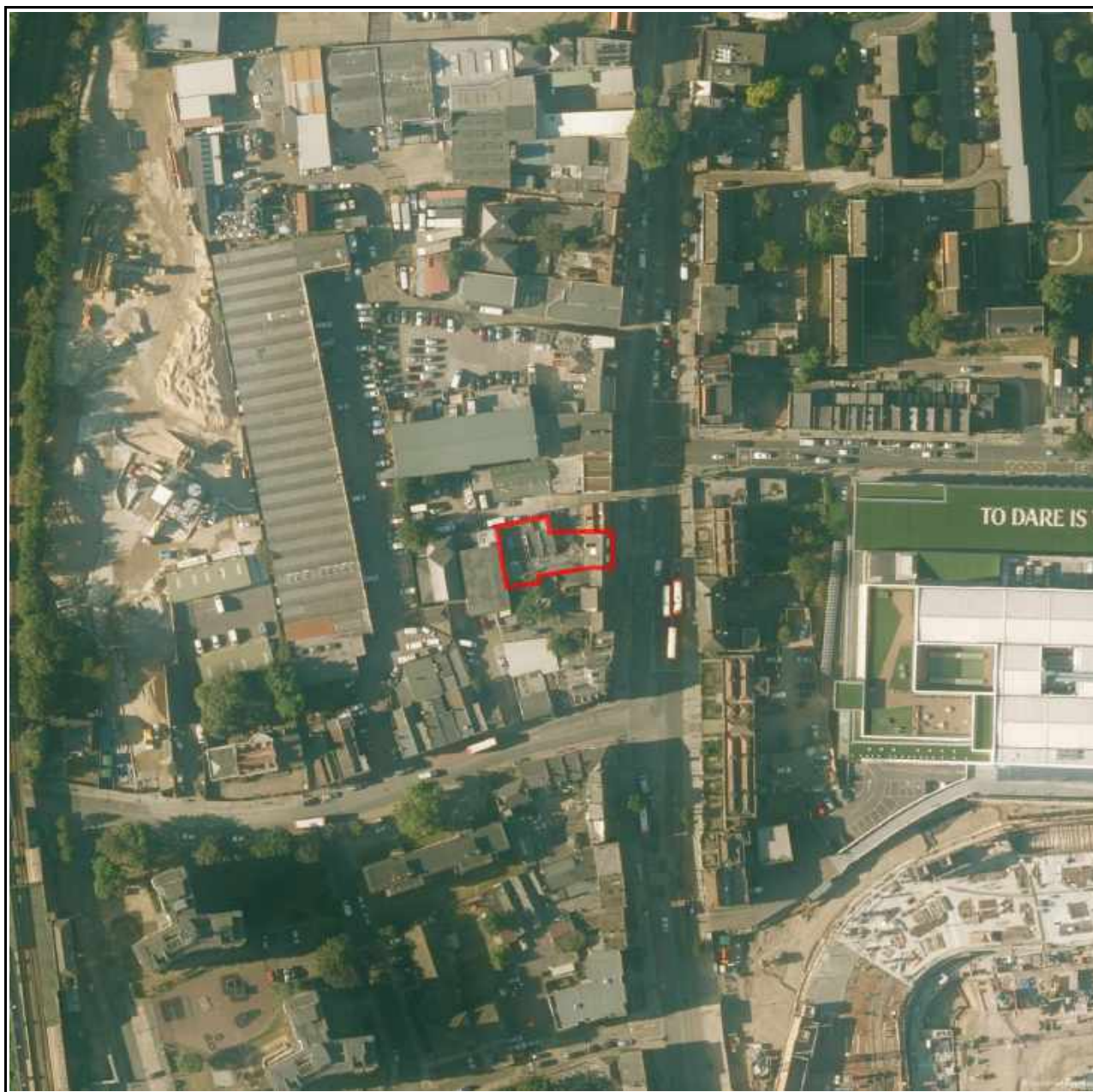
NW

N

NE

W

E



SW

S

SE

Aerial Photograph Capture date: 12-Aug-2016

Grid Reference: 533846,191455

Site Size: 0.0515ha

Report Reference: WTM1-6500720

Client Reference: WIE16362_-_PO_REQ101717

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Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Historical Industrial Sites	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	3	8	43	70
1.2 Additional Information – Historical Tank Database	0	4	12	19
1.3 Additional Information – Historical Energy Features Database	0	0	48	59
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	0	12	20
1.6 Historical military sites	0	0	0	0
1.7 Potentially Infilled Land	0	0	2	23
Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	3	3
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	0	0	0	0
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	0
2.2 Records of COMAH and NIHHS sites	0	0	0	0
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	0	0	0	2
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

Section 3: Landfill and Other Waste Sites	On-site	0-50m	51-250	251-500	501-1000	1000-1500
3.1 Landfill Sites						
3.1.1 Environment Agency/Natural Resources Wales Registered Landfill Sites	0	0	0	0	0	Not searched
3.1.2 Environment Agency/Natural Resources Wales Historic Landfill Sites	0	0	0	0	0	2
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	0	1
3.2 Landfill and Other Waste Sites Findings						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	4	1	Not searched	Not searched
3.2.2 Environment Agency/Natural Resources Wales Licensed Waste Sites	0	0	3	0	6	13

Section 4: Current Land Use	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	0	3	40	Not searched
4.2 Records of Petrol and Fuel Sites	0	0	1	1
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

Section 5: Geology	
5.1 Records of Artificial Ground and Made Ground present beneath the study site	None identified
5.2 Records of Superficial Ground and Drift Geology present beneath the study site	Identified
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 6: Hydrogeology and Hydrology	0-500m					
6.1 Records of Strata Classification in the Superficial Geology within 500m of the study site	Identified					
6.2 Records of Strata Classification in the Bedrock Geology within 500m of the study site	Identified					
	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	2	0	29
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	7
6.6 Source Protection Zones (within 500m of the study site)	0	0	1	0	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	1	0	0	0	Not searched	Not searched

Section 6: Hydrogeology and Hydrology

0-500m

	On-site	0-50m	51-250	251-500	501-1000	1000-1500
6.9 Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site	No	No	No	No	No	No
6.10 Ordnance Survey MasterMap Water Network entries within 500m of the site	0	2	0	4	Not searched	Not searched
6.11 Surface water features within 250m of the study site	No	No	No	Not searched	Not searched	Not searched

Section 7: Flooding

7.1 Environment Agency Zone 2 floodplains within 250m of the study site	Identified					
7.2 Environment Agency/Natural Resources Wales Zone 3 floodplains within 250m of the study site	None identified					
7.3 Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site	Low					
7.4 Flood Defences within 250m of the study site	None identified					
7.5 Areas benefiting from Flood Defences within 250m of the study site	None identified					
7.6 Areas used for Flood Storage within 250m of the study site	None identified					
7.7 Maximum BGS Groundwater Flooding susceptibility within 50m of the study site	Potential at Surface					
7.8 BGS confidence rating for the Groundwater Flooding susceptibility areas	Moderate					

Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	0	1
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	1
8.5 Records of Ramsar sites	0	0	0	0	0	1
8.6 Records of Ancient Woodlands	0	0	0	0	0	0
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	0
8.8 Records of World Heritage Sites	0	0	0	0	0	0
8.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0

Section 8: Designated Environmentally Sensitive Sites	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0
8.11 Records of National Parks	0	0	0	0	0	0
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	0	0	1	0	0	0
8.14 Records of Green Belt land	0	0	0	0	0	5

Section 9: Natural Hazards	
9.1 Maximum risk of natural ground subsidence	Moderate
9.1.1 Maximum Shrink-Swell hazard rating identified on the study site	Moderate
9.1.2 Maximum Landslides hazard rating identified on the study site	Very Low
9.1.3 Maximum Soluble Rocks hazard rating identified on the study site	Negligible
9.1.4 Maximum Compressible Ground hazard rating identified on the study site	Negligible
9.1.5 Maximum Collapsible Rocks hazard rating identified on the study site	Very Low
9.1.6 Maximum Running Sand hazard rating identified on the study site	Very Low
9.2 Radon	
9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
9.2.2 Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary.

Section 10: Mining	
10.1 Coal mining areas within 75m of the study site	None identified
10.2 Non-Coal Mining areas within 50m of the study site boundary	None identified
10.3 Brine affected areas within 75m of the study site	None identified

Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between Groundsure and the Client. The document contains the following sections:

1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 500m.

2. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

3. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

4. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure gas pipelines and underground electricity transmission lines.

5. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

6. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licences, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

7. Flooding

Provides information on river and coastal flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

8. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

9. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence and radon..

10. Mining

Provides information on areas of coal and non-coal mining and brine affected areas.

11. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, Groundsure provide a free Technical Helpline (08444 159000) for further information and guidance.

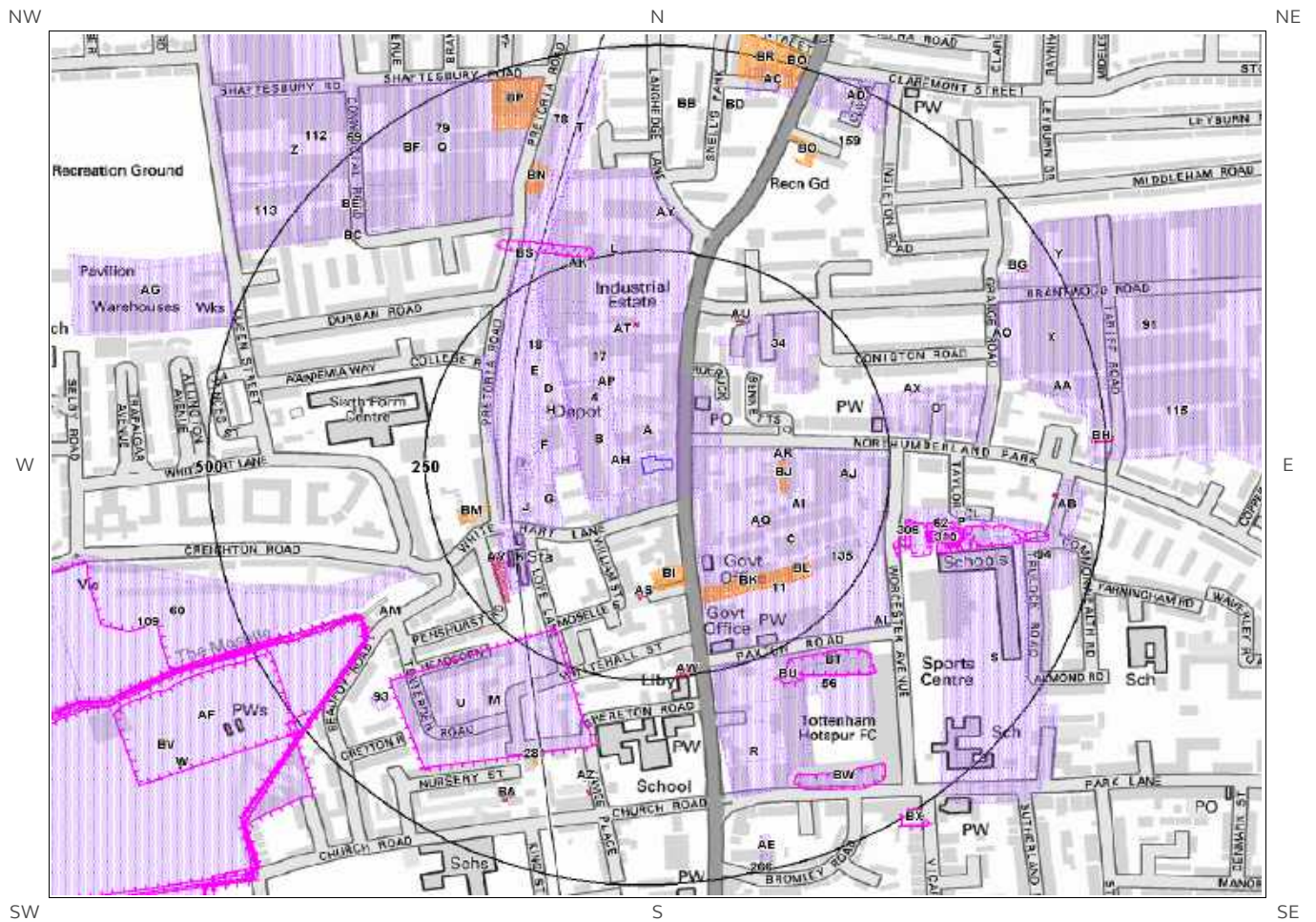
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier "A" on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

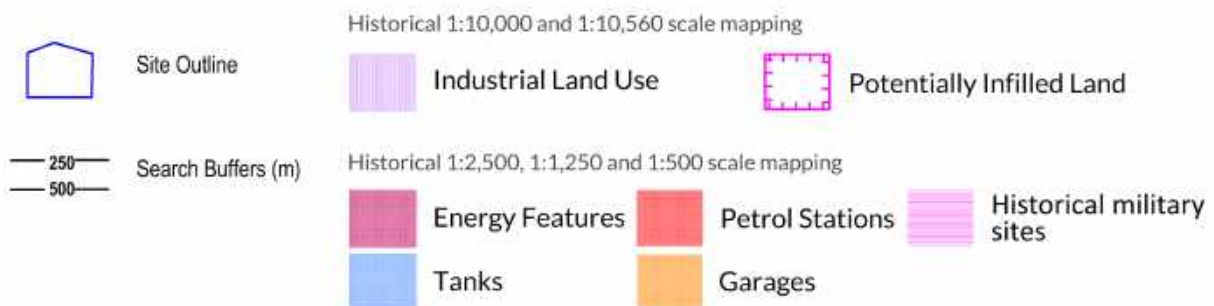
Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

1. Historical Land Use



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1. Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 124

ID	Distance [m]	Direction	Use	Date
1AT	0	On Site	Industrial Estate	1991
2A	0	On Site	Brewery	1879
3A	0	On Site	Brewery	1869
4	20	W	Unspecified Works	1982
5B	20	SW	Unspecified Works	1974
6B	24	SW	Unspecified Works	1966
7C	25	E	Unspecified Works	1991
8C	29	E	Unspecified Commercial/Industrial	1982
9D	43	NW	Nursery	1869
10D	43	NW	Nursery	1879
11	47	SE	Unspecified Works	1966
12D	71	W	Railway Sidings	1982
13E	72	W	Railway Sidings	1938
14E	73	W	Railway Sidings	1966
15E	73	W	Railway Sidings	1974
16E	74	W	Railway Sidings	1920
17	74	N	Unspecified Works	1966
18	75	W	Railway Sidings	1951
19AI	89	E	Unspecified Works	1966
20E	103	W	Railway Sidings	1894
21F	106	W	Railway Building	1982
22F	109	W	Railway Buildings	1974
23	110	W	Railway Sidings	1896
24G	110	W	Railway Building	1920
25G	111	W	Railway Building	1894
26H	112	NW	Railway Building	1982
27H	113	NW	Railway Building	1974
28F	116	W	Railway Building	1966
29H	120	NW	Railway Building	1966
30I	125	W	Railway Buildings	1938
31I	128	W	Railway Buildings	1920
32I	128	W	Railway Building	1966
33I	128	W	Railway Building	1894

34	132	NE	Unspecified Works	1966
35J	134	W	Railway Building	1966
36J	138	W	Railway Building	1894
37I	141	W	Railway Building	1894
38K	157	SW	Railway Station	1982
39K	159	SW	Railway Station	1974
40K	159	SW	Railway Buildings	1938
41K	161	SW	Railway Station	1991
42K	161	SW	Railway Station	1966
43K	161	SW	Railway Station	1951
44K	161	SW	Railway Station	1894
45K	162	SW	Railway Station	1896
46K	163	SW	Railway Station	1920
47L	164	N	Unspecified Works	1966
48L	184	N	Unspecified Commercial/Industrial	1982
49BS	185	NW	Railway Sidings	1896
50M	214	SW	Brick Field	1869
51M	214	SW	Brick Field	1879
52O	231	E	Nursery	1894
53N	242	S	Unspecified Works	1982
54N	243	S	Unspecified Works	1991
55O	266	E	Nursery	1896
56	267	SE	Nursery	1896
57BT	267	SE	Unspecified Heap	1920
58BU	275	SE	Unspecified Heap	1920
59P	276	E	Nursery	1896
60	282	SW	Nurseries	1896
61P	282	E	Nursery	1894
62	293	E	Nursery	1896
63Q	313	NW	Unspecified Commercial/Industrial	1982
64Q	313	NW	Unspecified Works	1991
65Q	313	NW	Unspecified Works	1966
66Q	313	NW	Unspecified Works	1974
67R	313	S	Unspecified Works	1966
68R	313	S	Unspecified Works	1974
69	314	NW	Unspecified Commercial/Industrial	1951
70S	322	E	Nursery	1894
71S	341	E	Nursery	1896
72S	347	E	Nursery	1920
73T	348	N	Railway Sidings	1938
74T	349	N	Railway Sidings	1920
75S	349	E	Nursery	1938
76U	351	SW	Clay Mill	1869
77U	351	SW	Clay Mill	1879

78	363	N	Railway Sidings	1894
79	369	NW	Unspecified Commercial/Industrial	1938
80W	370	SW	Cemetery	1938
81V	371	SW	Cemetery	1974
82V	371	SW	Cemetery	1951
83BV	371	SW	Cemetery	1982
84V	371	SW	Cemetery	1991
85V	371	SW	Cemetery	1966
86W	372	SW	Cemetery	1920
87W	372	SW	Cemetery	1894
88X	391	E	Unspecified Works	1982
89X	391	E	Unspecified Works	1966
90X	391	E	Unspecified Works	1974
91	394	E	Industrial Estate	1991
92BW	398	S	Unspecified Heap	1920
93	399	SW	Unspecified Tank	1991
94	401	E	Nursery	1894
95Y	427	NE	Unspecified Works	1982
96Y	427	NE	Unspecified Works	1974
97Z	430	NW	Unspecified Works	1982
98Z	430	NW	Unspecified Works	1966
99Z	430	NW	Industrial Estate	1991
100Z	430	NW	Unspecified Works	1974
101AA	433	E	Nursery	1897
102AA	436	E	Nursery	1896
103AB	440	E	Nursery	1897
104AB	441	E	Nursery	1896
105AC	451	N	Unspecified Manufactory	1866
106AC	451	N	Unspecified Manufactory	1864
107AA	454	E	Nursery	1920
108AE	457	S	Fire Station	1966
109	458	W	Nurseries	1894
110AD	460	NE	Unspecified Manufactory	1864
111AD	463	NE	Smithy	1920
112	474	NW	Unspecified Commercial/Industrial	1938
113	475	NW	Unspecified Works	1982
114AD	476	NE	Smithy	1920
115	480	E	Nursery	1894
116AE	481	S	Fire Engine Station	1920
117AF	482	SW	Cemetery	1879
118AF	482	SW	Cemetery	1869
119AD	492	NE	Smithy	1920
120AG	497	W	Unspecified Works	1966
121AG	497	W	Unspecified Works	1974

122AG	497	W	Furniture Manufactory	1951
123AG	498	W	Unspecified Works	1982
124AG	498	W	Unspecified Works	1991

1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 500m of the search boundary:

35

ID	Distance (m)	Direction	Use	Date
125AH	23	W	Tanks	1983
126AH	23	W	Tanks	1996
127AH	23	W	Tanks	1992
128AH	23	W	Tanks	1991
129AI	136	E	Unspecified Tank	1955
130AI	136	E	Unspecified Tank	1955
131AJ	199	E	Unspecified Tank	1955
132AJ	199	E	Unspecified Tank	1968
133AJ	199	E	Unspecified Tank	1967
134AJ	199	E	Unspecified Tank	1955
135	221	SE	Unspecified Tank	1913
136AK	243	N	Tanks	1992
137AK	243	N	Tanks	1997
138AK	244	N	Tanks	1984
139AK	245	N	Tanks	1970
140AK	245	N	Tanks	1975
141AK	251	N	Tanks	1992
142AK	251	N	Tanks	1997
143AK	253	N	Tanks	1975
144AK	253	N	Tanks	1970
145AL	302	SE	Tanks	1986
146AL	302	SE	Tanks	1981
147AL	303	SE	Tanks	1975
148AM	339	SW	Unspecified Tank	1983
149AM	339	SW	Unspecified Tank	1992
150AM	339	SW	Unspecified Tank	1996
151AM	339	SW	Unspecified Tank	1991
152AN	398	W	Unspecified Tank	1955
153AN	398	W	Unspecified Tank	1955
154AO	405	E	Unspecified Tank	1991
155AO	405	E	Unspecified Tank	1991
156AO	406	E	Unspecified Tank	1977

157AO	406	E	Unspecified Tank	1991
158AO	406	E	Unspecified Tank	1981
159	433	NE	Unspecified Tank	1867

1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 500m of the search boundary:

107

ID	Distance (m)	Direction	Use	Date
160AP	97	NW	Electricity Substation	1992
161AP	97	NW	Electricity Substation	1997
162AP	97	NW	Electricity Substation	1975
163AP	98	NW	Electricity Substation	1984
164AQ	117	SE	Electricity Substation	1996
165AQ	117	SE	Electricity Substation	1991
166AQ	118	SE	Electricity Substation	1981
167AQ	118	SE	Electricity Substation	1983
168AQ	118	SE	Electricity Substation	1972
169AR	125	E	Electricity Substation	1981
170AR	126	E	Electricity Substation	1996
171AR	126	E	Electricity Substation	1992
172AR	126	E	Electricity Substation	1991
173AR	126	E	Electricity Substation	1983
174AR	126	E	Electricity Substation	1972
175AS	143	S	Electricity Substation	1972
176AS	143	S	Electricity Substation	1983
177AS	143	S	Electricity Substation	1981
178AS	146	S	Electricity Substation	1992
179AS	146	S	Electricity Substation	1996
180AS	146	S	Electricity Substation	1991
181AT	159	N	Electricity Substation	1992
182AT	159	N	Electricity Substation	1997
183AT	159	N	Electricity Substation	1984
184AU	183	NE	Electricity Substation	1992
185AU	183	NE	Electricity Substation	1997
186AU	183	NE	Electricity Substation	1984
187AU	183	NE	Electricity Substation	1955
188AU	183	NE	Electricity Substation	1975
189AU	183	NE	Electricity Substation	1955
190AU	183	NE	Electricity Substation	1970
191K	188	SW	Electricity Substation	1955

192K	189	SW	Electricity Substation	1955
193K	189	SW	Electricity Substation	1955
194AV	197	SW	Electricity Substation	1996
195AV	197	SW	Electricity Substation	1992
196AV	197	SW	Electricity Substation	1991
197AV	197	SW	Electricity Substation	1955
198AV	198	SW	Electricity Substation	1972
199AV	198	SW	Electricity Substation	1983
200AV	198	SW	Electricity Substation	1981
201AW	241	S	Electricity Substation	1955
202AW	242	S	Electricity Substation	1981
203AW	243	S	Electricity Substation	1983
204AW	243	S	Electricity Substation	1996
205AW	243	S	Electricity Substation	1992
206AW	243	S	Electricity Substation	1991
207AW	246	S	Electricity Substation	1955
208AX	286	E	Electricity Substation	1977
209AX	286	E	Electricity Substation	1991
210AX	286	E	Electricity Substation	1991
211AX	286	E	Electricity Substation	1991
212AX	286	E	Electricity Substation	1981
213AY	291	N	Electricity Substation	1992
214AY	291	N	Electricity Substation	1997
215AZ	374	S	Electricity Substation	1983
216AZ	376	S	Electricity Substation	1992
217AZ	376	S	Electricity Substation	1996
218AZ	376	S	Electricity Substation	1991
219AZ	389	S	Electricity Substation	1981
220AZ	390	S	Electricity Substation	1972
221BA	416	S	Electricity Substation	1981
222BA	422	S	Electricity Substation	1983
223BA	422	S	Electricity Substation	1972
224BB	423	N	Electricity Substation	1992
225BB	423	N	Electricity Substation	1997
226BC	423	NW	Electricity Substation	1997
227BC	423	NW	Electricity Substation	1992
228BC	423	NW	Electricity Substation	1995
229BC	423	NW	Electricity Substation	1991
230BC	423	NW	Electricity Substation	1995
231BC	423	NW	Electricity Substation	1994
232BA	423	S	Electricity Substation	1992
233BA	423	S	Electricity Substation	1996
234BA	423	S	Electricity Substation	1991
235BC	424	NW	Electricity Substation	1973
236BB	424	N	Electricity Substation	1975
237BC	424	NW	Electricity Substation	1983

238BD	431	N	Electricity Substation	1992
239BD	431	N	Electricity Substation	1997
240BD	432	N	Electricity Substation	1984
241BD	435	N	Electricity Substation	1970
242BD	435	N	Electricity Substation	1975
243AB	438	E	Electricity Substation	1986
244AB	438	E	Electricity Substation	1981
245AB	440	E	Electricity Substation	1991
246AB	440	E	Electricity Substation	1996
247AB	440	E	Electricity Substation	1975
248BE	450	NW	Electricity Substation	1955
249BE	452	NW	Electricity Substation	1955
250BF	456	NW	Electricity Substation	1992
251BF	456	NW	Electricity Substation	1997
252BG	459	NE	Electricity Substation	1991
253BG	459	NE	Electricity Substation	1981
254BG	459	NE	Electricity Substation	1977
255BG	462	NE	Electricity Substation	1991
256BG	462	NE	Electricity Substation	1991
257BH	482	E	Electricity Substation	1981
258BH	482	E	Electricity Substation	1986
259BH	483	E	Electricity Substation	1991
260BH	483	E	Electricity Substation	1996
261BH	483	E	Electricity Substation	1955
262BH	483	E	Electricity Substation	1968
263BH	484	E	Electricity Substation	1975
264BH	484	E	Electricity Substation	1967
265BH	484	E	Electricity Substation	1955
266	497	S	Electricity Substation	1997

1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 500m of the search boundary:

0

Database searched and no data found.

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 500m of the search boundary:

32

ID	Distance (m)	Direction	Use	Date
267BI	115	S	Garage	1972
268BI	117	S	Garage	1964
269BJ	121	E	Garage	1992
270BJ	121	E	Garage	1996
271BK	148	S	Garage	1955
272BK	149	S	Garage	1955
273BK	149	S	Garage	1964
274BL	180	SE	Garage	1955
275BL	180	SE	Garage	1955
276BL	180	SE	Garage	1967
277BM	181	W	Garage	1992
278BM	181	W	Garage	1996
279BN	341	N	Garage	1992
280BN	341	N	Garage	1997
281	357	S	Garage	1964
282BO	389	N	Garage	1965
283BO	413	N	Garage	1955
284BO	414	N	Garage	1955
285BP	422	N	Garage	1992
286BP	422	N	Garage	1997
287BQ	467	N	Garage	1991
288BR	469	N	Garage	1964
289BQ	473	N	Garage	1991
290BQ	473	N	Garage	1991
291BQ	473	N	Garage	1977
292BQ	473	N	Garage	1965
293BR	474	N	Garage	1970
294BQ	474	N	Garage	1975
295BQ	491	N	Garage	1955
296BQ	492	N	Garage	1955
297BQ	497	N	Garage	1968
298BQ	497	N	Garage	1984

1.6 Historical military sites

Certain military installations were not noted on historic mapping for security reasons. Whilst not all military land is necessarily of concern, Groundsure has researched and digitised a number of Ordnance Factories and other military industrial features (e.g. Ordnance Depots, Munitions Testing Grounds) which may be of contaminative concern. This research was drawn from a number of different sources, and should not be regarded as a definitive or exhaustive database of potentially contaminative military installations. The boundaries of sites within this database have been estimated from the best evidence available to Groundsure at the time of compilation.

Records of historical military sites within 500m of the search boundary:

0

Database searched and no data found.

1.7 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site:

25

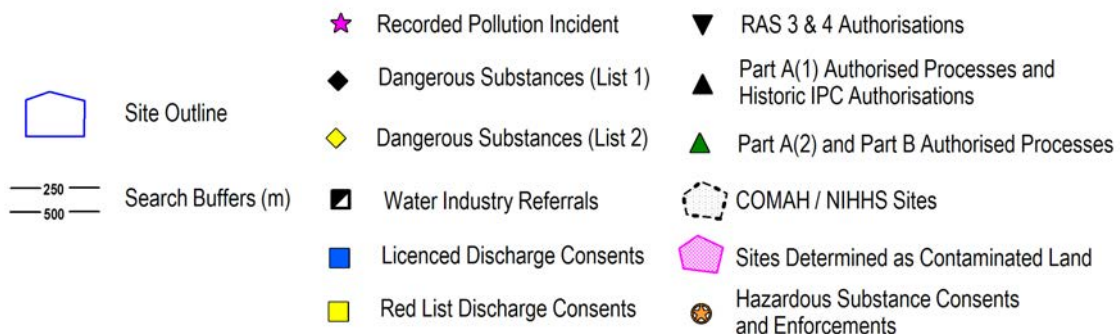
The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

ID	Distance(m)	Direction	Use	Date
299M	214	SW	Brick Field	1879
300M	214	SW	Brick Field	1869
301BS	252	N	Pond	1869
302BS	252	N	Pond	1879
303BT	267	SE	Unspecified Heap	1920
304P	270	E	Ponds	1869
305P	270	E	Ponds	1879
306	275	E	Pond	1894
307BU	275	SE	Unspecified Heap	1920
308P	300	E	Pond	1894
309P	303	E	Ponds	1938
310	305	E	Ponds	1920
311W	370	SW	Cemetery	1938
312V	371	SW	Cemetery	1974
313V	371	SW	Cemetery	1951
314V	371	SW	Cemetery	1966
315V	371	SW	Cemetery	1991
316BV	371	SW	Cemetery	1982
317W	372	SW	Cemetery	1920
318W	372	SW	Cemetery	1894
319BW	398	S	Unspecified Heap	1920
320AF	482	SW	Cemetery	1869
321AF	482	SW	Cemetery	1879
322BX	497	SE	Pond	1869
323BX	497	SE	Pond	1879

2. Environmental Permits, Incidents and Registers Map



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2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency/Natural Resources Wales and Local Authorities reveal the following information:

2.1.1 Records of historic IPC Authorisations within 500m of the study site:

0

Database searched and no data found.

2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

0

Database searched and no data found.

2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

6

The following Part A(2) and Part B Activities are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
3	64	S	533853 191382	Address: Superstar Dry Cleaners, 789 High Road, Tottenham, N17 8AH Process: Dry Cleaning Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified
4	168	N	533805 191629	Address: Euroclean, Unit 4, 867 High Rd, N17 8EY Process: Dry Cleaning Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified
5	175	S	533868 191272	Address: Autohouse, 776 High Road, N17 0BX Process: Respraying of Road Vehicles Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified
6A	252	S	533900 191200	Address: Total, High Rd, N17 0BX Process: Petrol Vapour Recovery Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified
7A	252	S	533900 191200	Address: Total, High Rd, N17 0BX Process: Petrol Vapour Recovery Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified
8	495	E	534357 191507	Address: W S Jenkins, Tariff Road, N17 0EN Process: Manufacture of Coating Materials Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

2.1.8 Records of Licensed Discharge Consents within 500m of the study site:

0

Database searched and no data found.

2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

0

Database searched and no data found.

2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

0

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site:

0

Database searched and no data found.

2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents

2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

2

The following NIRS List 2 records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details
1	293	NE	534067.0 191672.0	Incident Date: 12-Apr-2002 Incident Identification: 71202.0 Pollutant: Oils and Fuel Pollutant Description: Diesel Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
2	305	SW	533553.0 191319.0	Incident Date: 22-Mar-2002 Incident Identification: 65772.0 Pollutant: Oils and Fuel Pollutant Description: Unidentified Oil Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

Database searched and no data found.

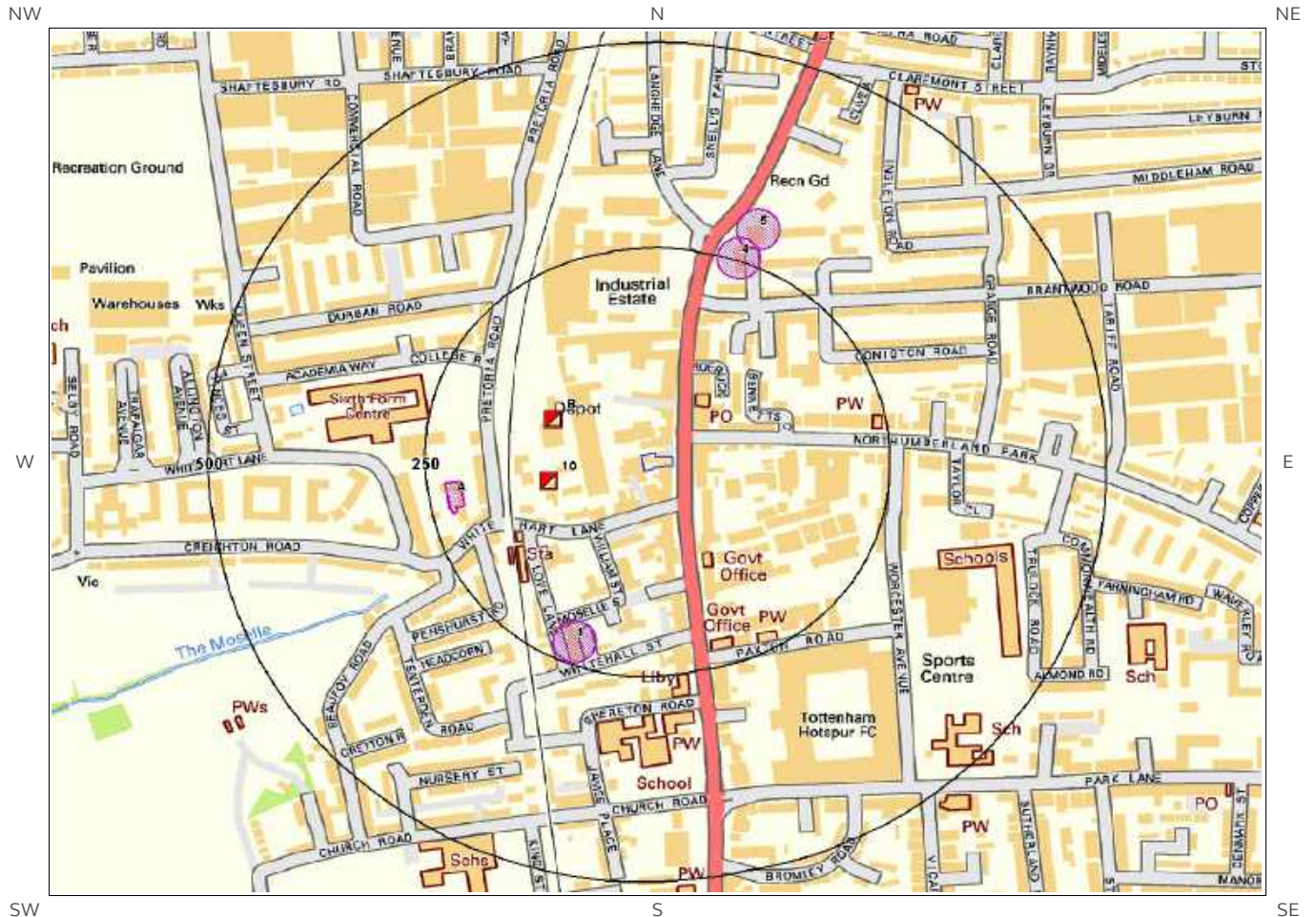
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

Records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site

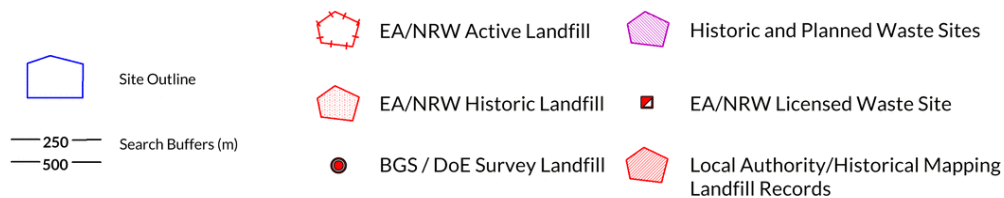
0

Database searched and no data found.

3. Landfill and Other Waste Sites Map



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3. Landfill and Other Waste Sites

3.1 Landfill Sites

3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site:

0

Database searched and no data found.

3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site:

2

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details
Not shown	1259	SE		Site Address: Tottenham Marshes, Tottenham Hale, Tottenham, Haringey, London Waste Licence: - Site Reference: 8HG002 Waste Type: Inert, Industrial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: 31-Dec-1955 Last Recorded: 31-Dec-1962
Not shown	1316	N		Site Address: Rear of Victoria Road, Victoria Road, Edmonton Waste Licence: - Site Reference: 8EN019 Waste Type: - Environmental Permitting Regulations (Waste) Reference: - Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: Local Authority Licence Holder: - First Recorded: 31-Dec-1936 Last Recorded: 31-Dec-1985

3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

0

Database searched and no data found.

3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:

1

The following landfill records are represented as points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Site Address	Source	Data Type
Not shown	1320	N	534065 192958	Pyecroft Way Landfill	Enfield Council	Polygon

3.2 Other Waste Sites

3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

5

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details		
1	198	S	533750 191235	Type of Site: Waste Storage Shed Site Address: 2-32 Whitehall Street, LONDON, Central London, N17 8BP	Planning Application Reference: HGY/2008/2265 Date: -	Further Details: Scheme comprises installation of pre cast concrete storage shed within housing estate boundary to facilitate storage and collection of bulk rubbish to council housing estate. An application (ref: HGY/2008/2265) for detailed planning permission was withdrawn from Haringey L.B. Planning decision obtained Data Source: Historic Planning Application Data Type: Point
2A	212	W	533612 191410	Type of Site: Scrap Yard Site Address: N/A	Planning Application Reference: N/A Date: 1983	Further Details: N/A Data Source: Historic Mapping Data Type: Polygon
3A	212	W	533612 191410	Type of Site: Scrap Yard Site Address: N/A	Planning Application Reference: N/A Date: 1991	Further Details: N/A Data Source: Historic Mapping Data Type: Polygon
4	229	N	533940 191702	Type of Site: Waste Storage Shed Site Address: Altair Close, LONDON, Central London, N17 0	Planning Application Reference: HGY/2008/2275 Date: -	Further Details: Scheme comprises installation of pre cast concrete storage shed within housing estate boundary to facilitate storage and collection of bulk rubbish to council housing estate. An application (ref: HGY/2008/2275) for detailed planning permission was granted by Haringey L.B.

ID	Distance (m)	Direction	NGR	Details	
					Planning decision obtained Data Source: Historic Planning Application Data Type: Point
5	269	N	533962 191737	Type of Site: Waste Storage Shed Site Address: Stellar House, 900 High Road, LONDON, Central London, N17 0DZ Planning Application Reference: HGY/2008/2271 Date: -	Further Details: Scheme comprises installation of pre cast concrete storage shed within housing estate boundary to facilitate storage and collection of bulk rubbish to council housing estate. An application (ref: HGY/2008/2271) for detailed planning permission was granted by Haringey L.B. Planning decision obtained Data Source: Historic Planning Application Data Type: Point

3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site:

22

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
8B	111	NW	533726 191507	Site Address: 44, White Hart Lane, Tottenham, London, N17 8DP Type: Metal Recycling Site (Vehicle Dismantler) Size: >= 25000 tonnes < 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: RED008 EPR reference: EA/EPR/EP3997NE/S002 Operator: Redcorn Ltd Waste Management licence No: 80607 Annual Tonnage: 824989.0	Issue Date: 10/01/2005 Effective Date: - Modified: - Surrendered Date: Oct 12 2016 12:00AM Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: White Hart Lane Correspondence Address: -
9B	111	NW	533726 191507	Site Address: B Luther, British Rail Sidings, 44, White Hart Lane, Tottenham, London, N17 8DP Type: Metal Recycling Site (Vehicle Dismantler) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: RED004 EPR reference: EA/EPR/RP3491NX/S002 Operator: Redcorn Ltd Waste Management licence No: 80343 Annual Tonnage: 0.0	Issue Date: 22/05/1996 Effective Date: - Modified: - Surrendered Date: Oct 12 2016 12:00AM Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: Redcorn Limited Correspondence Address: -
10	112	W	533720 191431	Site Address: B Luther, British Rail Sidings, 44, White Hart Lane, Tottenham, London, N17 8DP Type: Metal Recycling Site (Vehicle Dismantler) Size: < 25000 tonnes	Issue Date: 22/05/1996 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: -

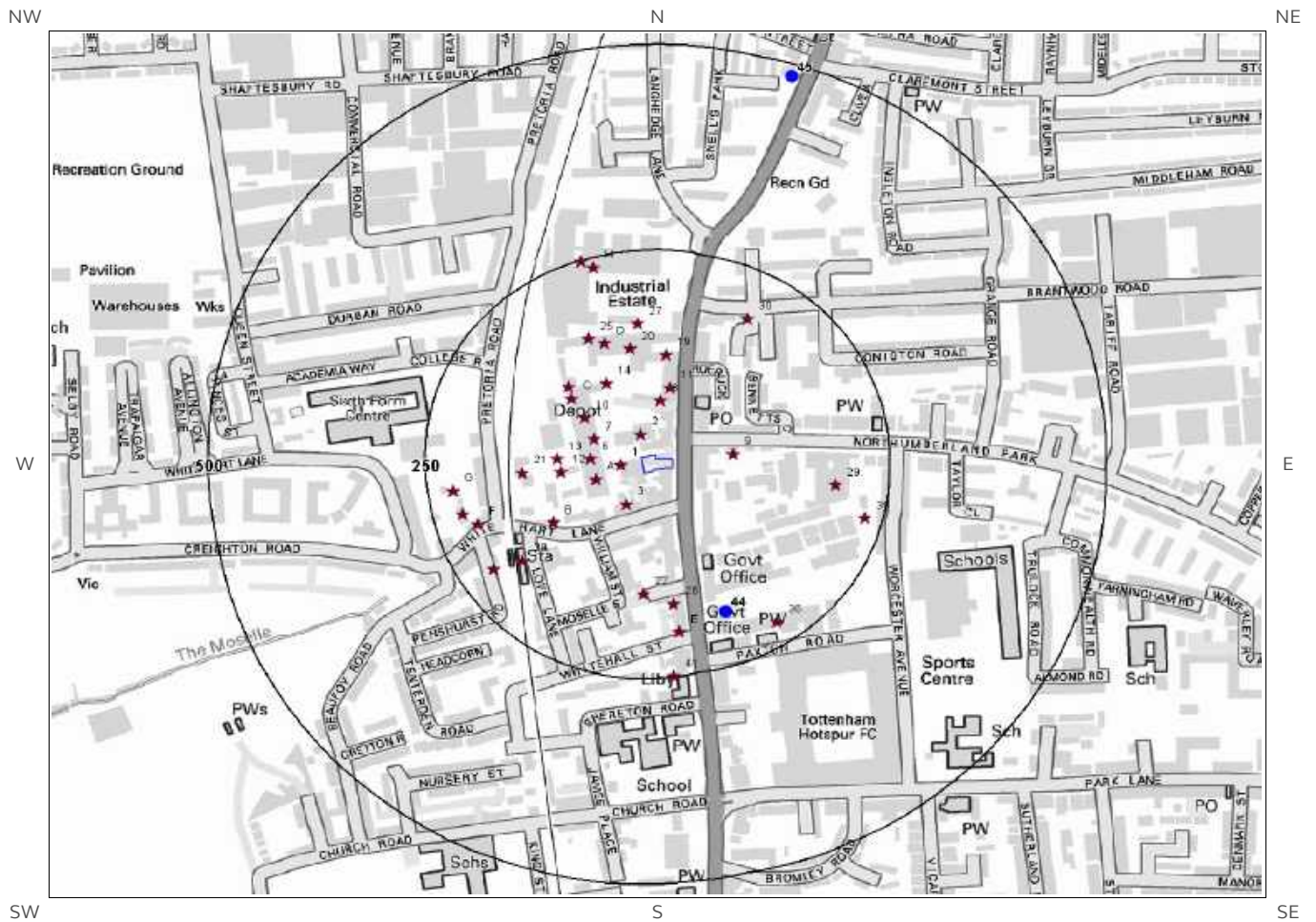
ID	Distance (m)	Direction	NGR	Details	
				Environmental Permitting Regulations (Waste) Licence Number: RED004 EPR reference: - Operator: Redcorn Limited Waste Management licence No: 80343 Annual Tonnage: 0.0	Status: Issued Site Name: Redcorn Limited Correspondence Address: Redcorn Limited, British Rail Sidings, 44, White Hart Lane, Tottenham, London, N17 8DP
Not shown	646	NW	533457 191991	Site Address: Rear Of 160 Bridport Road, Commercial Road, Edmonton, London, N18 1SY Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: HUN007 EPR reference: EA/EPR/MP3593EJ/A001 Operator: Hunt Christopher Joseph Thomas Waste Management licence No: 80772 Annual Tonnage: 24999.0	Issue Date: 06/08/2007 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Hunt Skips, Commercial Road, Edmonton Correspondence Address: -
Not shown	881	E	534698 191743	Site Address: Redcorn, Brantwood Road, Tottenham, London, N17 0ED Type: 75kte Vehicle Depollution Facility Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: RED074 EPR reference: EA/EPR/EB3333AD/A001 Operator: Redcorn Ltd Waste Management licence No: 103763 Annual Tonnage: 74999.0	Issue Date: 20/01/2012 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Redcorn Correspondence Address: -
Not shown	881	E	534698 191743	Site Address: Land/premises At, Brantwood Road, Tottenham, London, N17 0DT Type: Metal Recycling Site (Vehicle Dismantler) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: BRA005 EPR reference: EA/EPR/AP3797NG/A001 Operator: Brantwood Auto Recycling Ltd Waste Management licence No: 80653 Annual Tonnage: 18000.0	Issue Date: 16/11/2005 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Revoked Site Name: Brantwood Auto Breakers Ltd Correspondence Address: -
Not shown	915	E	534731 191753	Site Address: Brantwood House, 175, Willoughby Lane, Tottenham, London, N17 0RX Type: Metal Recycling Site (Vehicle Dismantler) Size: >= 25000 tonnes < 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: BRA006 EPR reference: EA/EPR/SP3493ES/A001 Operator: Brantwood Auto Recycling Limited Waste Management licence No: 80749 Annual Tonnage: 40000.0	Issue Date: 20/12/2006 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Revoked Site Name: Brantwood Willoughby Lane Correspondence Address: -
Not shown	932	E	534750 191750	Site Address: Brantwood Road, Tottenham, London, N17 0DT Type: Metal Recycling Site (Vehicle Dismantler) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: BRA005 EPR reference: - Operator: Brantwood Auto Breakers Ltd Waste Management licence No: 80653 Annual Tonnage: 18000.0	Issue Date: 16/11/2005 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Brantwood Auto Breakers Ltd Correspondence Address: Brantwood Road, Tottenham, London, N17 0DT

ID	Distance (m)	Direction	NGR	Details	
Not shown	959	E	534765 191788	Site Address: 175, Willoughby Lane, Tottenham, London, N17 0RX Type: Metal Recycling Site (Vehicle Dismantler) Size: >= 25000 tonnes < 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: BRA006 EPR reference: - Operator: Brantwood Auto Breakers Limited Waste Management licence No: 80749 Annual Tonnage: 5000.0	Issue Date: 20/12/2006 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Brantwood Tottenham Correspondence Address: 175, Willoughby Lane, Tottenham, London, N17 0RX
Not shown	1004	NW	533262 192291	Site Address: North Middlesex Hospital NHS Trust, Sterling Way, Edmonton, London, N18 1QX Type: In-House Storage Facility Size: Unknown Environmental Permitting Regulations (Waste) Licence Number: TRU002 EPR reference: - Operator: North Middlesex Hospital NHS Trust Waste Management licence No: 80315 Annual Tonnage: 0.0	Issue Date: 30/03/1994 Effective Date: - Modified: - Surrendered Date: 20/04/1998 Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: Watermill Lane, Edmonton Correspondence Address: North Middlesex Hospital NHS Trust, Sterling Way, Edmonton, London, N18 1QX
Not shown	1004	NW	533262 192291	Site Address: North Middlesex Hospital NHS Trust, Sterling Way, Edmonton, London, N18 1QX Type: In-House Storage Facility Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: TRU002 EPR reference: EA/EPR/VP3191NM/S002 Operator: North Middlesex Hospital NHS Trust Waste Management licence No: 80315 Annual Tonnage: 25000.0	Issue Date: 30/03/1994 Effective Date: - Modified: - Surrendered Date: Apr 20 1998 12:00AM Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: Watermill Lane, Edmonton Correspondence Address: -
Not shown	1301	E	535161 191565	Site Address: P Quinn, 81, Garman Road, Tottenham, London, N17 Type: Household, Commercial & Industrial Waste T Stn Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: HAL003 EPR reference: - Operator: Hales Waste Control Ltd Waste Management licence No: 80300 Annual Tonnage: 0.0	Issue Date: 22/09/1992 Effective Date: - Modified: 05/08/1999 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Hales Waste, Garman Road Correspondence Address: Hales Waste Control Limited, 81, Garman Road, Tottenham, London, N17
Not shown	1307	E	535168 191544	Site Address: P Quinn, 81, Garman Road, Tottenham, London, N17 0UN Type: Household, Commercial & Industrial Waste T Stn Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: BIF002 EPR reference: EA/EPR/EP3591NR/V004 Operator: Biffa Waste Services Ltd Waste Management licence No: 80300 Annual Tonnage: 86925.0	Issue Date: 22/09/1992 Effective Date: 18/12/2003 Modified: 31/03/2008 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Garman Road Correspondence Address: -
Not shown	1430	NE	535067 192234	Site Address: Chris Pelosi, Albert Works, Kenninghall Road, Edmonton, London, N18 2PD Type: Metal Recycling Site (mixed MRS's) Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: GDM001 EPR reference: EA/EPR/EP3091NT/V005	Issue Date: 02/06/1992 Effective Date: - Modified: 26/08/2010 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Albert Works

ID	Distance (m)	Direction	NGR	Details
				Operator: Metal & Waste Recycling Group Ltd Waste Management licence No: 80298 Annual Tonnage: 349000.0
Not shown	1430	NE	535067 192234	Correspondence Address: - Issue Date: 02/06/1992 Effective Date: - Modified: 19/01/1993 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: G D Metal Recycling, Edmonton Correspondence Address: GD Metal Recycling Limited, Albert Works, Kenninghall Road, Edmonton, London, N18 2PD
Not shown	1439	S	534358 190098	Site Address: Chris Pelosi, Albert Works, Kenninghall Road, Edmonton, London, N18 2ED Type: Metal Recycling Site (mixed MRS's) Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: GDM001 EPR reference: - Operator: GD Metal Recycling Ltd Waste Management licence No: 80298 Annual Tonnage: 0.0
Not shown	1439	S	534358 190098	Site Address: John Ward, Park View Re-Use & Recycling Centre, Park View Road, Tottenham, London, N17 9AY Type: Household Waste Amenity Site Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: LON266 EPR reference: EA/EPR/MB3135RY/T001 Operator: Londonwaste Limited Waste Management licence No: 80301 Annual Tonnage: 24999.0 Issue Date: 25/01/1995 Effective Date: 11/12/2012 Modified: 06/09/1995 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Transferred Site Name: Park View Re- Use & Recycling Centre Correspondence Address: -
Not shown	1439	S	534358 190098	Site Address: John Ward, Park View Re-Use & Recycling Centre, Park View Road, Tottenham, London, N17 9AY Type: Household Waste Amenity Site Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: HAR003 EPR reference: EA/EPR/EP3891NB/V002 Operator: Haringey London Borough Council Waste Management licence No: 80301 Annual Tonnage: 9458.0 Issue Date: 25/01/1995 Effective Date: - Modified: 06/09/1995 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Park View Re- Use & Recycling Centre Correspondence Address: -
Not shown	1447	S	534376 190096	Site Address: John Ward, Park View Re-Use & Recycling Centre, Park View Road, Tottenham, London, N17 9AY Type: Household Waste Amenity Site Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: LON266 EPR reference: EA/EPR/MB3135RY/T001 Operator: LondonWaste Ltd Waste Management licence No: 80301 Annual Tonnage: 24999.0 Issue Date: 25/01/1995 Effective Date: 11/12/2012 Modified: 06/09/1995 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Transferred Site Name: Park View Re- Use & Recycling Centre Correspondence Address: -
Not shown	1447	S	534376 190096	Site Address: John Ward, Park View Re-Use & Recycling Centre, Park View Road, Tottenham, London, N17 9AY Type: Household Waste Amenity Site Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: LON266 EPR reference: EA/EPR/MB3135RY/S003 Operator: Londonenergy Ltd Waste Management licence No: 80301 Annual Tonnage: 0.0 Issue Date: 25/01/1995 Effective Date: 11/12/2012 Modified: 28/09/2017 Surrendered Date: Apr 18 2019 12:00AM Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: Park View Re- Use & Recycling Centre Correspondence Address: -
Not shown	1492	NE	535094 192304	Site Address: Unit 1, New Park Estate, Edmonton, London, N18 2PD Type: Metal Recycling Site (Vehicle) Issue Date: 28/01/2005 Effective Date: 20/12/2007 Modified: 02/06/2008

ID	Distance (m)	Direction	NGR	Details	
				Dismantler) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: LTR001 EPR reference: EA/EPR/DP3596ST/V003 Operator: London Tyre Recycling Ltd Waste Management licence No: 80631 Annual Tonnage: 12500.0	Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Revoked Site Name: E L V Limited Correspondence Address: -
Not shown	1492	NE	535087 192315	Site Address: Unit 1, New Park Estate, Edmonton, London, N18 2PD Type: Metal Recycling Site (Vehicle Dismantler) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: ELV001 EPR reference: - Operator: E L V Limited Waste Management licence No: 80631 Annual Tonnage: 12500.0	Issue Date: 28/01/2005 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: E L V Limited Correspondence Address: 421, Hertford Road, Enfield, Middlesex, EN3 5PT
Not shown	1492	NE	535087 192315	Site Address: Unit 1, New Park Estate, Edmonton, London, N18 2PD Type: Metal Recycling Site (Vehicle Dismantler) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: ELV001 EPR reference: - Operator: E L V Ltd Waste Management licence No: 80631 Annual Tonnage: 12500.0	Issue Date: 28/01/2005 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: E L V Limited Correspondence Address: Mr Garry Baker, 421, Hertford Road, Enfield, Middlesex, EN3 5PT

4. Current Land Use Map



Site Outline



Current Industrial Sites

Electricity Transmission Cables



Search Buffers (m)



Petrol & Fuel Sites

Gas Transmission Pipelines

4. Current Land Uses

4.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site:

43

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	26	W	Tank	533803 191454	Greater London, N17	Tanks (Generic)	Industrial Features
2	29	N	Works	533826 191491	Greater London, N17	Unspecified Works Or Factories	Industrial Features
3	43	SW	Inspire Print	533810 191406	12, White Hart Lane, London, Greater London, N17 8DP	Published Goods	Industrial Products
4A	57	W	Brittanic Auto Transmissions	533775 191436	Unit 3-4 Peacock Industrial Estate, White Hart Lane, London, Greater London, N17 8DT	Vehicle Components	Industrial Products
5A	57	W	Brittanic Auto Transmissions	533775 191436	Unit 3-4 Peacock Industrial Estate, White Hart Lane, London, Greater London, N17 8DT	Vehicle Repair, Testing and Servicing	Repair and Servicing
6	59	W	G S Motors	533769 191461	Unit 6-8 Peacock Estate, 20-22 White Hart Lane, London, Greater London, N17 8DP	Vehicle Repair, Testing and Servicing	Repair and Servicing
7	60	NW	Santwynn Ltd	533773 191485	12-14 Peacock Estate, White Hart Lane Tottenham, London, Greater London, N17 8DP	Clothing, Components and Accessories	Consumer Products
8	67	N	Maryland Cars	533849 191532	Unit 24 Nesta Works, Brunswick Square, London, Greater London, N17 8ES	Vehicle Repair, Testing and Servicing	Repair and Servicing
9	70	E	Electricity Sub Station	533933 191467	Greater London, N17	Electrical Features	Infrastructure and Facilities
10	82	NW	G A Joinery	533762 191511	Unit 19 Peacock Industrial Estate, White Hart Lane, London, Greater London, N17 8DT	General Construction Supplies	Industrial Products
11	84	N	Elif Boutique	533860 191548	841, High Road, White Hart Lane, London, Greater London, N17 8EY	Clothing, Components and Accessories	Consumer Products
12	95	W	Ink System	533734 191445	Unit 7 Carbery Enterprise Park 36, White Hart Lane, London, Greater London, N17 8DP	Printing Related Machinery	Industrial Products
13	98	W	Depot	533730 191461	Greater London, N17	Container and Storage	Transport, Storage and Delivery
14	100	NW	Electricity Sub Station	533787 191553	Greater London, N17	Electrical Features	Infrastructure and Facilities

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
15C	109	NW	D A H Transport Ltd	533746 191534	Unit 21a Peacock Industrial Estate, White Hart Lane, London, Greater London, N17 8DT	Distribution and Haulage	Transport, Storage and Delivery
16B	121	SW	E L V Solutions Ltd	533726 191383	44, White Hart Lane, London, Greater London, N17 8DP	Scrap Metal Merchants	Recycling Services
17B	121	SW	Redcorn Ltd	533726 191384	44, White Hart Lane, London, Greater London, N17 8DP	Scrap Metal Merchants	Recycling Services
18C	122	NW	Chimney	533743 191549	Greater London, N17	Chimneys	Industrial Features
19	123	N	D W General Wood Machinists Ltd	533856 191588	855-863, High Road, London, Greater London, N17 8EY	Wood Products Including Charcoal, Paper, Card and Board	Industrial Products
20	133	N	Works	533814 191595	Greater London, N17	Unspecified Works Or Factories	Industrial Features
21	139	W	Works	533690 191444	Greater London, N17	Unspecified Works Or Factories	Industrial Features
22	146	S	Electricity Sub Station	533830 191297	Greater London, N17	Electrical Features	Infrastructure and Facilities
23D	146	N	Flo Rite Spray Finishers Ltd	533785 191602	Unit 33-34 Brunswick Square, White Hart Lane, London, Greater London, N17 8DT	Industrial Coatings and Finishings	Industrial Products
24D	157	NW	C & D Metalworks	533766 191607	Unit 31-32 Peacock Industrial Estate, White Hart Lane, London, Greater London, N17 8DT	Metals Manufacturers, Fabricators and Stockholders	Industrial Products
25	157	NW	Makro Teknik	533766 191607	Unit 31-32 Peacock Industrial Estate, White Hart Lane, London, Greater London, N17 8DT	Construction Completion Services	Construction Services
26	161	S	London Appliance & Repair	533865 191285	757, High Road, London, Greater London, N17 8AH	Electrical Equipment Repair and Servicing	Repair and Servicing
27	162	N	Electricity Sub Station	533823 191626	Greater London, N17	Electrical Features	Infrastructure and Facilities
28	177	SW	White Hart Lane Rail Station	533690 191337	Greater London, N17	Railway Stations, Junctions and Halts	Public Transport, Stations and Infrastructure
29	188	E	K & P	534051 191429	Unit 3 12-48, Northumberland Park, London, Greater London, N17 0TX	Furniture	Consumer Products
30	192	NE	Electricity Sub Station	533950 191632	Greater London, N17	Electrical Features	Infrastructure and Facilities
31E	196	S	Tyres & Auto Repairs	533871 191250	743, High Road, London, Greater London, N17 8AH	Vehicle Parts and Accessories	Motoring
32E	196	S	Tyres & Auto Repair Centre	533871 191250	743, High Road, London, Greater London, N17 8AH	Vehicle Repair, Testing and Servicing	Repair and Servicing
33F	202	W	CCTV Securityland	533639 191382	3 White Hart Terrace, White Hart Lane, London, Greater London, N17 8HN	Electronic Equipment	Industrial Products
34	209	SW	Electricity Sub Station	533657 191327	Greater London, N17	Electrical Features	Infrastructure and Facilities

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
35F	216	W	Star Motors	533621 191394	Garage White Hart Terrace, White Hart Lane, London, Greater London, N17 8HN	Vehicle Repair, Testing and Servicing	Repair and Servicing
36	221	SE	Works	533983 191263	Greater London, N17	Unspecified Works Or Factories	Industrial Features
37G	221	W	Commercial Vehicle Sales	533610 191422	72, White Hart Lane, London, Greater London, N17 8HP	Vehicle Hire and Rental	Hire Services
38G	221	W	C V S Van Hire	533610 191422	72, White Hart Lane, London, Greater London, N17 8HP	Vehicle Hire and Rental	Hire Services
39	229	E	Electricity Sub Station	534085 191389	Greater London, N17	Electrical Features	Infrastructure and Facilities
40H	239	N	Factory	533772 191694	Greater London, N17	Unspecified Works Or Factories	Industrial Features
41	248	S	Electricity Sub Station	533864 191197	Greater London, N17	Electrical Features	Infrastructure and Facilities
42H	249	N	Tank	533758 191701	Greater London, N17	Tanks (Generic)	Industrial Features
43H	249	N	Tanks	533758 191701	Greater London, N17	Tanks (Generic)	Industrial Features

4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site:

2

The following petrol or fuel site records provided by Catalist are represented as points on the Current Land Use map:

ID	Distance (m)	Direction	NGR	Company	Address	LPG	Status
44	184	S	533924 191275	TOTAL	776, High Road, Tottenham, London, Inner London, N17 0BX	Not Applicable	Obsolete
45	485	N	534001 191926	BP	57, Fore Street, Upper Edmonton, London, Outer London, N18 2SX	No	Open

4.3 National Grid High Voltage Underground Electricity Transmission Cables

This dataset identifies the high voltage electricity transmission lines running between generating power plants and electricity substations. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site:

0

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

This dataset identifies high-pressure, large diameter pipelines which carry gas between gas terminals, power stations, compressors and storage facilities. The dataset does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses. This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high pressure gas transmission pipelines within 500m of the study site:

0

Database searched and no data found.

5. Geology

5.1 Artificial Ground and Made Ground

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

5.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
KPGR-XSV	KEMPTON PARK GRAVEL MEMBER	SAND AND GRAVEL

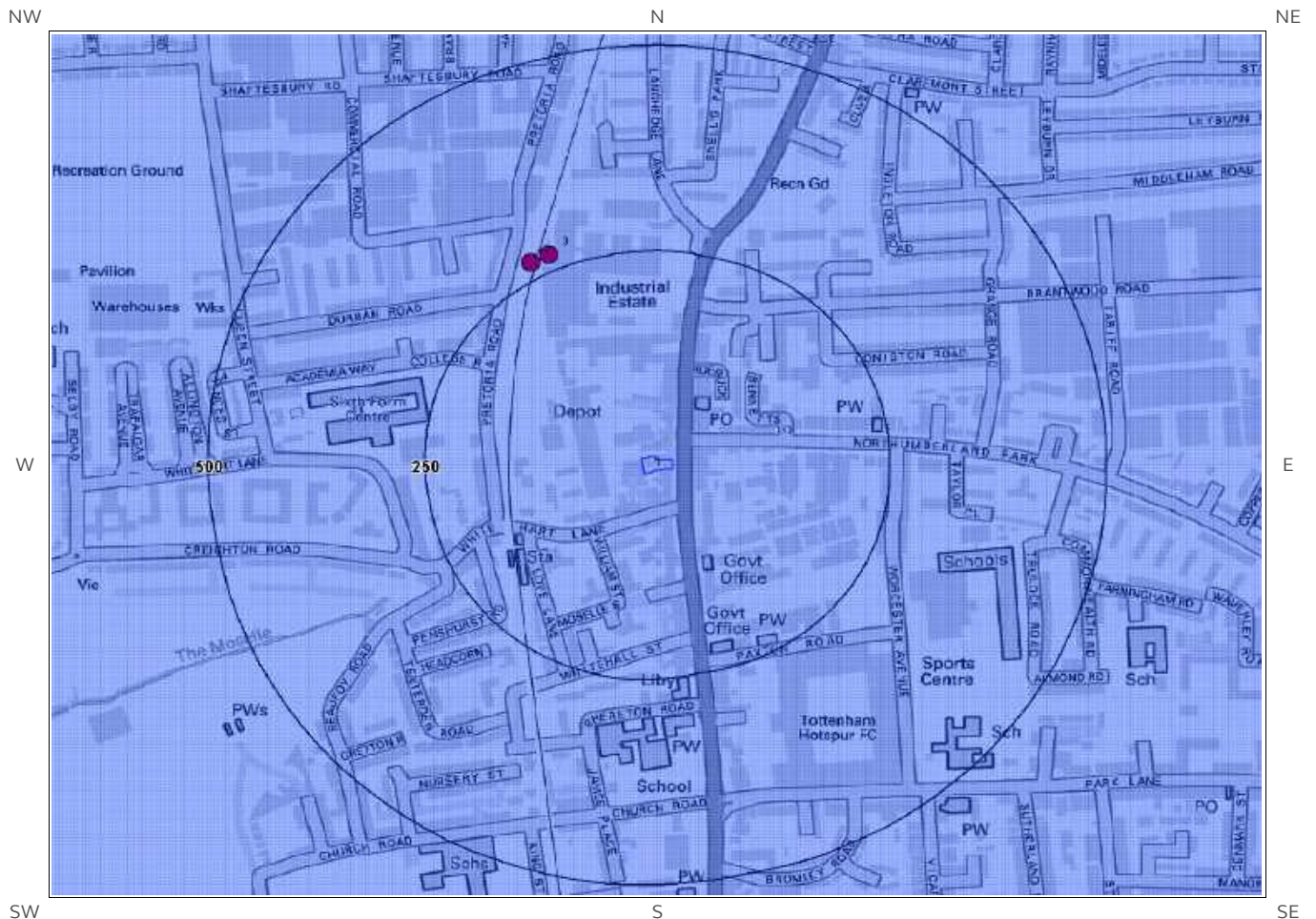
5.3 Bedrock and Solid Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
LC-XCZS	LONDON CLAY FORMATION	CLAY, SILT AND SAND

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

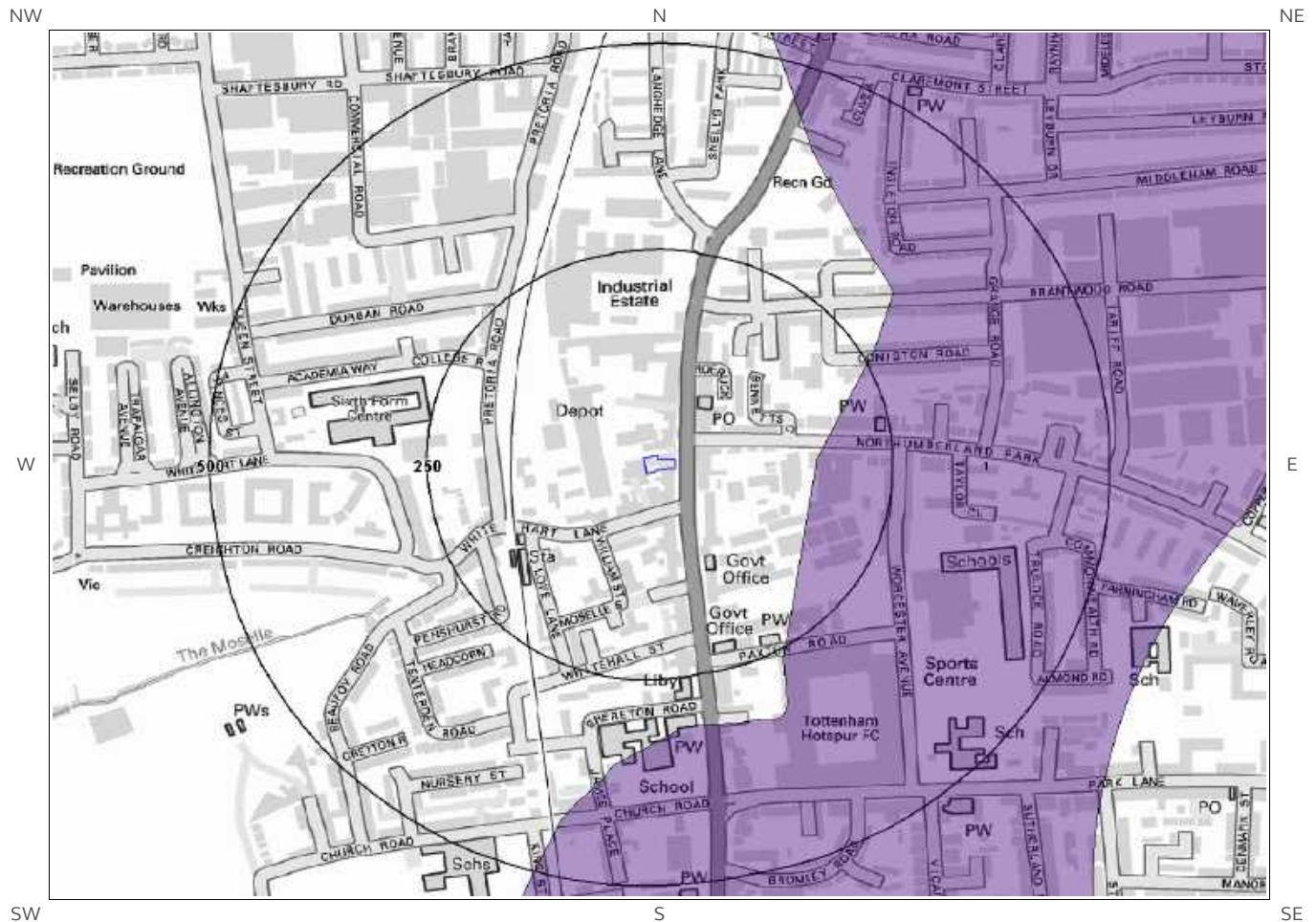
6b. Aquifer Within Bedrock Geology and Abstraction Licences



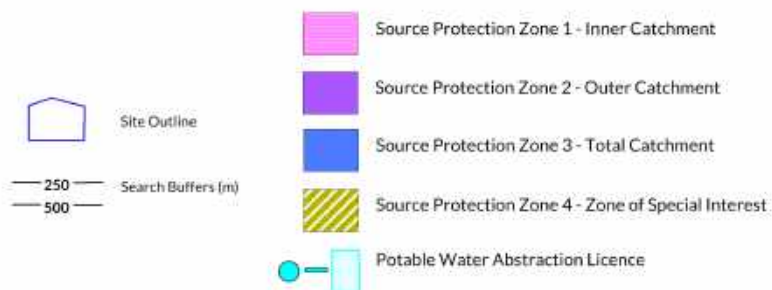
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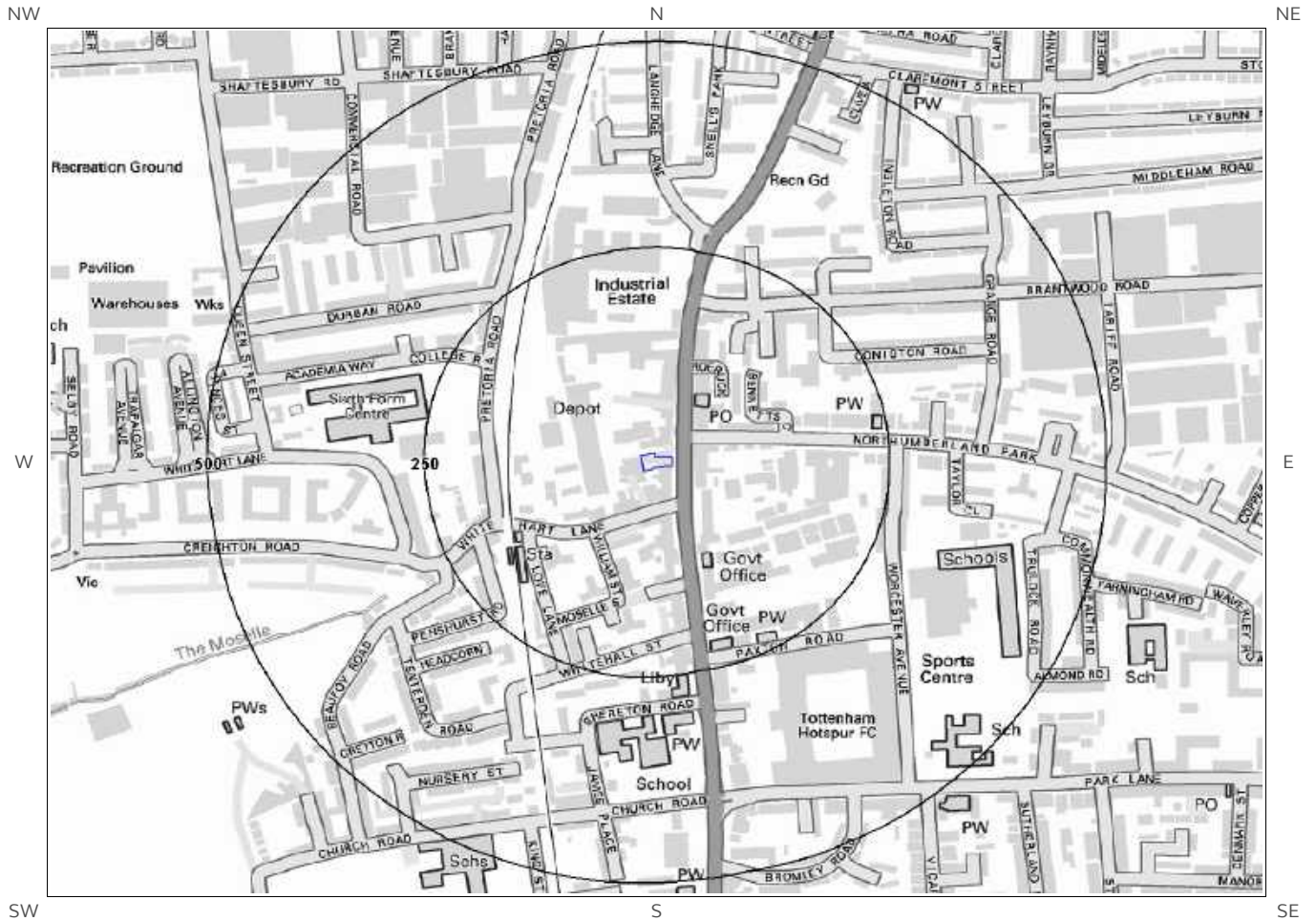
6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licences



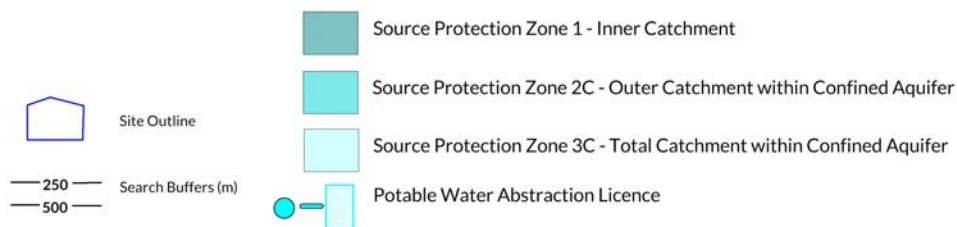
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6d. Hydrogeology – Source Protection Zones within confined aquifer

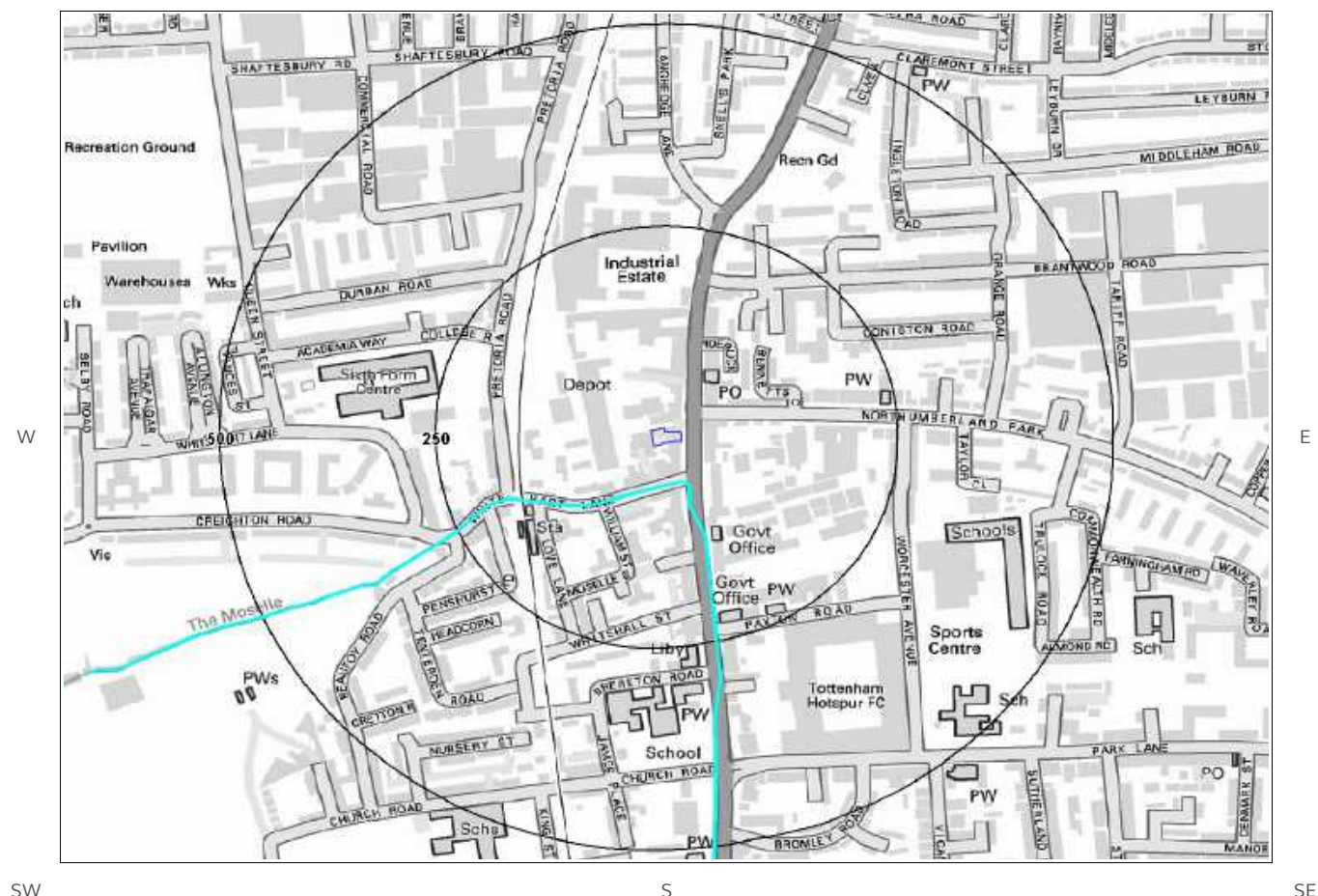


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6e. Hydrology – Watercourse Network and River Quality

NW N NE



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6. Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

Records of strata classification within the superficial geology at or in proximity to the property Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (6a):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	238	SE	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
3	246	NW	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
4	286	SW	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

6.2 Aquifer within Bedrock Deposits

Records of strata classification within the bedrock geology at or in proximity to the property Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

6.3 Groundwater Abstraction Licences

Groundwater Abstraction Licences within 2000m of the study site

Identified

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details
2	270	NW	533700 191700	Status: Historical Licence No: 29/38/09/0072 Details: General Cooling (Existing Licences Only) (High Loss) Direct Source: THAMES GROUNDWATER Point: 881 HIGH ROAD, TOTTENHAM Data Type: Point Name: CANNON RUBBER LTD Annual Volume (m³): 9,092 Max Daily Volume (m³): - Original Application No: - Original Start Date: 20/04/1966 Expiry Date: - Issue No: 100 Version Start Date: 30/12/1977 Version End Date:
3	270	NW	533720 191710	Status: Historical Licence No: 29/38/09/0072 Details: General Cooling (Existing Licences Only) (High Loss) Direct Source: THAMES GROUNDWATER Point: 881 HIGH ROAD, TOTTENHAM-BOREHOLE Data Type: Point Name: CANNON AUTOMOTIVE LTD Annual Volume (m³): 9,092 Max Daily Volume (m³): - Original Application No: - Original Start Date: 20/04/1966 Expiry Date: - Issue No: 102 Version Start Date: 31/05/2005 Version End Date:
Not shown	1142	E	534991 191264	Status: Historical Licence No: TH/038/0009/007 Details: Laundry Use Direct Source: THAMES GROUNDWATER Point: EMPIRE LAUNDRY BOREHOLE Data Type: Point Name: Montagus Ltd Annual Volume (m³): 56,340 Max Daily Volume (m³): 180 Original Application No: - Original Start Date: 27/11/2009 Expiry Date: 31/03/2019 Issue No: 1 Version Start Date: 27/11/2009 Version End Date:
Not shown	1142	E	534991 191264	Status: Active Licence No: TH/038/0009/007/R01 Details: Laundry Use Direct Source: THAMES GROUNDWATER Point: EMPIRE LAUNDRY BOREHOLE Data Type: Point Name: Montagus Ltd Annual Volume (m³): 56,340 Max Daily Volume (m³): 180 Original Application No: - Original Start Date: 01/04/2019 Expiry Date: 31/03/2025 Issue No: 1 Version Start Date: 01/04/2019 Version End Date:
Not shown	1211	E	535010 191850	Status: Historical Licence No: 29/38/09/0189 Details: Pollution Remediation Direct Source: THAMES GROUNDWATER Point: FORMER GAS WORKS, TOTTENHAM-BOREHOLE Data Type: Point Name: SECONDSITE PROPERTY HOLDINGS LTD Annual Volume (m³): 100,000 Max Daily Volume (m³): 408 Original Application No: - Original Start Date: 06/07/2004 Expiry Date: 31/12/2008 Issue No: 1 Version Start Date: 06/07/2004 Version End Date:
Not shown	1263	NE	534780 192330	Status: Historical Licence No: 29/38/09/0181 Details: Pollution Remediation Direct Source: THAMES GROUNDWATER Point: POINT 'A' AT ABERDEEN ROAD, EDMONTON, LONDON. Data Type: Point Name: HIGGINS HOMES LIMITED Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 28/03/2002 Expiry Date: 30/04/2004 Issue No: 1 Version Start Date: 28/03/2002 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1280	SE	535020 190900	Status: Historical Licence No: 29/38/09/0157 Details: Potable Water Supply - Direct Direct Source: THAMES GROUNDWATER Point: PARK WELL - NLARS POINT 26 Data Type: Point Name: THAMES WATER UTILITIES LTD	Annual Volume (m³): 65,700,000 Max Daily Volume (m³): 275,000 Original Application No: - Original Start Date: 26/06/1995 Expiry Date: - Issue No: 103 Version Start Date: 16/10/2007 Version End Date:
Not shown	1312	E	535100 191900	Status: Historical Licence No: 29/38/09/0175 Details: Pollution Remediation Direct Source: THAMES GROUNDWATER Point: WILLOUGHBY LANE, TOTTENHAM - 42 BOREHOLES Data Type: Point Name: SECONDSITE PROPERTY HOLDINGS LTD	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 26/07/2002 Expiry Date: 30/06/2004 Issue No: 2 Version Start Date: 21/10/2002 Version End Date:
Not shown	1579	NE	534700 192800	Status: Historical Licence No: 29/38/09/0184 Details: Laundry Use Direct Source: THAMES GROUNDWATER Point: SINCLAIR LAUNDRY, EDMONTON- POINT A Data Type: Point Name: THE IMPERIAL LONDON HOTELS LTD	Annual Volume (m³): 75,000 Max Daily Volume (m³): - Original Application No: - Original Start Date: 18/12/2003 Expiry Date: 31/03/2013 Issue No: 1 Version Start Date: 18/12/2003 Version End Date:
Not shown	1579	NE	534700 192800	Status: Historical Licence No: 29/38/09/0184 Details: Laundry Use Direct Source: THAMES GROUNDWATER Point: SINCLAIR LAUNDRY, EDMONTON - BOREHOLE Data Type: Point Name: THE IMPERIAL LONDON HOTELS LTD	Annual Volume (m³): 75,000 Max Daily Volume (m³): - Original Application No: - Original Start Date: 18/12/2003 Expiry Date: 31/03/2013 Issue No: 1 Version Start Date: 18/12/2003 Version End Date:
Not shown	1594	NE	534704 192815	Status: Active Licence No: TH/038/0009/037 Details: Laundry Use Direct Source: THAMES GROUNDWATER Point: SINCLAIR LAUNDRY, EDMONTON - BOREHOLE Data Type: Point Name: THE IMPERIAL LONDON HOTELS LTD	Annual Volume (m³): 55,000 Max Daily Volume (m³): 300 Original Application No: - Original Start Date: 03/04/2013 Expiry Date: 31/03/2025 Issue No: 1 Version Start Date: 03/04/2013 Version End Date:
Not shown	1705	NE	535400 192200	Status: Historical Licence No: 29/38/09/0087 Details: Process Water Direct Source: THAMES GROUNDWATER Point: ANGEL ROAD WORKS Data Type: Point Name: GREAT UNIVERSAL STORES LTD	Annual Volume (m³): 16,593 Max Daily Volume (m³): 46 Original Application No: - Original Start Date: 20/06/1966 Expiry Date: - Issue No: 100 Version Start Date: 13/01/1967 Version End Date:
Not shown	1722	NE	535280 192440	Status: Historical Licence No: 29/38/09/0192 Details: Water Bottling Direct Source: THAMES GROUNDWATER Point: COCA COLA, EDMONTON-BOREHOLE B Data Type: Point Name: COCA-COLA ENTERPRISES LTD	Annual Volume (m³): 438,000 Max Daily Volume (m³): - Original Application No: - Original Start Date: 08/02/2005 Expiry Date: 31/03/2013 Issue No: 2 Version Start Date: 08/06/2005 Version End Date:
Not shown	1729	NE	535285 192445	Status: Historical Licence No: TH/038/0009/038 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: THAMES GROUNDWATER Point: COCA COLA, EDMONTON-BOREHOLE B Data Type: Point Name: COCA-COLA ENTERPRISES LTD	Annual Volume (m³): 876,000 Max Daily Volume (m³): 2,400 Original Application No: - Original Start Date: 01/04/2013 Expiry Date: 31/03/2025 Issue No: 2 Version Start Date: 09/10/2014 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1769	NE	535330 192450	Status: Historical Licence No: 29/38/09/0192 Details: Water Bottling Direct Source: THAMES GROUNDWATER Point: COCA COLA, EDMONTON-BOREHOLE Data Type: Point Name: COCA-COLA ENTERPRISES LTD	Annual Volume (m³): 438,000 Max Daily Volume (m³): - Original Application No: - Original Start Date: 08/02/2005 Expiry Date: 31/03/2013 Issue No: 1 Version Start Date: 08/02/2005 Version End Date:
Not shown	1769	NE	535330 192450	Status: Historical Licence No: 29/38/09/0192 Details: Water Bottling Direct Source: THAMES GROUNDWATER Point: COCA COLA, EDMONTON-BOREHOLE A Data Type: Point Name: COCA-COLA ENTERPRISES LTD	Annual Volume (m³): 438,000 Max Daily Volume (m³): - Original Application No: - Original Start Date: 08/02/2005 Expiry Date: 31/03/2013 Issue No: 2 Version Start Date: 08/06/2005 Version End Date:
Not shown	1774	NE	535330 192460	Status: Historical Licence No: 29/38/09/0161 Details: Water Bottling Direct Source: THAMES GROUNDWATER Point: NOBEL ROAD BOREHOLE Data Type: Point Name: COCA-COLA ENTERPRISES LTD	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 25/07/1996 Expiry Date: 31/12/2004 Issue No: 100 Version Start Date: 01/03/2000 Version End Date:
Not shown	1776	NE	535335 192455	Status: Historical Licence No: TH/038/0009/038 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: THAMES GROUNDWATER Point: COCA COLA, EDMONTON-BOREHOLE A Data Type: Point Name: COCA-COLA ENTERPRISES LTD	Annual Volume (m³): 876,000 Max Daily Volume (m³): 2,400 Original Application No: - Original Start Date: 01/04/2013 Expiry Date: 31/03/2025 Issue No: 2 Version Start Date: 09/10/2014 Version End Date:
Not shown	1785	NE	535387 192391	Status: Active Licence No: TH/038/0009/038 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: THAMES GROUNDWATER Point: COCA COLA, EDMONTON - BOREHOLE C Data Type: Point Name: Coca-Cola European Partners Great Britain Ltd	Annual Volume (m³): 876,000 Max Daily Volume (m³): 2,400 Original Application No: - Original Start Date: 01/04/2013 Expiry Date: 31/03/2025 Issue No: 3 Version Start Date: 03/07/2017 Version End Date:
Not shown	1819	NE	535165 192732	Status: Active Licence No: TH/038/0009/039 Details: Process Water Direct Source: THAMES GROUNDWATER Point: EDMONTON CONCRETE PLANT-BOREHOLE Data Type: Point Name: HANSON QUARRY PRODUCTS EUROPE LTD	Annual Volume (m³): 38,000 Max Daily Volume (m³): 174 Original Application No: - Original Start Date: 02/05/2013 Expiry Date: 31/03/2025 Issue No: 1 Version Start Date: 02/05/2013 Version End Date:
Not shown	1829	NE	535180 192730	Status: Historical Licence No: 29/38/08/0264 Details: Process Water Direct Source: THAMES GROUNDWATER Point: EDMONTON CONCRETE PLANT-BOREHOLE Data Type: Point Name: HANSON QUARRY PRODUCTS EUROPE LTD	Annual Volume (m³): 48,024 Max Daily Volume (m³): 174 Original Application No: - Original Start Date: 16/05/2006 Expiry Date: 31/03/2013 Issue No: 2 Version Start Date: 13/08/2012 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1920	NW	532100 192300	Status: Active Licence No: 29/38/09/0006 Details: Non-Evaporative Cooling Direct Source: THAMES GROUNDWATER Point: CHEQUERS WAY, PALMERS GREEN-BOREHOLE A Data Type: Point Name: ARLA FOODS LIMITED	Annual Volume (m³): 951,660 Max Daily Volume (m³): 3,364 Original Application No: - Original Start Date: 20/02/1966 Expiry Date: - Issue No: 102 Version Start Date: 01/04/2011 Version End Date:
Not shown	1920	NW	532100 192300	Status: Historical Licence No: 29/38/09/0006 Details: General use relating to Secondary Category (Medium Loss) Direct Source: THAMES GROUNDWATER Point: CHEQUERS WAY (POINT A) Data Type: Point Name: ARLA FOODS PLC	Annual Volume (m³): 951,660 Max Daily Volume (m³): 3,364 Original Application No: - Original Start Date: 20/02/1966 Expiry Date: - Issue No: 101 Version Start Date: 29/08/2000 Version End Date:
Not shown	1920	NW	532100 192300	Status: Historical Licence No: 29/38/09/0006 Details: Non-Evaporative Cooling Direct Source: THAMES GROUNDWATER Point: CHEQUERS WAY (POINT A) Data Type: Point Name: ARLA FOODS PLC	Annual Volume (m³): 951,660 Max Daily Volume (m³): 3,364 Original Application No: - Original Start Date: 20/02/1966 Expiry Date: - Issue No: 101 Version Start Date: 29/08/2000 Version End Date:
Not shown	1920	NW	532100 192300	Status: Historical Licence No: 29/38/09/0006 Details: Non-Evaporative Cooling Direct Source: THAMES GROUNDWATER Point: CHEQUERS WAY (POINT B) Data Type: Point Name: ARLA FOODS PLC	Annual Volume (m³): 951,660 Max Daily Volume (m³): 3,364 Original Application No: - Original Start Date: 20/02/1966 Expiry Date: - Issue No: 101 Version Start Date: 29/08/2000 Version End Date:
Not shown	1920	NW	532100 192300	Status: Historical Licence No: 29/38/09/0006 Details: General use relating to Secondary Category (Medium Loss) Direct Source: THAMES GROUNDWATER Point: CHEQUERS WAY (POINT B) Data Type: Point Name: ARLA FOODS PLC	Annual Volume (m³): 951,660 Max Daily Volume (m³): 3,364 Original Application No: - Original Start Date: 20/02/1966 Expiry Date: - Issue No: 101 Version Start Date: 29/08/2000 Version End Date:
Not shown	1920	NW	532100 192300	Status: Active Licence No: 29/38/09/0006 Details: Non-Evaporative Cooling Direct Source: THAMES GROUNDWATER Point: CHEQUERS WAY- BOREHOLE B Data Type: Point Name: ARLA FOODS LIMITED	Annual Volume (m³): 951,660 Max Daily Volume (m³): 3,364 Original Application No: - Original Start Date: 20/02/1966 Expiry Date: - Issue No: 102 Version Start Date: 01/04/2011 Version End Date:
Not shown	1920	NW	532100 192300	Status: Active Licence No: 29/38/09/0006 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: THAMES GROUNDWATER Point: CHEQUERS WAY- BOREHOLE B Data Type: Point Name: ARLA FOODS LIMITED	Annual Volume (m³): 951,660 Max Daily Volume (m³): 3,364 Original Application No: - Original Start Date: 20/02/1966 Expiry Date: - Issue No: 102 Version Start Date: 01/04/2011 Version End Date:
Not shown	1920	NW	532100 192300	Status: Active Licence No: 29/38/09/0006 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: THAMES GROUNDWATER Point: CHEQUERS WAY, PALMERS GREEN-BOREHOLE A Data Type: Point Name: ARLA FOODS LIMITED	Annual Volume (m³): 951,660 Max Daily Volume (m³): 3,364 Original Application No: - Original Start Date: 20/02/1966 Expiry Date: - Issue No: 102 Version Start Date: 01/04/2011 Version End Date:

ID	Distance (m)	Direction	NGR	Details
Not shown	1985	SE	535559 190417	Status: Active Licence No: 29/38/09/0157 Details: Potable Water Supply - Direct Direct Source: THAMES GROUNDWATER Point: BLACKHORSE LANE - NLARS POINT 25 Data Type: Point Name: Thames Water Utilities Ltd Annual Volume (m³): 65,700,000 Max Daily Volume (m³): 275,000 Original Application No: - Original Start Date: 26/06/1995 Expiry Date: - Issue No: 104 Version Start Date: 23/07/2013 Version End Date:
Not shown	1996	SE	535550 190380	Status: Historical Licence No: 29/38/09/0157 Details: Potable Water Supply - Direct Direct Source: THAMES GROUNDWATER Point: LOCKWOOD RESERVOIR - NLARS POINT 25 Data Type: Point Name: THAMES WATER UTILITIES LTD Annual Volume (m³): 65,700,000 Max Daily Volume (m³): 275,000 Original Application No: - Original Start Date: 26/06/1995 Expiry Date: - Issue No: 103 Version Start Date: 16/10/2007 Version End Date:

6.4 Surface Water Abstraction Licences

Surface Water Abstraction Licences within 2000m of the study site

None identified

Database searched and no data found.

6.5 Potable Water Abstraction Licences

Potable Water Abstraction Licences within 2000m of the study site

Identified

The following Potable Water Abstraction Licences records are represented as points, lines and regions on the SPZ and Potable Water Abstraction Licences Map (6c):

ID	Distance (m)	Direction	NGR	Details
Not shown	1280	SE	535020 190900	Status: Historical Licence No: 29/38/09/0157 Details: Potable Water Supply - Direct Direct Source: THAMES GROUNDWATER Point: PARK WELL - NLARS POINT 26 Data Type: Point Name: THAMES WATER UTILITIES LTD Annual Volume (m³): 65,700,000 Max Daily Volume (m³): 275,000 Original Application No: - Original Start Date: 26/06/1995 Expiry Date: - Issue No: 103 Version Start Date: Version End Date:
Not shown	1722	NE	535280 192440	Status: Historical Licence No: 29/38/09/0192 Details: Water Bottling Direct Source: THAMES GROUNDWATER Point: COCA COLA, EDMONTON-BOREHOLE B Data Type: Point Name: COCA-COLA ENTERPRISES LTD Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 08/02/2005 Expiry Date: 31/03/2013 Issue No: 2 Version Start Date: Version End Date:
Not shown	1769	NE	535330 192450	Status: Historical Licence No: 29/38/09/0192 Details: Water Bottling Direct Source: THAMES GROUNDWATER Point: COCA COLA, EDMONTON-BOREHOLE A Data Type: Point Name: COCA-COLA ENTERPRISES LTD Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 08/02/2005 Expiry Date: 31/03/2013 Issue No: 2 Version Start Date: Version End Date:

ID	Distance (m)	Direction	NGR	Details
Not shown	1769	NE	535330 192450	Status: Historical Licence No: 29/38/09/0192 Details: Water Bottling Direct Source: THAMES GROUNDWATER Point: COCA COLA, EDMONTON-BOREHOLE Data Type: Point Name: COCA-COLA ENTERPRISES LTD Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 08/02/2005 Expiry Date: 31/03/2013 Issue No: 1 Version Start Date: Version End Date:
Not shown	1774	NE	535330 192460	Status: Historical Licence No: 29/38/09/0161 Details: Water Bottling Direct Source: THAMES GROUNDWATER Point: NOBEL ROAD BOREHOLE Data Type: Point Name: COCA-COLA ENTERPRISES LTD Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 25/07/1996 Expiry Date: 31/12/2004 Issue No: 100 Version Start Date: Version End Date:
Not shown	1985	SE	535559 190417	Status: Active Licence No: 29/38/09/0157 Details: Potable Water Supply - Direct Direct Source: THAMES GROUNDWATER Point: BLACKHORSE LANE - NLARS POINT 25 Data Type: Point Name: Thames Water Utilities Ltd Annual Volume (m³): 65,700,000 Max Daily Volume (m³): 275,000 Original Application No: - Original Start Date: 26/06/1995 Expiry Date: - Issue No: 104 Version Start Date: Version End Date:
Not shown	1996	SE	535550 190380	Status: Historical Licence No: 29/38/09/0157 Details: Potable Water Supply - Direct Direct Source: THAMES GROUNDWATER Point: LOCKWOOD RESERVOIR - NLARS POINT 25 Data Type: Point Name: THAMES WATER UTILITIES LTD Annual Volume (m³): 65,700,000 Max Daily Volume (m³): 275,000 Original Application No: - Original Start Date: 26/06/1995 Expiry Date: - Issue No: 103 Version Start Date: Version End Date:

6.6 Source Protection Zones

Source Protection Zones within 500m of the study site

Identified

The following Source Protection Zones records are represented on the SPZ and Potable Water Abstraction Map (6c):

ID	Distance (m)	Direction	Zone	Description
1	159	E	2	Outer catchment

6.7 Source Protection Zones within Confined Aquifer

Source Protection Zones within the Confined Aquifer within 500m of the study site None identified

Historically, Source Protection Zone maps have been focused on regulation of activities which occur at or near the ground surface, such as prevention of point source pollution and bacterial contamination of water supplies. Sources in confined aquifers were often considered to be protected from these surface pressures due to the presence of a low permeability confining layer (e.g. glacial till, clay). The increased interest in subsurface activities such as onshore oil and gas exploration, ground source heating and cooling requires protection zones for confined sources to be marked on SPZ maps where this has not already been done.

Database searched and no data found.

6.8 Groundwater Vulnerability and Soil Leaching Potential

Environment Agency/Natural Resources Wales information on groundwater vulnerability and soil leaching potential within 500m of the study site Identified

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Minor Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.

6.9 River Quality

Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site None identified

6.9.1 Biological Quality:

Database searched and no data found.

6.9.2 Chemical Quality:

Database searched and no data found.

6.10 Ordnance Survey MasterMap Water Network

Ordnance Survey MasterMap Water Network entries within 500m of the study site

This watercourse information is provided by Ordnance Survey MasterMap Water Network. The data provides a detailed centre line following the curve of the waterway precisely, so all distances provided in the report should be understood as measurements to the centreline rather than a measurement to the nearest point of the watercourse. Underground watercourses are inferred from entry and exit points so caution is advised in using these to indicate precise locations of underground watercourses when planning site investigation and development.

The following Ordnance Survey MasterMap Water Network records are represented on the Hydrology Map (6e):

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
1	49 S	The Moselle Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
13	49 S	The Moselle Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
2	333 SW	The Moselle Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
14	333 SW	The Moselle Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
3	335 SW	The Moselle Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.8
15	335 SW	The Moselle Alternative Name: -	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.8

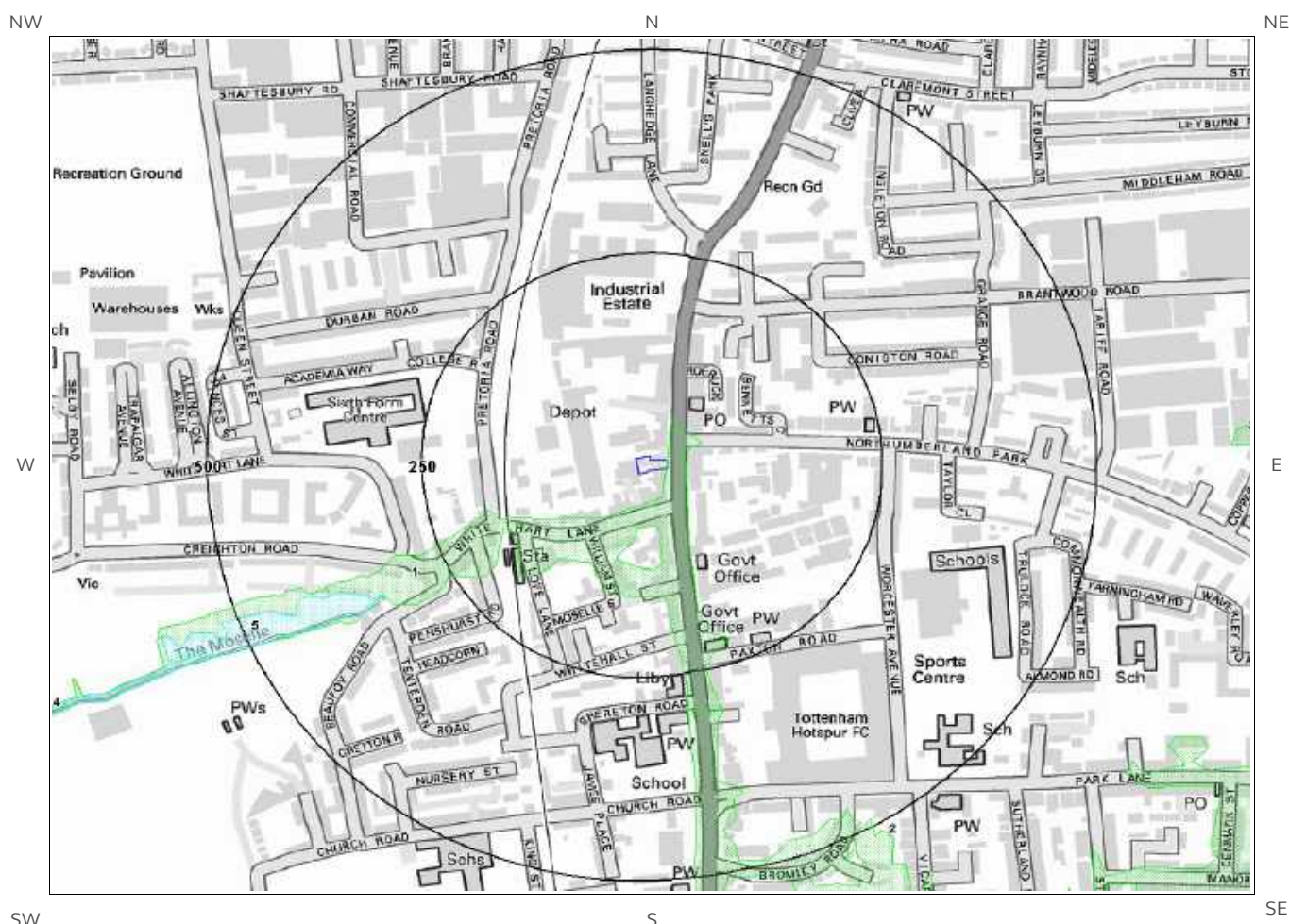
6.11 Surface Water Features

Surface water features within 250m of the study site

None identified

Database searched and no data found.

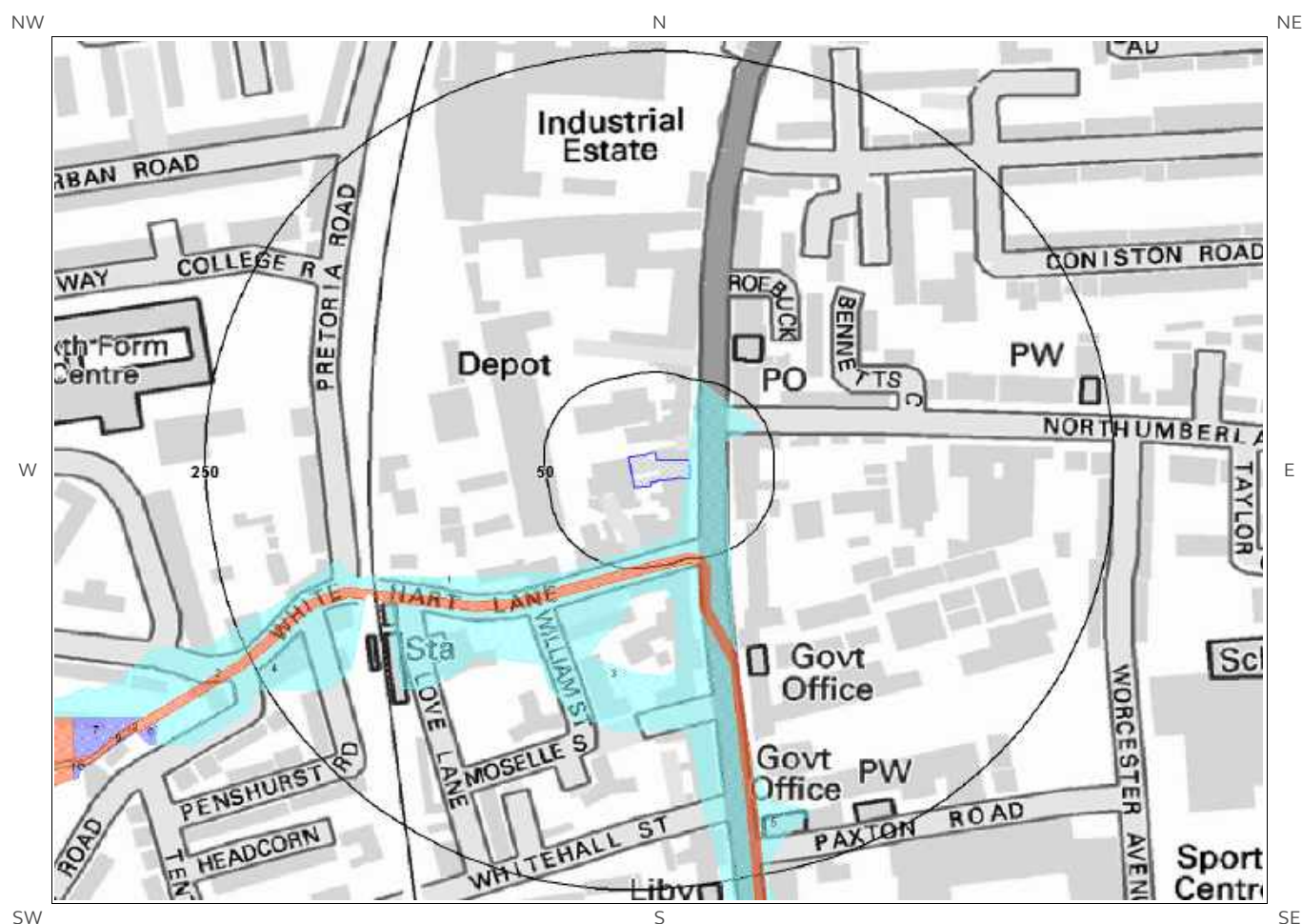
7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea)



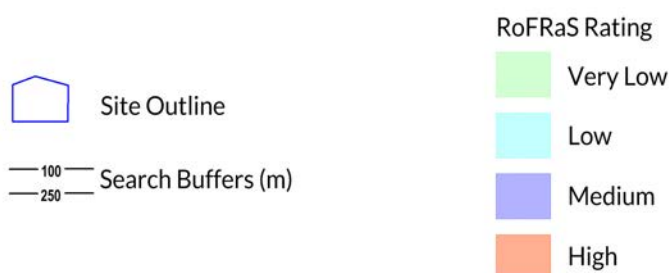
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7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map



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7 Flooding

7.1 River and Coastal Zone 2 Flooding

Environment Agency/Natural Resources Wales Zone 2 floodplain within 250m

Identified

Environment Agency/Natural Resources Wales Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 7a – Flood Map for Planning:

ID	Distance (m)	Direction	Update	Type
1	0	On Site	19-Nov-2019	Zone 2 - (Fluvial /Tidal Models)

7.2 River and Coastal Zone 3 Flooding

Environment Agency/Natural Resources Wales Zone 3 floodplain within 250m

None identified

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 7a – Flood Map for Planning.

7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating

Highest risk of flooding onsite

Low

The Environment Agency/Natural Resources Wales RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection.

RoFRaS data for the study site indicates the property is in an area with a Low (greater than 1 in 1000 but less than 1 in 100) chance of flooding in any given year.

Any relevant data within 250m is represented on the RoFRaS Flood map. Data to 50m is reported in the table below.

ID	Distance (m)	Direction	RoFRaS flood Risk
1	0.0	On Site	Low
2	46.0	S	High

Flood Defences within 250m of the study site	None identified
Database searched and no data found.	

7.5 Areas benefiting from Flood Defences

Areas benefiting from Flood Defences within 250m of the study site	None identified
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7.6 Areas benefiting from Flood Storage

Areas used for Flood Storage within 250m of the study site	None identified
--	-----------------

7.7 Groundwater Flooding Susceptibility Areas

7.7.1 British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site	Identified
--	------------

Clearwater Flooding or Superficial Deposits Flooding	Superficial Deposits Flooding
--	-------------------------------

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

7.7.2 Highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions	
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Potential at Surface

Where potential for groundwater flooding to occur at surface is indicated, this means that given the geological conditions in the area groundwater flooding hazard should be considered in all land-use planning decisions. It is recommended that other relevant information e.g. records of previous incidence of groundwater flooding, rainfall, property type, and land drainage information be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

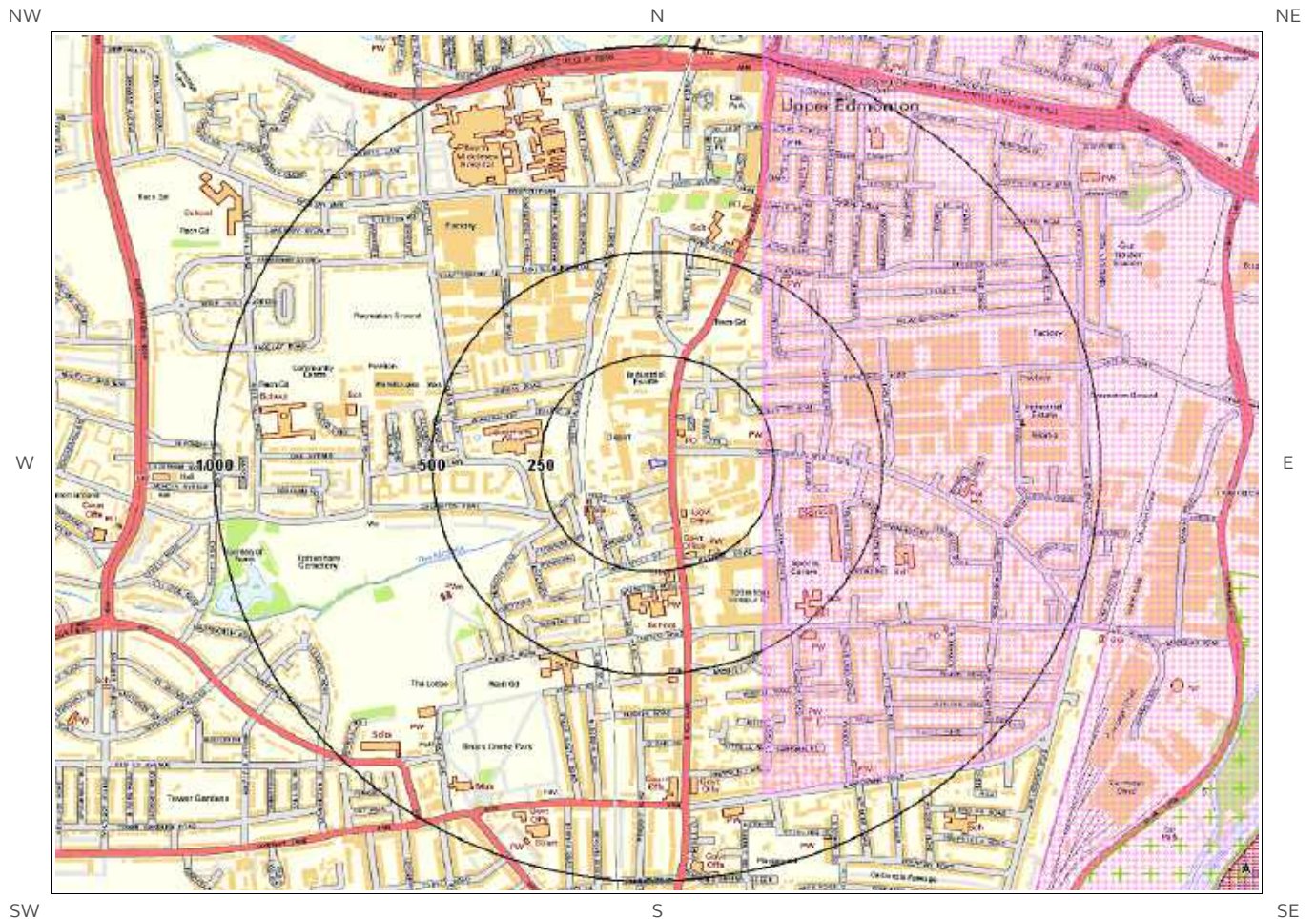
7.8 Groundwater Flooding Confidence Areas

British Geological Survey confidence rating in this result	Moderate
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Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

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

8. Designated Environmentally Sensitive Sites Map



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8. Designated Environmentally Sensitive Sites

Designated Environmentally Sensitive Sites within 2000m of the study site

Identified

8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:

1

The following Site of Special Scientific Interest (SSSI) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	SSSI Name	Data Source
2A	1622	SE	Walthamstow Reservoirs	Natural England

8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:

0

Database searched and no data found.

8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:

0

Database searched and no data found.

8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:

1

The following Special Protection Area (SPA) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	SPA Name	Data Source
1A	1622	SE	Lee Valley	Natural England

8.5 Records of Ramsar sites within 2000m of the study site:

1

The following Ramsar records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	Ramsar Site Name	Ramsar Site Status	Data Source
3A	1622	SE	Lee Valley	Listed	Natural England

8.6 Records of Ancient Woodland within 2000m of the study site:

0

Database searched and no data found.

8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

0

Database searched and no data found.

8.8 Records of World Heritage Sites within 2000m of the study site:

0

Database searched and no data found.

8.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

0

Database searched and no data found.

8.11 Records of National Parks (NP) within 2000m of the study site:

0

Database searched and no data found.

8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

1

The following Nitrate Vulnerable Zone records produced by DEFRA are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	NVZ Name	Data Source
4	228	E	Existing	DEFRA

8.14 Records of Green Belt land within 2000m of the study site:

5

Green Belt data contains Ordnance Survey data © Crown copyright and database right [2015].

ID	Distance	Direction	Green Belt Name	Local Authority Name
5	1322	E	London Area Greenbelt	Haringey London Boro
6	1614	SE	London Area Greenbelt	Waltham Forest London Boro
Not shown	1724	SE	London Area Greenbelt	Haringey London Boro
Not shown	1843	SE	London Area Greenbelt	Waltham Forest London Boro
Not shown	1857	E	London Area Greenbelt	Enfield London Boro

9. Natural Hazards Findings

9.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a **Groundsure Geo Insight**, available from our **website**. The following information has been found:

9.1.1 Shrink Swell

Maximum Shrink-Swell** hazard rating identified on the study site Moderate

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Ground conditions predominantly high plasticity. Do not plant or remove trees or shrubs near to buildings without expert advice about their effect and management. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a probable increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a probable increase in insurance risk during droughts or where vegetation with high moisture demands is present.

9.1.2 Landslides

Maximum Landslide* hazard rating identified on the study site Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

9.1.3 Soluble Rocks

Maximum Soluble Rocks* hazard rating identified on the study site Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

* This indicates an automatically generated 50m buffer and site.

9.1.4 Compressible Ground

Maximum Compressible Ground* hazard rating identified on the study site

Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

9.1.5 Collapsible Rocks

Maximum Collapsible Rocks* hazard rating identified on the study site

Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

9.1.6 Running Sand

Maximum Running Sand** hazard rating identified on the study site

Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

* This indicates an automatically generated 50m buffer and site.

9.2 Radon

9.2.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

9.2.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

10. Mining

10.1 Coal Mining

Coal mining areas within 75m of the study site

None identified

Database searched and no data found.

10.2 Non-Coal Mining

Non-Coal Mining areas within 50m of the study site boundary

None identified

Database searched and no data found.

10.3 Brine Affected Areas

Brine affected areas within 75m of the study site

None identified

Guidance: No Guidance Required.

Contact Details

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The Coal Authority

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Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk



Ordnance Survey

Adanac Drive, Southampton
SO16 0AS
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Local Authority

Authority: London Borough of Haringey
Phone: 020 8489 1000
Web: <http://www.haringey.gov.uk/>
Address: Civic Centre, High Road, London, N22 8LE

Gemapping PLC

Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444



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<https://www.groundsure.com/terms-and-conditions-feb11-2019>



Waterman Infrastructure & Environment
Limited

Report Reference: WTM1-6500721

PICKFORDS WHARF WATERMAN GROUP,
CLINK STREET,
LONDON, SE1 9DG

Your Reference: WIE16362_-_PO_REQ101717

Report Date 4 Dec 2019

Report Delivery Email - pdf
Method:

Geo Insight

Address: FLAT 1, 807, HIGH ROAD, TOTTENHAM, LONDON, N17 8ER

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Geo Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159 000, queries: info@groundsure.com quoting the above report reference number

Yours faithfully,

Waterman

Enc.
Groundsure Geo Insight

Address: FLAT 1, 807, HIGH ROAD, TOTTENHAM, LONDON, N17 8ER

Date: 4 Dec 2019

Reference: WTM1-6500721

Client: Waterman Infrastructure & Environment Limited

NW N NE



SW S SE

Aerial Photograph Capture date: 12-Aug-2016

Grid Reference: 533846,191455

Site Size: 0.0515ha

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Overview of Findings

The Groundsure Geo Insight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 and 1:10,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Non-coal mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and Groundsure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Geology 1:10,000 Scale

1.1 Artificial Ground	1.1 Is there any Artificial Ground/ Made Ground present beneath the study site at 1:10,000 scale?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site at 1:10,000 scale?*	Yes
	1.2.2 Are there any records of landslide within 500m of the study site boundary at 1:10,000 scale?	No
1.3 Bedrock, Solid Geology and linear features	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale?	No

Section 2: Geology 1:50,000 Scale

2.1 Artificial Ground	2.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	2.1.2 Are there any records relating to permeability of artificial ground within the study site*boundary?	No
2.2 Superficial Geology and Landslips	2.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*	Yes
	2.2.2 Are there any records of permeability of superficial ground within 500m of the study site?	Yes
	2.2.3 Are there any records of landslide within 500m of the study site boundary?	No
	2.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No

Section 2: Geology 1:50,000 Scale

2.3 Bedrock, Solid Geology and linear features

2.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.

2.3.2 Are there any records relating to permeability of bedrock ground within the study site boundary?

Yes

2.3.3 Are there any records of linear features within 500m of the study site boundary?

No

Section 3: Radon

3. Radon

3.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?

The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

3.2 Radon Protection

No radon protective measures are necessary.

Section 4: Ground Workings

	On-site	0-50m	51-250	251-500	501-1000
4.1 Historical Surface Ground Working Features from Small Scale Mapping	0	0	2	Not Searched	Not Searched
4.2 Historical Underground Workings from Small Scale Mapping	0	0	0	0	0
4.3 Current Ground Workings	0	0	0	0	4

Section 5: Mining, Extraction & Natural Cavities

	On-site	0-50m	51-250	251-500	501-1000
5.1 Historical Mining	0	0	0	0	0
5.2 Coal Mining	0	0	0	0	0
5.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
5.4 Non-Coal Mining*	0	0	0	0	0
5.5 Non-Coal Mining Cavities	0	0	0	0	0
5.5 Natural Cavities	0	0	0	0	0

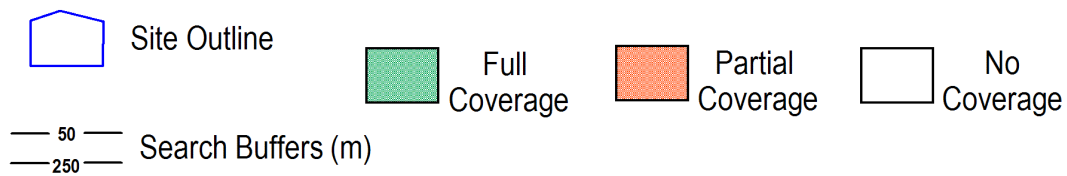
Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.6 Brine Extraction	0	0	0	0	0
5.7 Gypsum Extraction	0	0	0	0	0
5.8 Cornwall and Devon Metalliferous Mining	0	0	0	0	0
5.9 Clay Mining	0	0	0	0	0
Section 6: Natural Ground Subsidence	On-site				
6.1 Shrink-Swell Clay	Moderate				
6.2 Landslides	Very Low				
6.3 Ground Dissolution of Soluble Rocks	Negligible				
6.4 Compressible Deposits	Negligible				
6.5 Collapsible Deposits	Very Low				
6.5 Running Sand	Very Low				
Section 7: Borehole Records	On-site	0-50m	51-250		
7 BGS Recorded Boreholes	0	0	3		
Section 8: Estimated Background Soil Chemistry	On-site	0-50m	51-250		
8 Records of Background Soil Chemistry	1	1	0		
Section 9: Railways and Tunnels	On-site	0-50m	51-250	250-500	
9.1 Tunnels	0	0	0	Not Searched	
9.2 Historical Railway and Tunnel Features	0	0	44	Not Searched	
9.3 Historical Railways	0	0	0	Not Searched	
9.4 Active Railways	0	0	14	Not Searched	
9.5 Railway Projects	0	0	0	0	

1:10,000 Scale Availability



1_10,000 Availability Legend

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Availability of 1:10,000 Scale Geology Mapping

The following information represents the availability of the key components of the 1:10,000 scale geological data.

ID	Distance	Artificial Coverage	Superficial Coverage	Bedrock Coverage	Mass Movement Coverage
1	0.0	Some deposits are mapped	Full	Full	No coverage
2	1136.0	Some deposits are mapped	Full	Full	No coverage
N3	1443.0	Some deposits are mapped	Full	Full	No coverage
N4	1841.0	Some deposits are mapped	Full	Full	No coverage

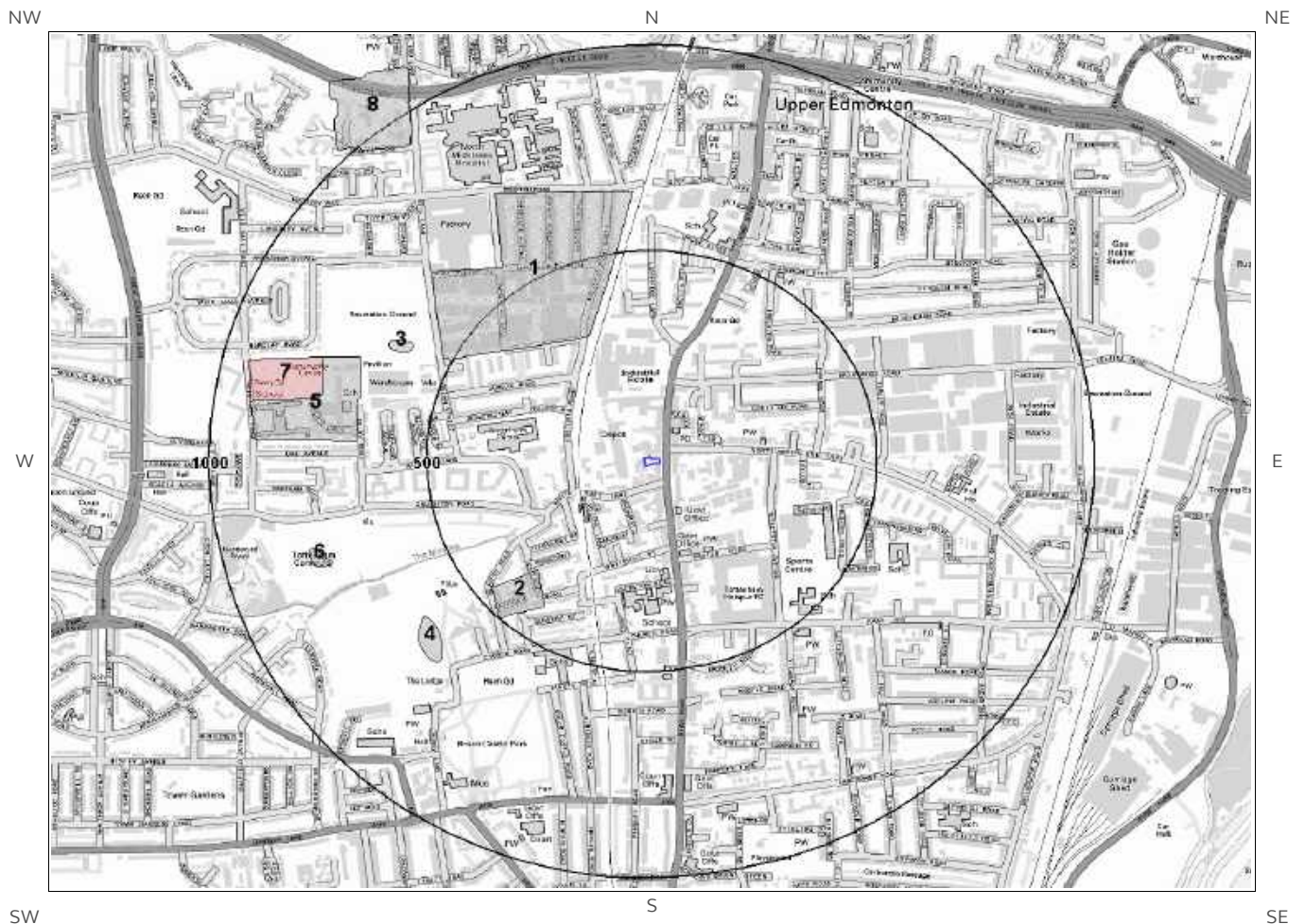
Guidance: The 1:10,000 scale geological interpretation is the most detailed generally available from BGS and is the scale at which most geological surveying is carried out in the field. The database is presented as four types of geology (artificial, mass movement, superficial and bedrock), although not all themes are mapped or available on every map sheet. Therefore a coverage layer showing the availability of the four themes is presented above.

The definitions of coverage are as follows:

Geology	Full Coverage	Partial Coverage	No Coverage
Bedrock	The whole tile has been mapped	Some but not all the tile has been mapped	No coverage
Superficial	The whole tile has been mapped	Some but not all of the tile has been mapped	No coverage
Artificial	Some deposits are mapped on this tile	-	No deposits are mapped
Mass Movement	Some deposits are mapped on this tile	-	No coverage

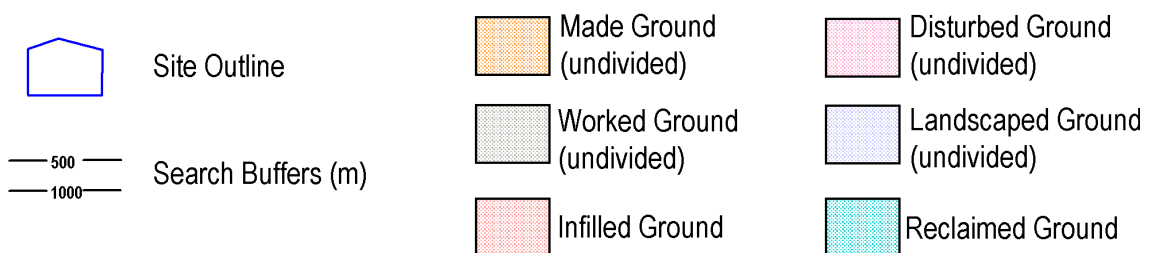
1 Geology (1:10,000 scale).

1.1 Artificial Ground map (1:10,000 scale)



Artificial Ground Legend

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1. Geology 1:10,000 scale

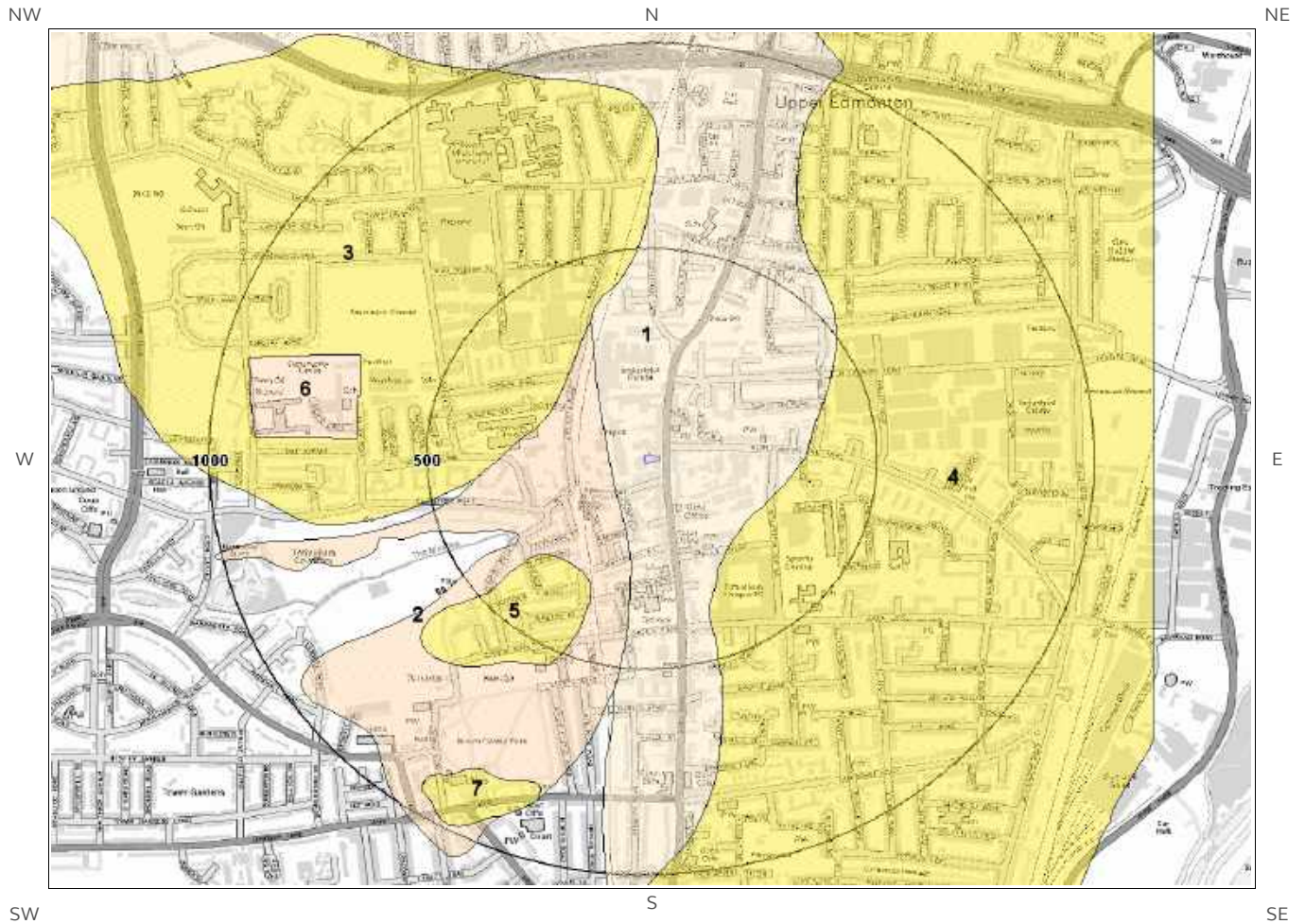
1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

Are there any records of Artificial/ Made Ground within 500m of the study site boundary at 1:10,000 scale? Yes

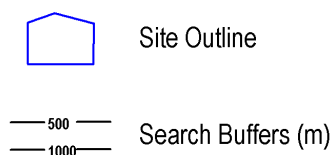
ID	Distance	Direction	LEX Code	Description	Rock Description
1	324.0	NW	WGR- UNKNOWN	Worked Ground (Undivided)	Unknown/unclassified Entry
2	353.0	SW	WGR- UNKNOWN	Worked Ground (Undivided)	Unknown/unclassified Entry

1.2 Superficial Deposits and Landslips map (1:10,000 scale)



Artificial Ground Legend

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1.2 Superficial Deposits and Landslips

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary at 1:10,000 scale? Yes

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	KPGR-XSV	Kempton Park Gravel Formation - Sand And Gravel	Sand And Gravel
2	80.0	W	TPGR-XSV	Taplow Gravel Formation - Sand And Gravel	Sand And Gravel
3	239.0	NW	ESI-Z	Enfield Silt Member - Silt	Silt
4	246.0	SE	ESI-Z	Enfield Silt Member - Silt	Silt
5	297.0	SW	ESI-Z	Enfield Silt Member - Silt	Silt

1.2.2 Landslip

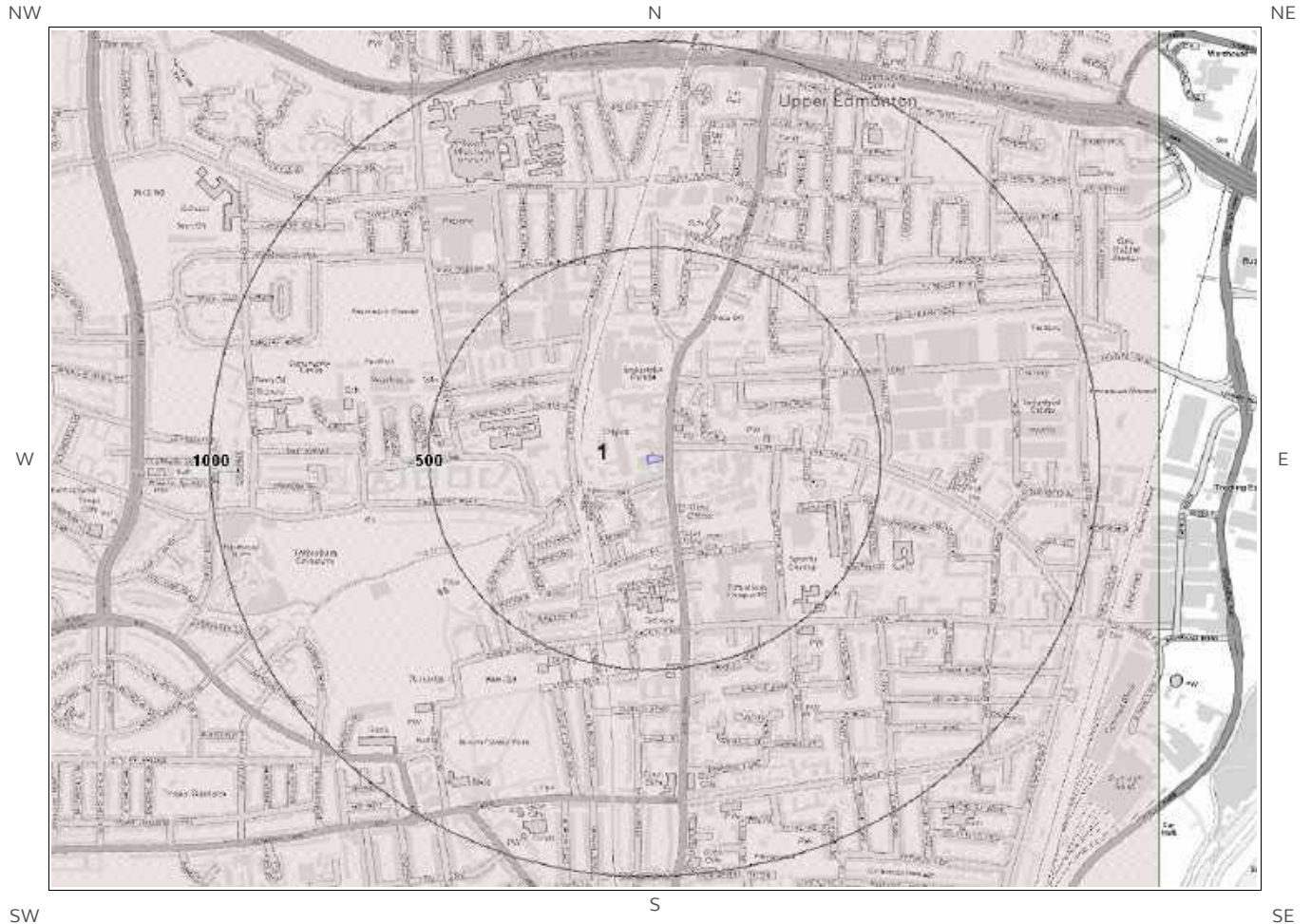
Are there any records of Landslip within 500m of the study site boundary at 1:10,000 scale? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:10,000 scale

This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.3 Bedrock and linear features map (1:10,000 scale)

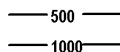


Bedrock and linear features Legend

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Site Outline



Search Buffers (m)

1.3 Bedrock and linear features

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

1.3.1 Bedrock/ Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary at 1:10,000 scale.

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	0.0	On Site	LC-CLAY	London Clay Formation - Clay	Eocene Epoch

1.3.2 Linear features

Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale? No

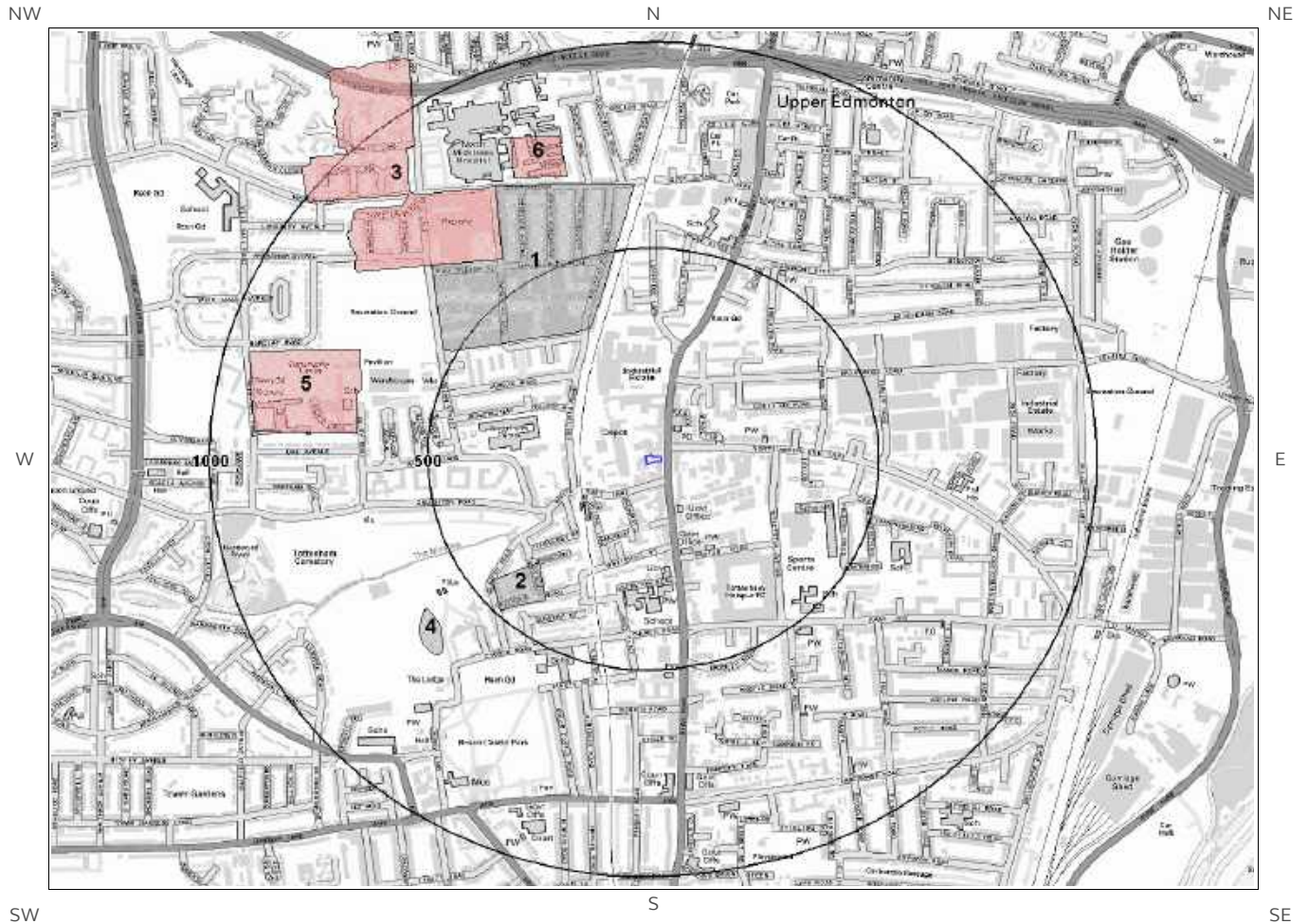
Database searched and no data found at this scale.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of great Britain at 1:10,000 scale.

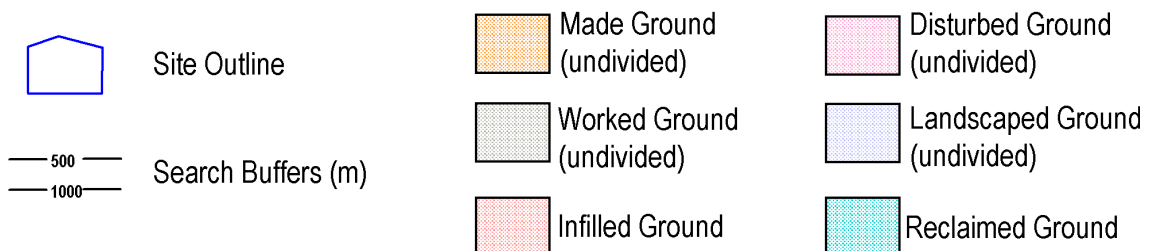
This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2 Geology 1:50,000 Scale

2.1 Artificial Ground map



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2. Geology 1:50,000 scale

2.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 256

2.1.1 Artificial/ Made Ground

Are there any records of Artificial/ Made Ground within 500m of the study site boundary? Yes

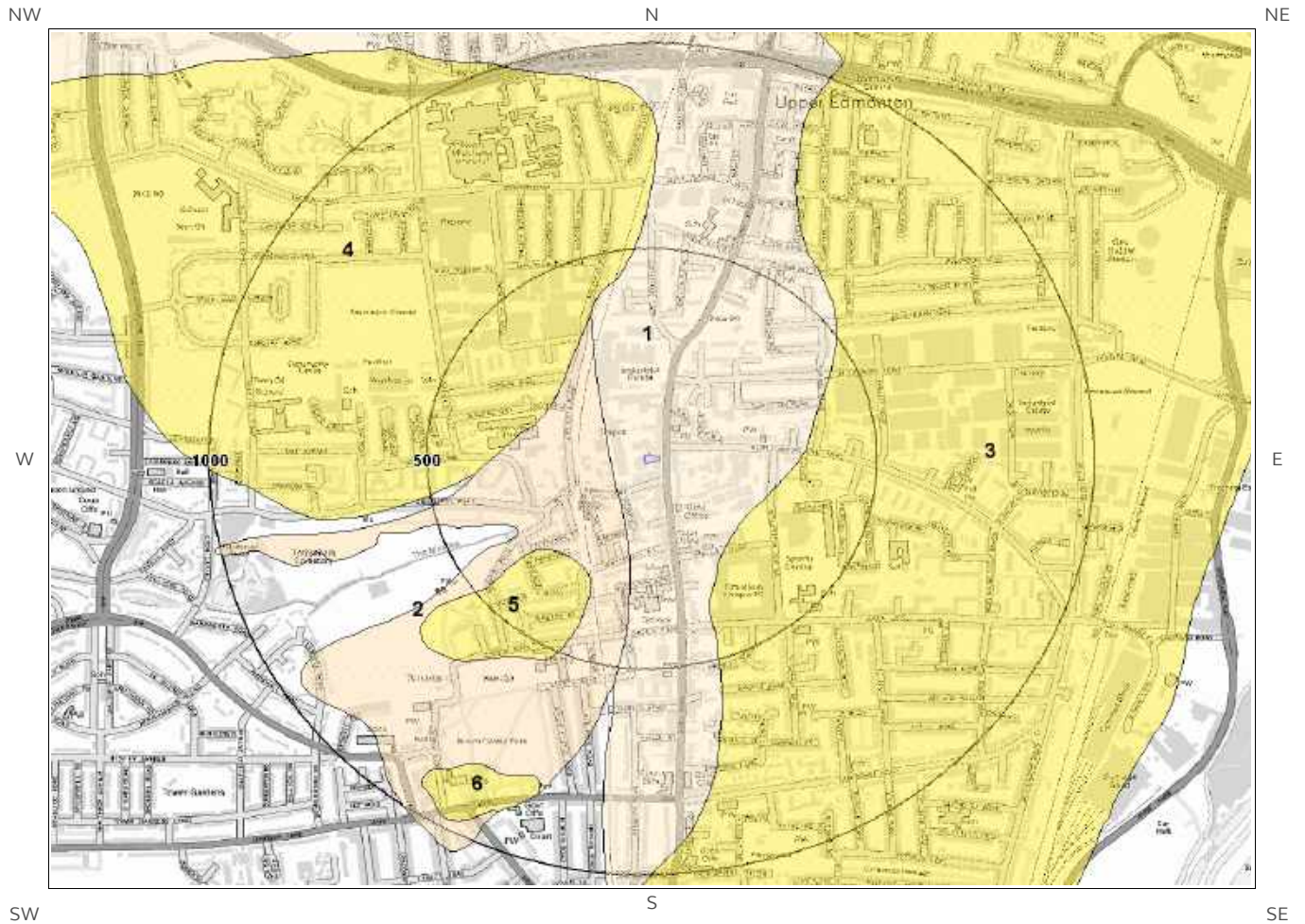
ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	336.0	N	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID
2	343.0	SW	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID

2.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? No

Database searched and no data found.

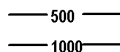
2.2 Superficial Deposits and Landslips map (1:50,000 scale)



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Site Outline



Search Buffers (m)

2.2 Superficial Deposits and Landslips

2.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

ID	Distance	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	KPGR-XSV	KEMPTON PARK GRAVEL MEMBER	SAND AND GRAVEL
2	78.0	W	TPGR-XSV	TAPLOW GRAVEL MEMBER	SAND AND GRAVEL
3	238.0	SE	ESI-XCZ	ENFIELD SILT MEMBER	CLAY AND SILT
4	246.0	NW	ESI-XCZ	ENFIELD SILT MEMBER	CLAY AND SILT
5	286.0	SW	ESI-XCZ	ENFIELD SILT MEMBER	CLAY AND SILT

2.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Intergranular	Very High	High

2.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

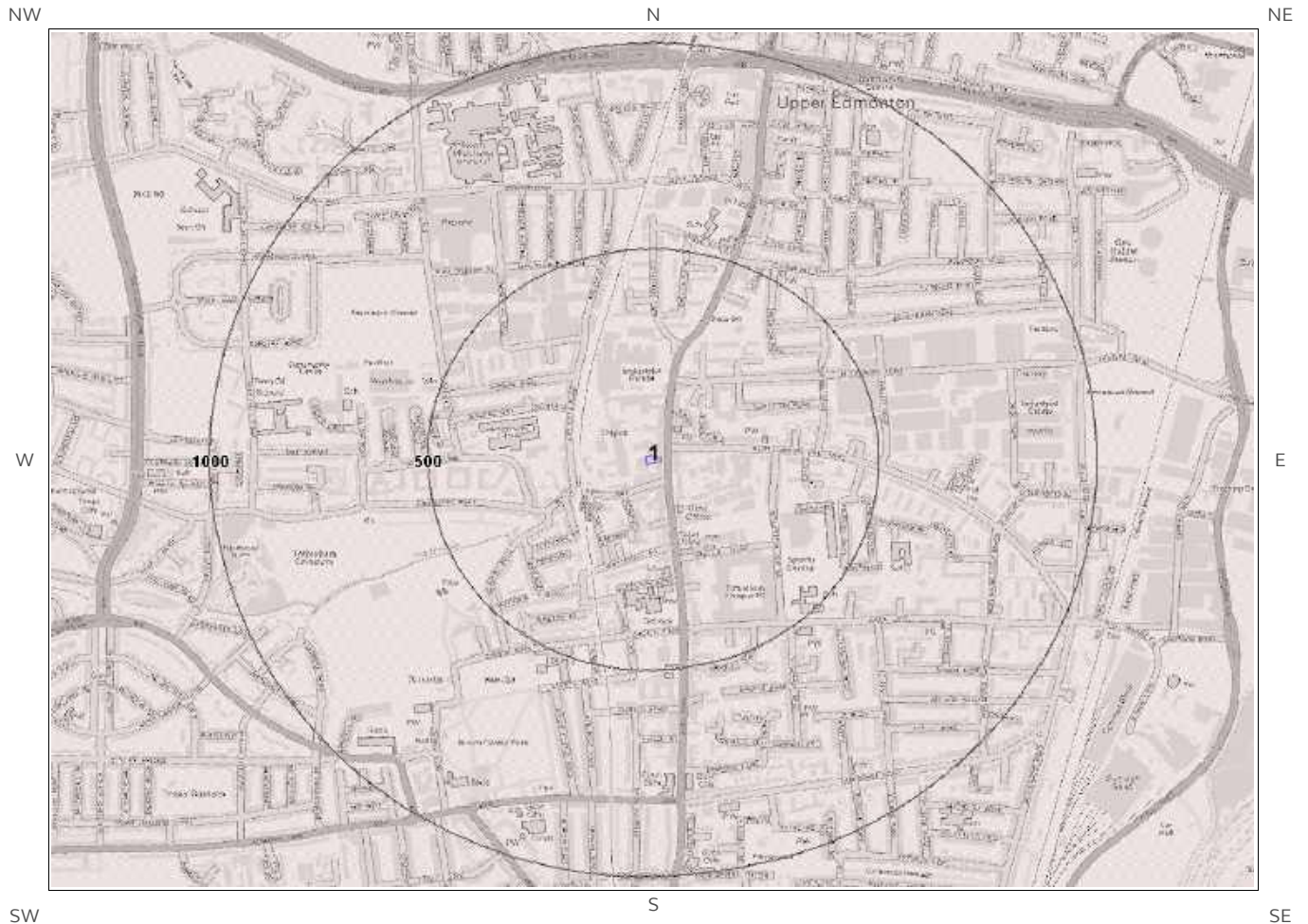
This Geology shows the main components as discrete layers, there are: Artificial/ Made Ground, Superficial/ Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site boundary? No

Database searched and no data found.

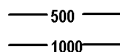
2.3 Bedrock and linear features map (1:50,000 scale)



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Site Outline



Search Buffers (m)

2.3 Bedrock, Solid Geology & linear features

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 256

2.3.1 Bedrock/Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary:

ID	Distance	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	LC-XCZS	LONDON CLAY FORMATION - CLAY, SILT AND SAND	YPRESIAN

2.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site boundary? Yes

Distance	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Mixed	Moderate	Very Low

2.3.3 Linear features

Are there any records of linear features within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nation wide coverage.

3 Radon Data

3.1 Radon Affected Areas

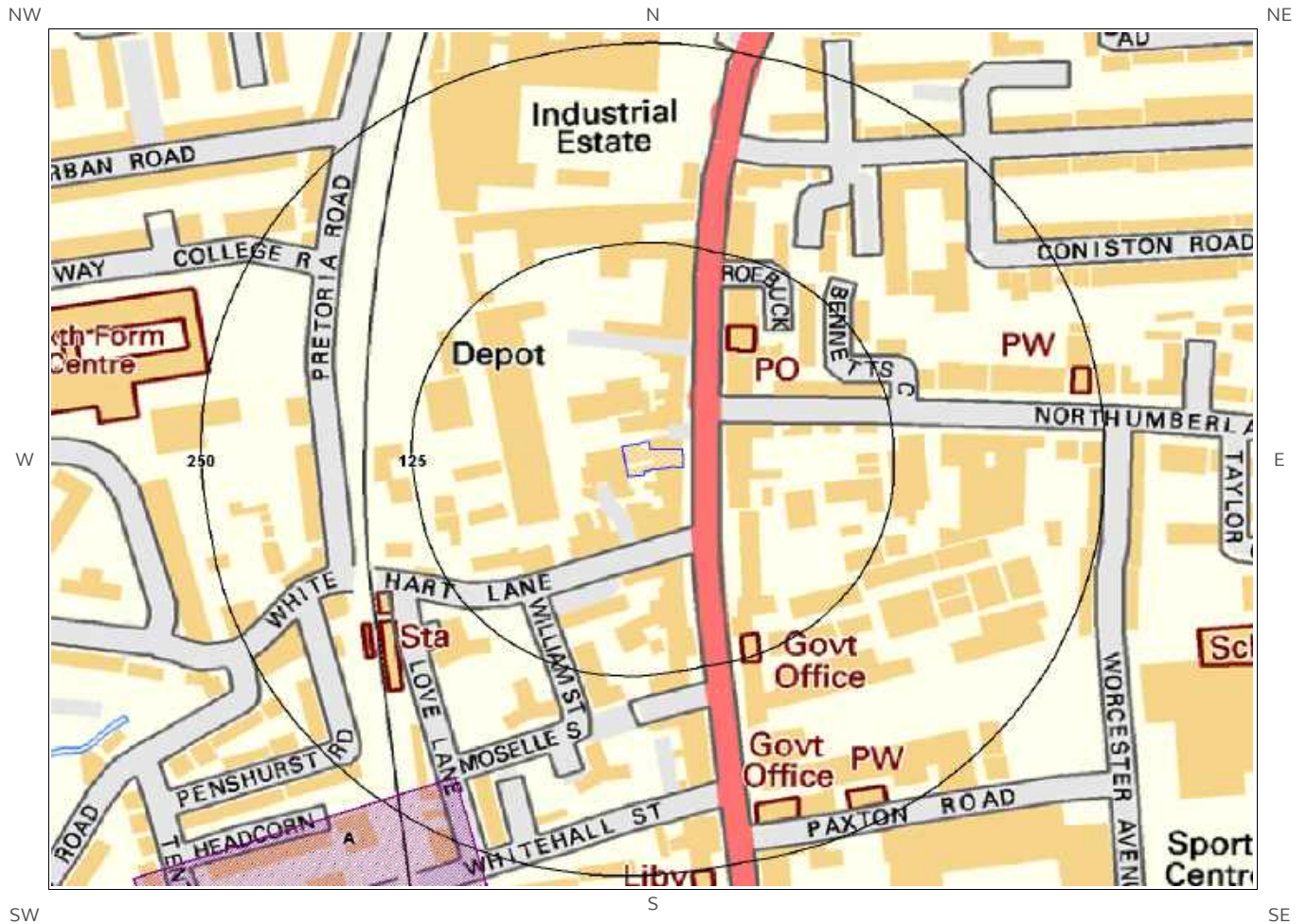
Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

3.2 Radon Protection

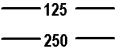
Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

4 Ground Workings map



Ground Workings Legend

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-  Site Outline
-  Historic Surface Ground Workings
-  Historic Underground Workings
-  Current Ground Workings
-  Search Buffers (m)
125
250

4 Ground Workings

4.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on Groundsure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Use	Date
1A	214.0	SW	533654 191169	Brick Field	1879
2A	214.0	SW	533654 191169	Brick Field	1869

4.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the Groundsure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? No

Database searched and no data found.

4.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

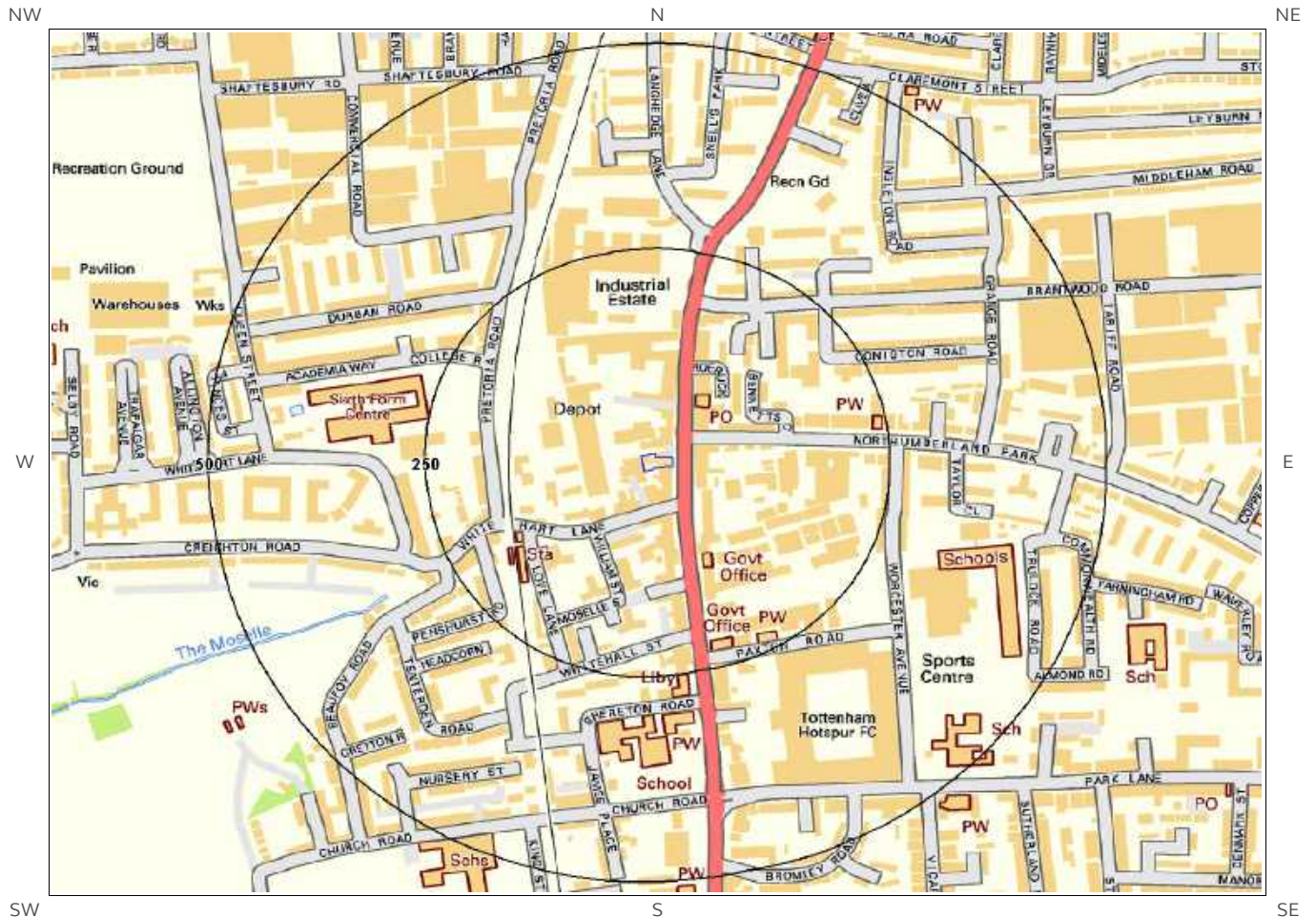
Are there any BGS Current Ground Workings within 1000m of the study site boundary? Yes

The following Current Ground Workings information is provided by British Geological Survey:

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	643.0	NW	533492 192010	Sand & Gravel	Bridport Road Gravel Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	746.0	N	533593 192170	Clay & Shale	Tanners End Brick Field	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	785.0	NW	533255 191999	Clay & Shale	Bridport Road Brick Field	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

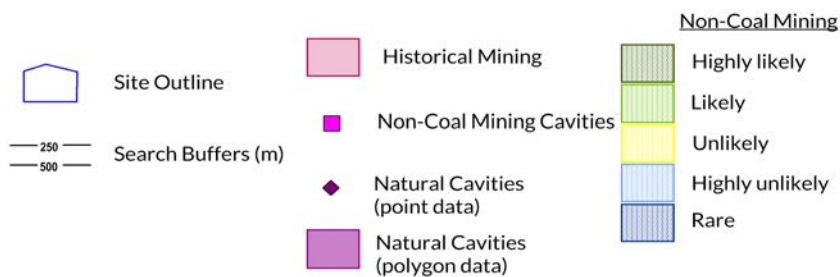
ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	945.0	NW	533185 192155	Clay & Shale	Bull Lane Brick Field	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

5 Mining, Extraction & Natural Cavities map



Mining, Extraction and Natural Cavities Legend

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5 Mining, Extraction & Natural Cavities

5.1 Historical Mining

This dataset is derived from Groundsure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? No

The following information provided by JPB is not represented on mapping: Database searched and no data found.

5.4 Non-Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled “Review of mining instability in Great Britain, 1990” PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? No

Database searched and no data found.

5.6 Natural Cavities

This dataset provides information based on the Peter Brett Associates natural cavities database. The dataset is made up of points and polygons. Where polygons are used these represent an area in which it is expected the cavities could be found. It does not indicate that cavities are present everywhere within the polygon, and caution should be used in the interpretation of this data.

Are there any Natural Cavities within 1000m of the study site boundary? No

Database searched and no data found.

5.7 Brine Extraction

This data provides information from the Cheshire Brine Subsidence Compensation Board.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.9 Cornwall and Devon Metalliferous Mining

This dataset provides information on metalliferous mining areas in Cornwall/Devon and is derived from records held by Mining Searches UK.

Are there any Cornwall and Devon Metalliferous Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.10 Clay Mining

This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

Are there any Clay Mining areas within 1000m of the study site boundary?

No

Database searched and no data found.

6 Natural Ground Subsidence

6.1 Shrink-Swell Clay map

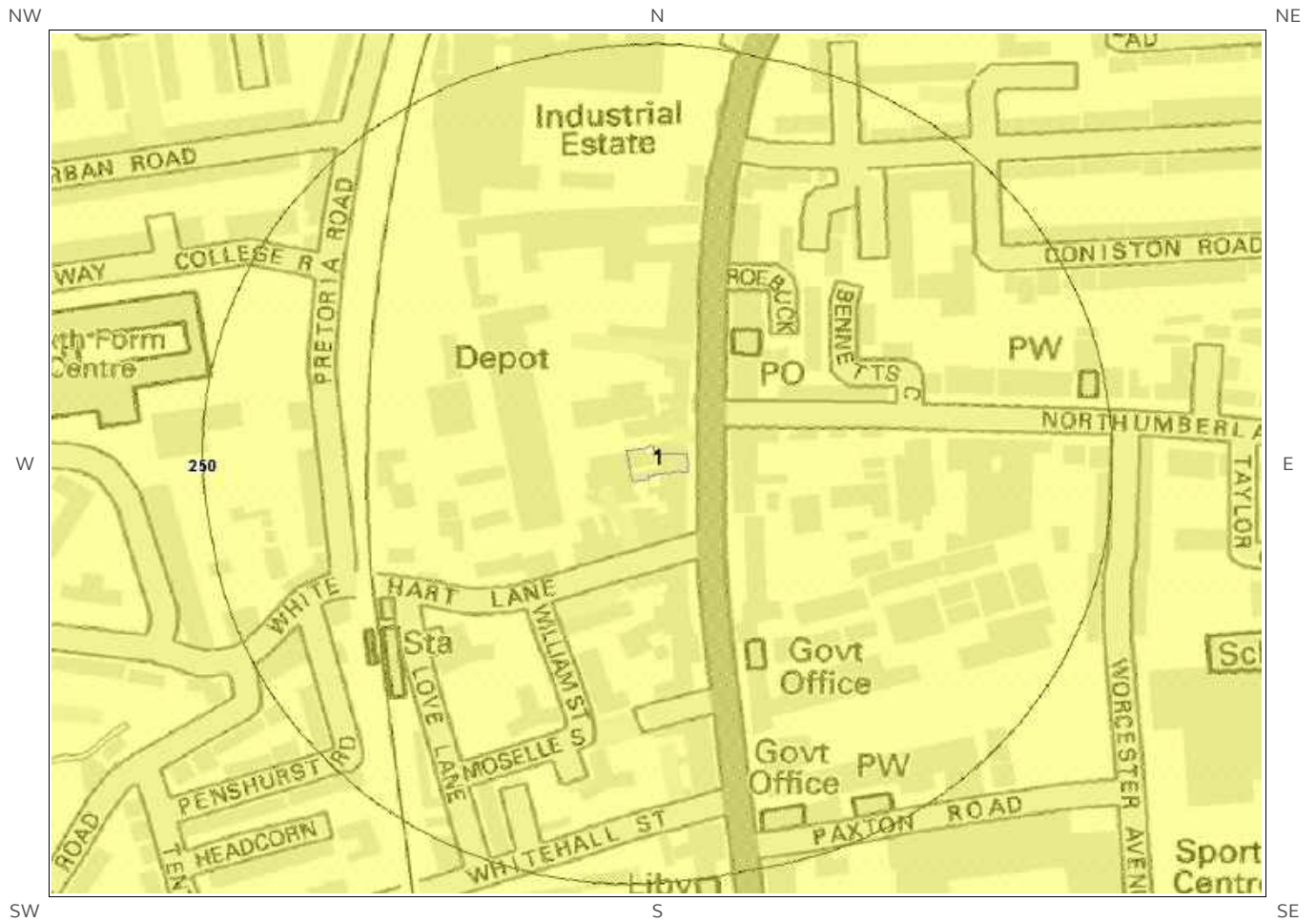


Shrink Swell Clay Legend

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6.2 Landslides map

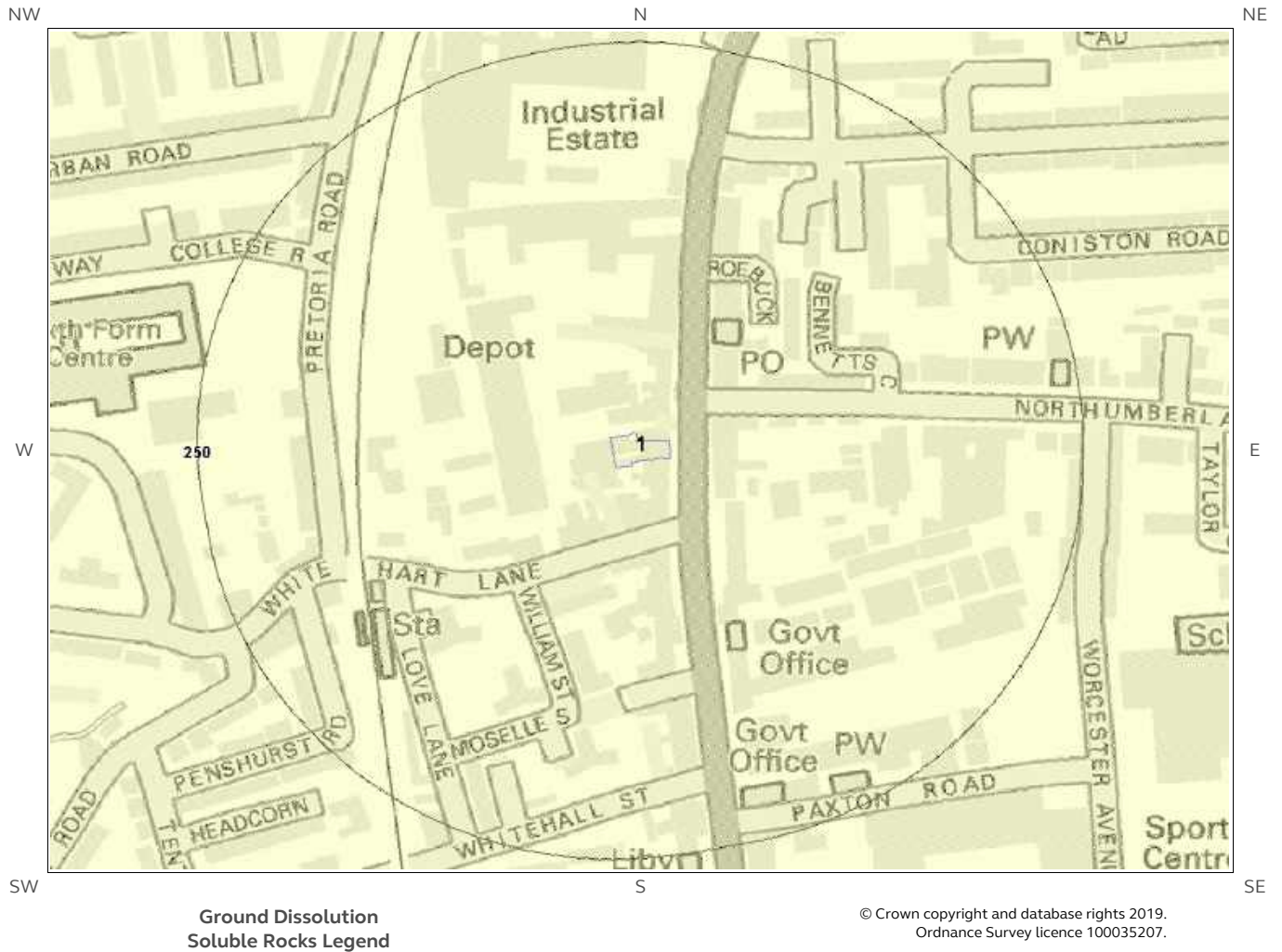


Landslides Legend

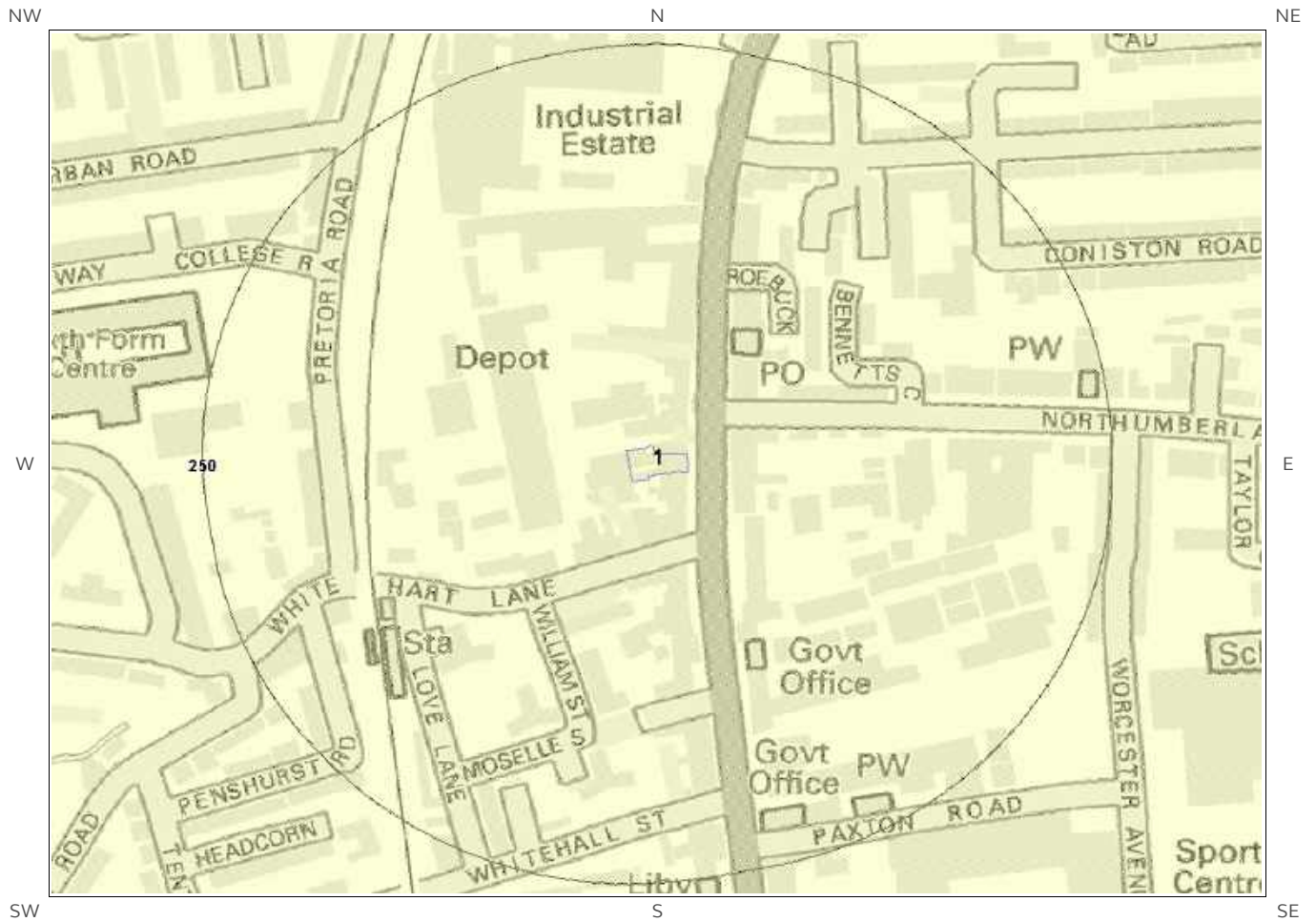
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6.3 Ground Dissolution of Soluble Rocks map



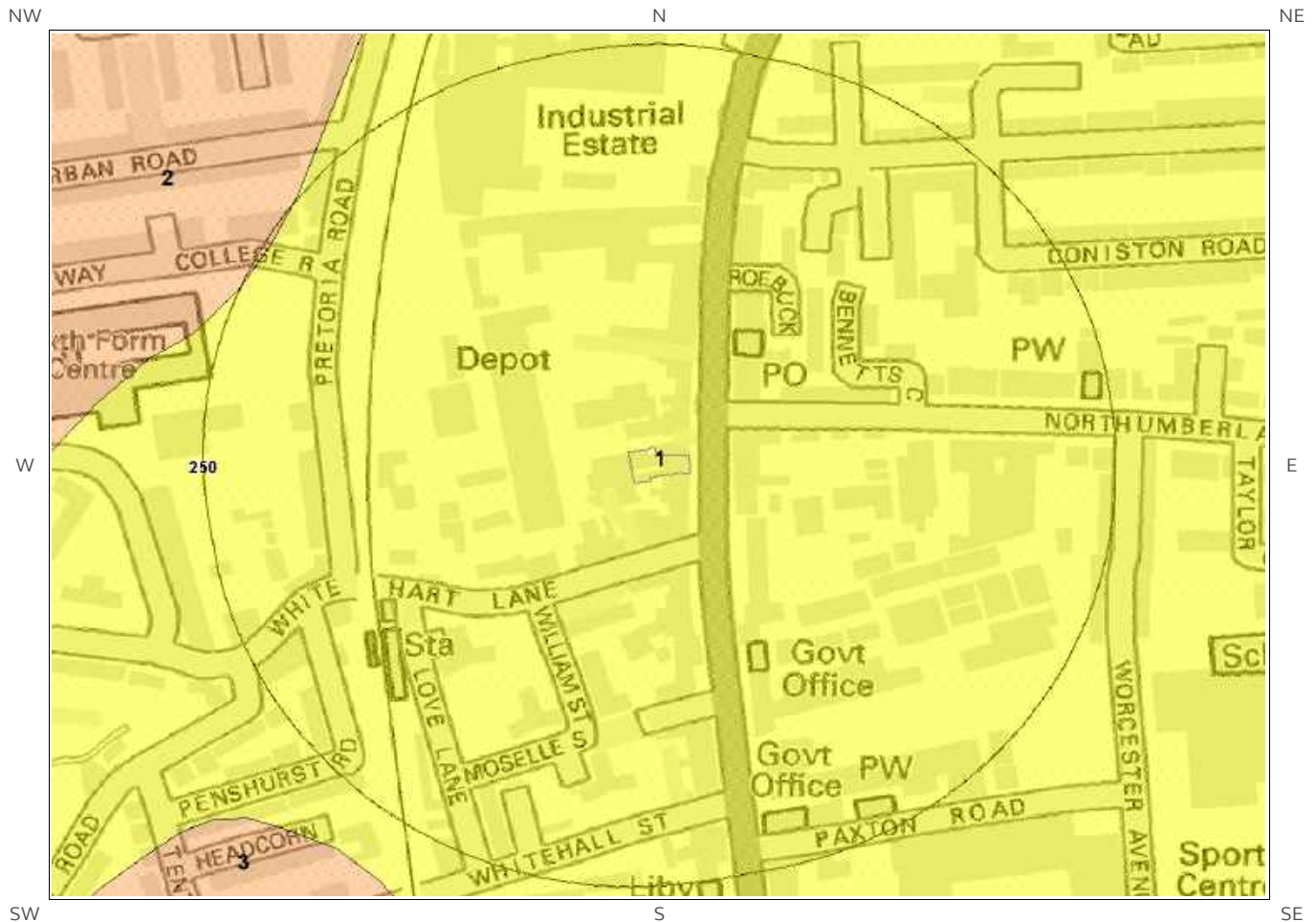
6.4 Compressible Deposits map



Compressible Deposits Legend

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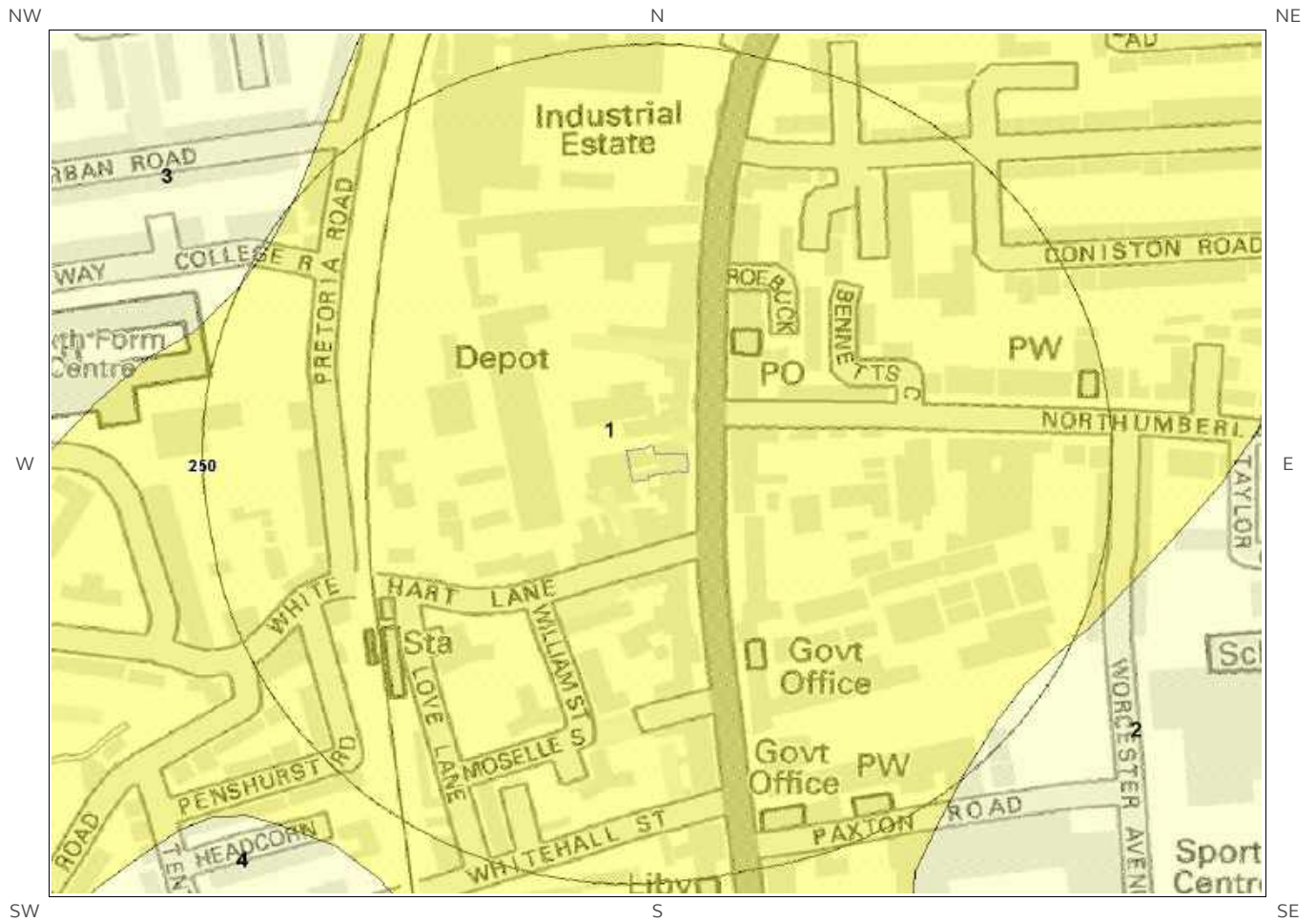




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6.6 Running Sand map



Running Sand Legend

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6 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site* boundary? **Moderate**

6.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Moderate	Ground conditions predominantly high plasticity. Do not plant or remove trees or shrubs near to buildings without expert advice about their effect and management. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a probable increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a probable increase in insurance risk during droughts or where vegetation with high moisture demands is present.
2	24.0	W	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.

6.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

* This includes an automatically generated 50m buffer zone around the site

6.3 Ground Dissolution of Soluble Rocks

The following Ground Dissolution information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

6.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

6.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

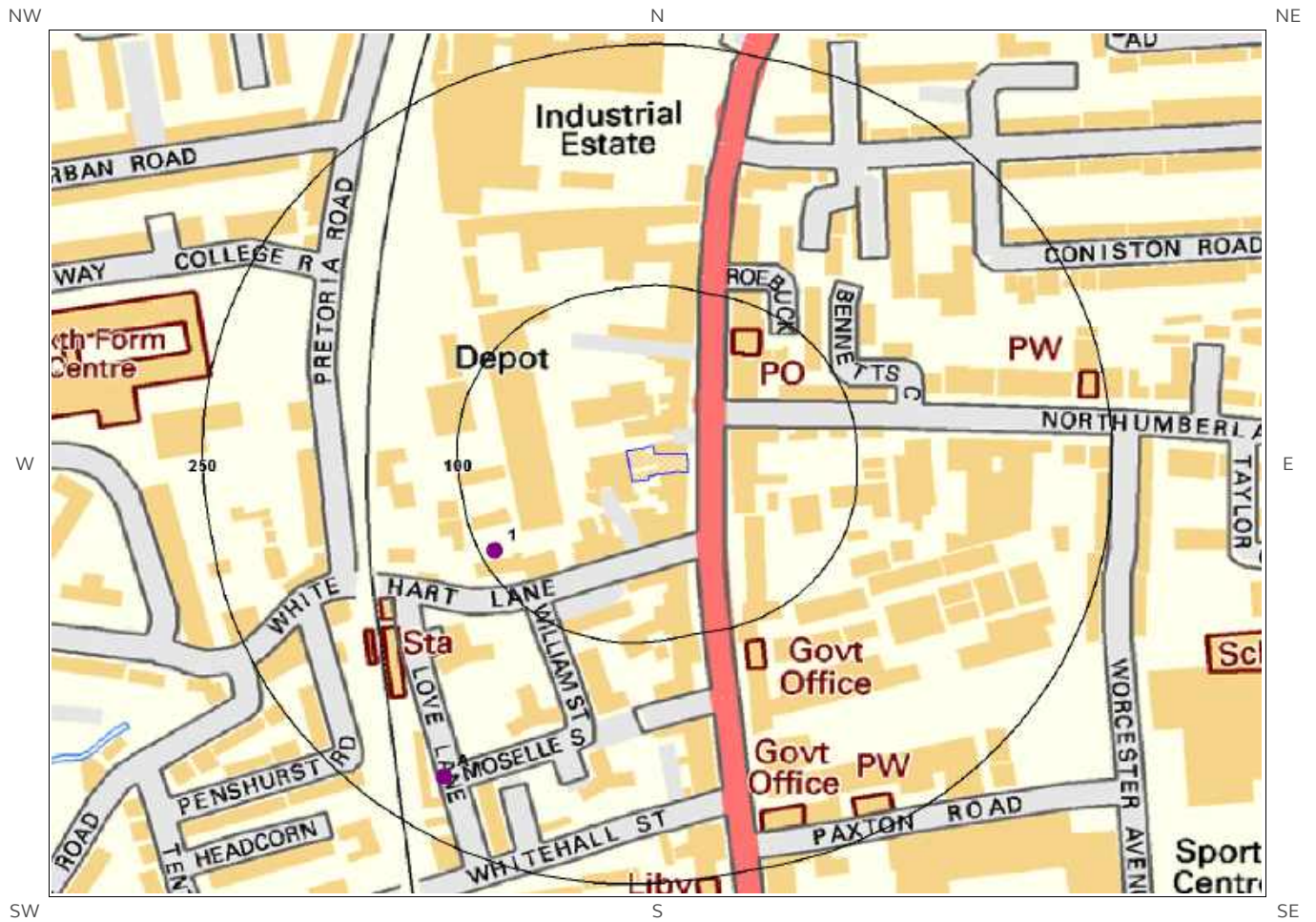
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

6.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

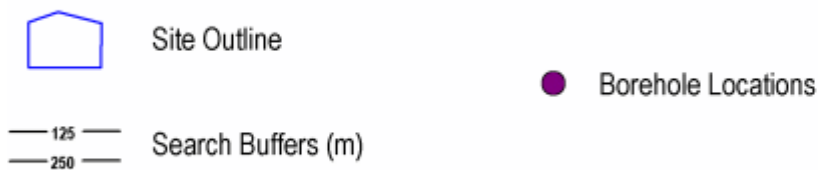
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

7 Borehole Records map



Borehole Records Legend

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7 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary:

3

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	92.0	SW	533750 191400	TQ39SW206	91.44	WHITE HART LANE TOTTENHAM
2A	214.0	SW	533720 191260	TQ39SW5/B	9.3	ORCHARD PLACE TOTTENHAM
3A	214.0	SW	533720 191260	TQ39SW5/A	9.14	ORCHARD PLACE TOTTENHAM

The borehole records are available using the hyperlinks below: Please note that if the donor of the borehole record has requested the information be held as commercial-in-confidence, the additional data will be held separately by the BGS and a formal request must be made for its release.

#1: scans.bgs.ac.uk/sobi_scans/boreholes/804149

#2A: scans.bgs.ac.uk/sobi_scans/boreholes/803914

#3A: scans.bgs.ac.uk/sobi_scans/boreholes/803913

8 Estimated Background Soil Chemistry

Records of background estimated soil chemistry within 250m of the study site boundary:

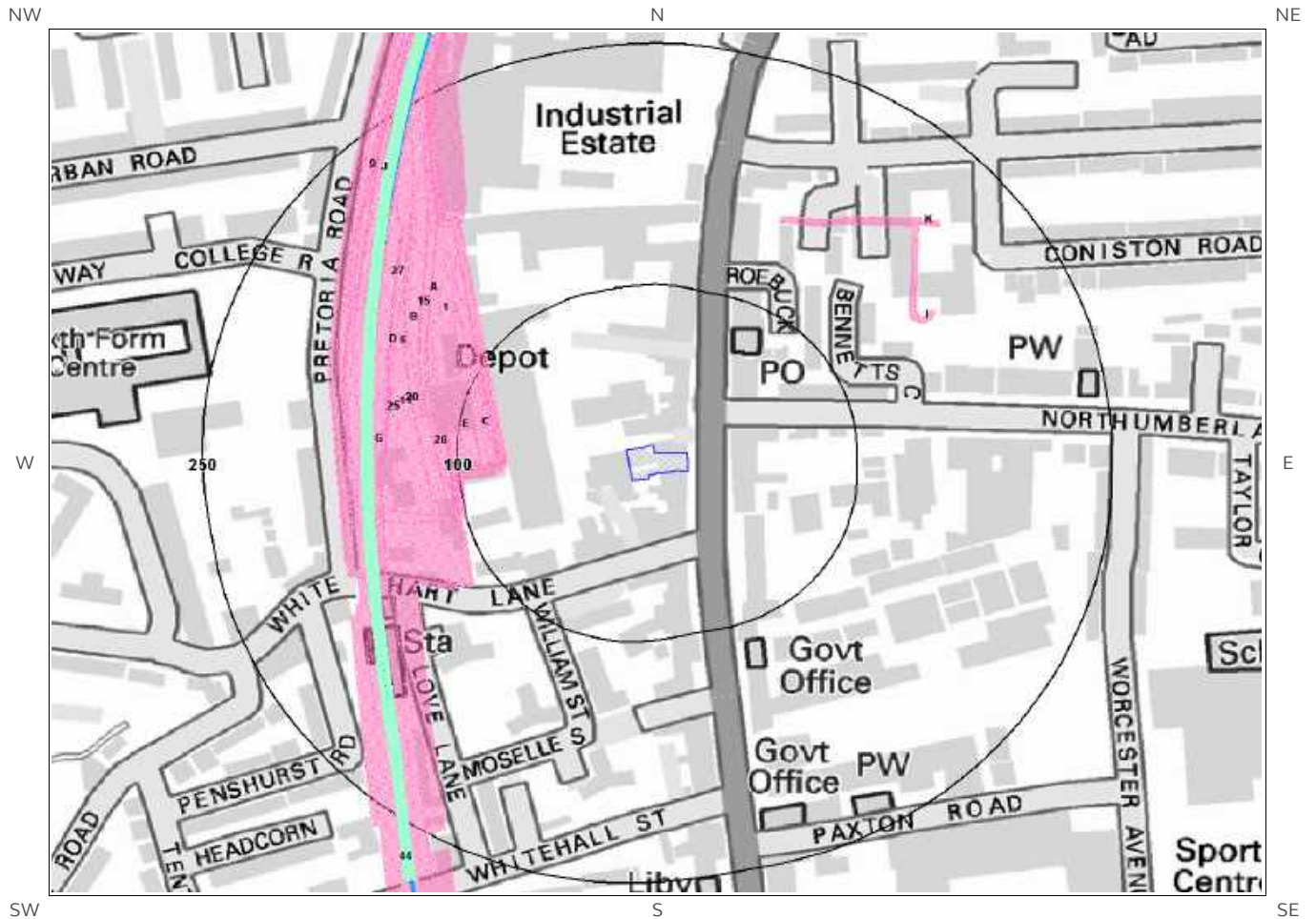
2

For further information on how this data is calculated and limitations upon its use, please see the Groundsure Geo Insight User Guide, available on request.

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	London	No data	No data	No data	No data	No data
35.0	N	London	No data	No data	No data	No data	No data

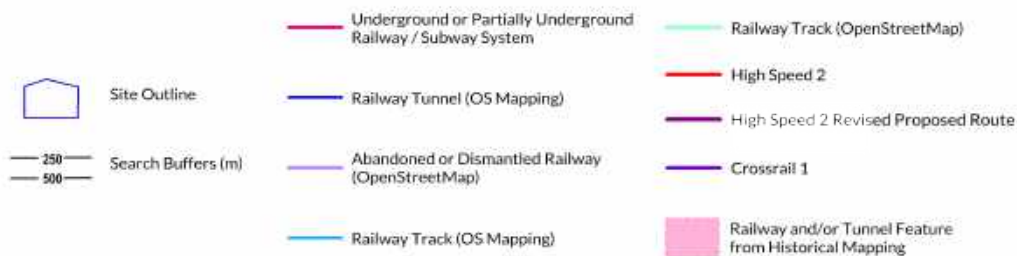
*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

9 Railways and Tunnels map



Railways and Tunnels Legend

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9 Railways and Tunnels

9.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No

Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No

Have any other railway tunnels been identified within 250m of the site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

9.2 Historical Railway and Tunnel Features

This data is derived from Groundsure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? No

Have any historical railway or tunnel features been identified within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Details	Date
1	71	W	533727 191571	Railway Sidings	1982
10	71	W	n/a	Railway	1935
2B	72	W	533709 191616	Railway Sidings	1938
3A	73	W	533721 191578	Railway Sidings	1966
4A	73	W	533721 191578	Railway Sidings	1974
5B	74	W	533694 191669	Railway Sidings	1920

ID	Distance (m)	Direction	NGR	Details	Date
6	75	W	533691 191665	Railway Sidings	1951
11	75	W	n/a	Railway	1914
12C	76	W	533745 191478	Railway Sidings	1972
13C	77	W	533745 191478	Railway Sidings	1964
14C	77	W	533745 191478	Railway Sidings	1955
15	77	W	533707 191672	Railway Sidings	1955
16D	79	W	519372 186381	Railway Sidings	1913
17E	86	W	533733 191476	Railway Sidings	1964
18E	86	W	533733 191476	Railway Sidings	1955
19E	86	W	533737 191477	Railway Sidings	1972
20	87	W	n/a	Railway	1894
21F	93	NW	533707 191673	Railway Sidings	1970
22F	93	NW	533707 191673	Railway Sidings	1975
23F	93	NW	533707 191673	Railway Sidings	1964
24	93	NW	533707 191673	Railway Sidings	1955
25	98	W	n/a	Railway	1896
26	102	W	533718 191463	Railway Sidings	1955
7D	103	W	533698 191591	Railway Sidings	1894
27	106	W	533690 191605	Railway Sidings	1896
8	110	W	533698 191528	Railway Sidings	1896
28G	141	W	533682 191462	Railway Sidings	1972
29G	142	W	533683 191460	Railway Sidings	1964
30G	142	W	533683 191460	Railway Sidings	1955
31H	153	N	533997 191574	Railway Sidings	1970
32H	153	N	533997 191574	Railway Sidings	1964
33H	153	N	533997 191574	Railway Sidings	1955
34H	154	N	533997 191574	Railway Sidings	1955
35I	158	NE	534005 191545	Railway Sidings	1965
36I	158	NE	534005 191545	Railway Sidings	1955
37I	158	NE	534005 191545	Railway Sidings	1968

ID	Distance (m)	Direction	NGR	Details	Date
38J	178	NW	533684 191641	Railway Sidings	1955
39J	178	NW	533685 191643	Railway Sidings	1955
9	185	NW	533687 191685	Railway Sidings	1896
40K	196	NE	534006 191604	Railway Sidings	1955
41K	196	NE	534006 191604	Railway Sidings	1968
42K	196	NE	534006 191603	Railway Sidings	1965
43K	197	NE	534006 191603	Railway Sidings	1955
44	247	SW	n/a	Railway	1913

Any records that have been identified are represented on the Railways and Tunnels map.

9.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? No

Have any historical railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Multiple sections of the same track may be listed in the detail above

Any records that have been identified are represented on the Railways and Tunnels map.

9.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary? No

Have any active railway lines been identified within 250m of the study site boundary? Yes

Distance (m)	Direction	Name	Type
151	W	Lea Valley Lines	rail
151	W	Lea Valley Lines	rail
152	W	Not given	Multi Track
152	W	Not given	Multi Track
155	W	Lea Valley Lines	rail
155	W	Lea Valley Lines	rail
162	W	Lea Valley Lines	rail
162	W	Lea Valley Lines	rail
165	W	Lea Valley Lines	rail
165	W	Lea Valley Lines	rail
166	SW	Lea Valley Lines	rail

Distance (m)	Direction	Name	Type
166	SW	Lea Valley Lines	rail
169	SW	Lea Valley Lines	rail
169	SW	Lea Valley Lines	rail

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels map.

9.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail 1 .

Is the study site within 5km of the route of the High Speed 2 rail project? No

Is the study site within 500m of the route of the Crossrail 1 rail project? No

Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a Groundsure HS2 and Crossrail 1 Report.

The route data has been digitised from publicly available maps by Groundsure. The route as provided relates to the Crossrail 1 project only, and does not include any details of the Crossrail 2 project, as final details of the route for Crossrail 2 are still under consultation.

Please note that this assessment takes account of both the original Phase 2b proposed route and the amended route proposed in 2016. As the Phase 2b route is still under consultation, Groundsure are providing information on both options until the final route is formally confirmed. Practitioners should take account of this uncertainty when advising clients.

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Fax: 0115 936 3276.
Email: enquiries@bgs.ac.uk
Web: www.bgs.ac.uk



BGS Geological Hazards Reports and general geological enquiries

British Gypsum

British Gypsum Ltd
East Leake
Loughborough
Leicestershire
LE12 6HX



The Coal Authority

200 Lichfield Lane
Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk



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Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
<https://www.gov.uk/government/organisations/public-health-england>
Email: enquiries@phe.gov.uk
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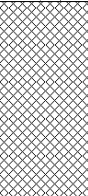
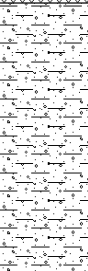
APPENDIX D: Trial Hole Logs





Percussion Drilling Log

Project Name: 807 High Road, Tottenham		Client: F3 Architectcs LLP		Date: 09/08/2022	
Location: London N17 8ER		Contractor:			
Project No. : GWPR4898		Crew Name:		Drilling Equipment:	
Borehole Number WS2	Hole Type WS	Level	Logged By	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	D		0.20			CONCRETE	1
		0.50	D				MADE GROUND: Dark brown gravelly clayey fine to coarse SAND. Gravel was subangular to subrounded fine to medium fragments of brick (40%) and flint (60%).		
		0.80	D						
		1.00	D						
		1.50	D						
		2.00	D				Orangish brown sandy very gravelly CLAY. Sand was fine to medium. Gravel was subangular to subrounded fine to medium flint (KEMPTON PARK GRAVEL MEMBER).	2	
		2.50	D						
		3.00	D					3	
3.50	D	4							
				3.30			Orangish brown gravelly clayey fine to coarse SAND. Gravel was subangular to subrounded fine to coarse flint (KEMPTON PARK GRAVEL MEMBER).	4	
				3.60					
End of Borehole at 3.600m									4
									5
									6
									7
									8
									9
									10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Roots were noted to 0.60m bgl. No groundwater was encountered.







Percussion Drilling Log

Project Name: 807 High Road, Tottenham		Client: F3 Architectcs LLP		Date: 09/08/2022	
Location: London N17 8ER		Contractor:			
Project No. : GWPR4898		Crew Name:		Drilling Equipment:	
Borehole Number WS4	Hole Type WS	Level	Logged By	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	D		0.22			CONCRETE	
		0.50	D					MADE GROUND: Dark brown gravelly clayey fine to coarse SAND. Gravel was subangular to subrounded fine to coarse fragments of flint (50%), brick (30%) and concrete (20%).	1
		0.80	D						
		1.00	D		1.10				
		1.50	D					Orangish brown clayey very gravelly fine to coarse SAND. Gravel was subangular to subrounded fine to coarse flint (KEMPTON PARK GRAVEL MEMBER).	2
		2.00	D						
		2.50	D						
		3.00	D		3.00			Orangish brown clayey sandy subangular to subrounded fine to coarse GRAVEL of flint. Sand was fine to coarse (KEMPTON PARK GRAVEL MEMBER).	3
		3.50	D						
					4.00			End of Borehole at 4.000m	4
									5
									6
									7
									8
									9
									10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks
No roots or groundwater was encountered.





Percussion Drilling Log

Project Name: 807 High Road, Tottenham		Client: F3 Architetcs LLP		Date: 09/08/2022	
Location: London N17 8ER		Contractor:			
Project No. : GWPR4898		Crew Name:		Drilling Equipment:	
Borehole Number WS5	Hole Type WS	Level	Logged By	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	D		0.10			CONCRETE	
		0.50	D					MADE GROUND: Dark brown gravelly clayey fine to coarse SAND. Gravel was subangular to subrounded fine to coarse fragments of brick (40%), concrete (10%) and flint (10%).	1
		0.80	D						
		1.00	D						
		1.50	D						
		2.00	D						2
		2.50	D		2.20			Orangish brown sandy gravelly CLAY. Sand was fine to coarse. Gravel was subangular to subrounded fine to coarse flint (KEMPTON PARK GRAVEL MEMBER).	
		3.00	D		2.70				
					3.10			Orangish brown clayey very gravelly fine to coarse SAND. Gravel was subangular to rounded fine to coarse flint (KEMPTON PARK GRAVEL MEMBER).	3
								End of Borehole at 3.100m	
									4
									5
									6
									7
									8
									9
									10

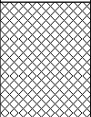
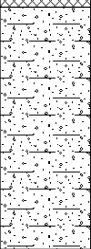
Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks
No roots or groundwater was encountered.



Trial Pit Log

Project Name: 807 High Road, Tottenham		Client: F3 Architectcs LLP		Date: 16/08/2022	
Location: London N17 8ER		Contractor:			
Project No. : GWPR4898		Crew Name:		Equipment:	
Location Number TP/FE1	Location Type TP	Level	Logged By	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	D		0.40			MADE GROUND: Brown gravelly fine to coarse SAND. Gravel was subangular to subrounded flint (70%), brick (20%) and concrete (10%).	1
		0.50	D					Orangish brown gravelly clayey fine to coarse SAND. Gravel was subangular to subrounded fine to medium flint (KEMPTON PARK GRAVEL MEMBER).	
		0.80	D						
		1.00	D		1.20	End of Borehole at 1.200m			
									3
									4
									5

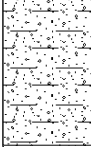
Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks No groundwater was encountered. No roots were encountered.							
--	--	--	--	--	--	--	---



Trial Pit Log

Project Name: 807 High Road, Tottenham		Client: F3 Architetcs LLP		Date: 16/08/2022	
Location: London N17 8ER		Contractor:			
Project No. : GWPR4898		Crew Name:		Equipment:	
Location Number TP/FE2	Location Type TP	Level	Logged By	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	D		0.20			CONCRETE	1
		0.50	D		0.50			MADE GROUND: Dark brown gravelly fine to coarse SAND. Gravel was subangular to subrounded fine to medium flint (70%), brick (15%) and concrete (15%).	
		0.80	D					Orangish brown gravelly clayey fine to coarse SAND. Gravel was subangular to subrounded fine to medium flint (KEMPTON PARK GRAVEL MEMBER).	
		1.00	D						
					1.20			End of Borehole at 1.200m	2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks

No groundwater was encountered. No roots were encountered.





Trial Pit Log

Project Name: 807 High Road, Tottenham		Client: F3 Architetcs LLP		Date: 16/08/2022	
Location: London N17 8ER		Contractor:			
Project No. : GWPR4898		Crew Name:		Equipment:	
Location Number TP/FE3	Location Type TP	Level	Logged By	Scale 1:25	Page Number Sheet 1 of 1

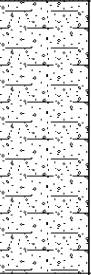
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	D		0.20			CONCRETE	
		0.50	D		0.50			MADE GROUND: Dark brown gravelly clayey fine to coarse SAND. Gravel was subangular to subrounded fine to medium flint (80%) and brick (20%).	
		0.80	D					Orangish brown gravelly clayey fine to coarse SAND. Gravel was subangular to subrounded fine to medium flint (KEMPTON PARK GRAVEL MEMBER).	
		1.00	D						1
					1.20			End of Borehole at 1.200m	
									2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks	
No groundwater was encountered. No roots were encountered.	

Trial Pit Log

Project Name: 807 High Road, Tottenham		Client: F3 Architectcs LLP		Date: 16/08/2022	
Location: London N17 8ER		Contractor:			
Project No. : GWPR4898		Crew Name:		Equipment:	
Location Number TP/FE5	Location Type TP	Level	Logged By	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	D		0.30			MADE GROUND: Brown gravelly fine to medium SAND. Gravel was subangular to subrounded concrete (50%), flint (10%) and brick (40%).	1
		0.50	D					Orangish brown gravelly clayey fine to coarse SAND. Gravel was subangular to subrounded fine to medium flint (KEMPTON PARK GRAVEL MEMBER).	
		0.80	D						
		1.00	D		1.20				
								End of Borehole at 1.200m	5

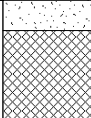
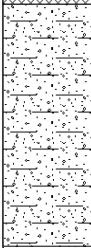
Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks No groundwater was encountered. No roots were encountered.							
--	--	--	--	--	--	--	---



Trial Pit Log

Project Name: 807 High Road, Tottenham		Client: F3 Architets LLP		Date: 16/08/2022	
Location: London N17 8ER		Contractor:			
Project No. : GWPR4898		Crew Name:		Equipment:	
Location Number TP/FE6	Location Type TP	Level	Logged By	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	D		0.10			Flooring	1
								MADE GROUND: Brown gravelly fine to coarse SAND. Gravel was subangular to subrounded fine to medium flint (70%) and brick (30%).	
		0.50	D		0.40			Orangish brown gravelly clayey fine to coarse SAND. Gravel was subangular to subrounded fine to medium flint (KEMPTON PARK GRAVEL MEMBER).	
		0.80	D						
		1.00	D						
					1.20			End of Borehole at 1.200m	2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks No groundwater was encountered. No roots were encountered.							
---	--	--	--	--	--	--	---







Project Name: 807 High Road, Tottenham				Client: F3 Architectcs LLP				Date: 16/08/2022				
Location: London N17 8ER				Contractor:								
Project No. : GWPR4898				Crew Name:				Equipment:				
Location Number TP/FE9		Location Type TP		Level		Logged By		Scale 1:25		Page Number Sheet 1 of 1		
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description				
		Depth (m)	Type	Results								
		0.20	D		0.20			CONCRETE FLOORING		1		
		0.50	D		0.50			MADE GROUND: Dark brown gravelly clayey fine to coarse SAND. Gravel was subangular to subrounded fine to medium brick (40%), concrete (10%) and flint (50%).				
		0.80	D					Orangish brown gravelly clayey fine to coarse SAND. Gravel was subangular to subrounded fine to medium flint (KEMPTON PARK GRAVEL MEMBER).				
		1.00	D									
						1.20		End of Borehole at 1.200m				
										2		
										3		
										4		
										5		
Dimensions				Trench Support and Comment				Pumping Data				
Pit Length		Pit Width		Pit Stability		Shoring Used		Remarks		Date	Rate	Remarks
Remarks												
No groundwater was encountered. No roots were encountered.												
												

APPENDIX E:

Chemical Laboratory Testing



Ground and Water Ltd
Head Office
2 The Long Barn
Norton Farm, Selborne Road
Alton
Hampshire
GU34 3NB

Attention: Anna Smaje

CERTIFICATE OF ANALYSIS

Date of report Generation:	25 August 2022
Customer:	Ground and Water Ltd
Sample Delivery Group (SDG):	220818-64
Your Reference:	GWPR4898
Location:	High Road
Report No:	658969
Order Number:	GWPR4898

We received 3 samples on Thursday August 18, 2022 and 3 of these samples were scheduled for analysis which was completed on Thursday August 25, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 220818-64
Client Ref.: GWPR4898

Report Number: 658969
Location: High Road

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26750379	WS2		0.50	09/08/2022
26750387	WS3		1.00	09/08/2022
26750383	WS5		1.50	09/08/2022

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 220818-64
Client Ref.: GWPR4898

Report Number: 658969
Location: High Road

Superseded Report:

Results Legend



Test



No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Results Legend	Lab Sample No(s)		26750379	26750387	26750383
	Customer Sample Reference		WS2	WS3	WS6
	AGS Reference				
	Depth (m)		0.50	1.00	1.50
	Container		60g VOC (ALE215) 1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260)
	Sample Type		S	S	S
			S	S	S
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1	X		
Anions by Kone (soil)	All	NDPs: 0 Tests: 3	X	X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X		
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 3	X	X	X
Boron Water Soluble	All	NDPs: 0 Tests: 3	X	X	X
CEN Readings	All	NDPs: 0 Tests: 1	X		
Coronene	All	NDPs: 0 Tests: 1	X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 3	X	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X		
EPH by GCxGC-FID	All	NDPs: 0 Tests: 1	X		
EPH CWG GC (S)	All	NDPs: 0 Tests: 2	X		X
Fluoride	All	NDPs: 0 Tests: 1	X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2		X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 3	X	X	X



CERTIFICATE OF ANALYSIS

Validated

SDG: 220818-64
Client Ref.: GWPR4898

Report Number: 658969
Location: High Road

Superseded Report:

Results Legend



Test


No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)

Customer
Sample Reference

AGS Reference

Depth (m)

Container

Sample Type

26750379

WS2

0.50

1kg TUB with
Handle (ALE260)

250g Amber Jar
(ALE210)

60g VOC (ALE215)

1kg TUB with
Handle (ALE260)

250g Amber Jar
(ALE210)

1kg TUB with
Handle (ALE260)

250g Amber Jar
(ALE210)

60g VOC (ALE215)

26750387

WS3

1.00

1kg TUB with
Handle (ALE260)

250g Amber Jar
(ALE210)

1kg TUB with
Handle (ALE260)

250g Amber Jar
(ALE210)

60g VOC (ALE215)

26750383

WS5

1.50

1kg TUB with
Handle (ALE260)

250g Amber Jar
(ALE210)

60g VOC (ALE215)

Loss on Ignition in soils

All

NDPs: 0
Tests: 1

X

Mercury Dissolved

All

NDPs: 0
Tests: 1

X

Metals in solid samples by OES

All

NDPs: 0
Tests: 3

X

X

X

PAH 16 & 17 Calc

All

NDPs: 0
Tests: 1

X

PAH by GCMS

All

NDPs: 0
Tests: 3

X

X

X

PCBs by GCMS

All

NDPs: 0
Tests: 1

X

pH

All

NDPs: 0
Tests: 3

X

X

X

pH Value of Filtered Water

All

NDPs: 0
Tests: 1

X

Phenols by HPLC (S)

All

NDPs: 0
Tests: 3

X

X

X

Phenols by HPLC (W)

All

NDPs: 0
Tests: 1

X

Sample description

All

NDPs: 0
Tests: 3

X

X

X

Total Organic Carbon

All

NDPs: 0
Tests: 3

X

X

X

TPH CWG GC (S)

All

NDPs: 0
Tests: 2

X

X

VOC MS (S)

All

NDPs: 0
Tests: 2

X

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 220818-64
Client Ref.: GWPR4898

Report Number: 658969
Location: High Road

Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
26750379	WS2	0.50	Light Brown	Sandy Loam	Stones	Brick
26750387	WS3	1.00	Dark Brown	Sandy Loam	Stones	Crushed Brick
26750383	WS5	1.50	Light Brown	Sandy Clay Loam	Stones	Brick

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

Validated

SDG: 220818-64
Client Ref.: GWPR4898

Report Number: 658969
Location: High Road

Superseded Report:

Results Legend		Customer Sample Ref.	WS2	WS3	WS5			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference						
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-4*§	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	10	6.5	18			
Loss on ignition	<0.7 %	TM018	5.26					
			M					
Phenol	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01			
			M	M	@ M			
Cresols	<0.01 mg/kg	TM062 (S)	<0.01	<0.01	<0.01			
			M	M	@ M			
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015	<0.015	<0.015			
			M	M	@ M			
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)	<0.035	<0.035	<0.035			
			M	M	@ M			
Organic Carbon, Total	<0.2 %	TM132	1.55	0.586	1.28			
			M	M	M			
Soil Organic Matter (SOM)	<0.35 %	TM132	2.67	1.01	2.21			
			#	#	#			
pH	1 pH Units	TM133	10.8	8.65	8.49			
			M	M	M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6	<0.6			
			M	M	M			
Cyanide, Total	<1 mg/kg	TM153	<1	<1	<1			
			@ M	@ M	@ M			
PCB congener 28	<0.003 mg/kg	TM168	<0.003					
			M					
PCB congener 52	<0.003 mg/kg	TM168	<0.003					
			M					
PCB congener 101	<0.003 mg/kg	TM168	<0.003					
			M					
PCB congener 118	<0.003 mg/kg	TM168	<0.003					
			M					
PCB congener 138	<0.003 mg/kg	TM168	<0.003					
			M					
PCB congener 153	<0.003 mg/kg	TM168	<0.003					
			M					
PCB congener 180	<0.003 mg/kg	TM168	<0.003					
			M					
Sum of detected PCB 7 Congeners	<0.021 mg/kg	TM168	<0.021					
Arsenic	<0.6 mg/kg	TM181	13.9	12.3	9.16			
			M	M	M			
Cadmium	<0.02 mg/kg	TM181	0.151	0.222	0.278			
			M	M	M			
Chromium	<0.9 mg/kg	TM181	7.68	14.1	9.66			
			M	M	M			
Copper	<1.4 mg/kg	TM181	38.5	118	66.7			
			M	M	M			
Lead	<0.7 mg/kg	TM181	175	97.7	189			
			M	M	M			
Mercury	<0.1 mg/kg	TM181	0.545	<0.1	0.642			
			M	M	M			
Nickel	<0.2 mg/kg	TM181	15.3	17.2	11.9			
			M	M	M			
Selenium	<1 mg/kg	TM181	<1	<1	<1			
			#	#	#			
Vanadium	<0.2 mg/kg	TM181	27.9	35.9	21			
			#	#	#			
Zinc	<1.9 mg/kg	TM181	56.1	87.6	124			
			M	M	M			
ANC @ pH 4	<0.03 mol/kg	TM182	0.109					
ANC @ pH 6	<0.03 mol/kg	TM182	0.0605					
Boron, water soluble	<1 mg/kg	TM222	<1	1.09	<1			
			M	M	M			
Water Soluble Sulphate as SO4 2:1 Extract	<0.004 g/l	TM243	0.155	0.164	0.0513			
			M	M	M			

SDG: 220818-64
Client Ref.: GWPR4898

Report Number: 658969
Location: High Road

Superseded Report:

TPH CWG (S)

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 220818-64
Client Ref.: GWPR4898

Report Number: 658969
Location: High Road

Superseded Report:

Asbestos Identification - Solid Samples

Results Legend

ISO17025 accredited.
M mCERIS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&*%@ Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	WS2 0.50 SOLID 09/08/2022 00:00:00 18/08/2022 05:00:00 220818-64 26750379 TM048	24/08/2022	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	WS3 1.00 SOLID 09/08/2022 00:00:00 18/08/2022 05:00:00 220818-64 26750387 TM048	24/08/2022	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	WS5 1.50 SOLID 09/08/2022 00:00:00 18/08/2022 05:00:00 220818-64 26750383 TM048	25/08/2022	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

Validated

SDG: 220818-64
Client Ref.: GWPR4898

Report Number: 658969
Location: High Road

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	High Road
Mass Sample taken (kg)	0.102	Natural Moisture Content (%)	13.3
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	88.3
Particle Size <4mm	>95%		

Case	
SDG	220818-64
Lab Sample Number(s)	26750379
Sampled Date	09-Aug-2022
Customer Sample Ref.	WS2
Depth (m)	0.50

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	1.55
Loss on Ignition (%)	5.26
Sum of BTEX (mg/kg)	<0.04
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg) (EH_2D_AL)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	10.8
ANC to pH 6 (mol/kg)	0.0605
ANC to pH 4 (mol/kg)	0.109

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.0137	<0.0005	0.137	<0.005	0.5	2	25
Barium	0.00152	<0.0002	0.0152	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.00117	<0.001	0.0117	<0.01	0.5	10	70
Copper	0.00358	<0.0003	0.0358	<0.003	2	50	100
Mercury Dissolved (CVAf)	0.0000123	<0.00001	0.000123	<0.0001	0.01	0.2	2
Molybdenum	0.00318	<0.003	0.0318	<0.03	0.5	10	30
Nickel	0.00054	<0.0004	0.0054	<0.004	0.4	10	40
Lead	0.00116	<0.0002	0.0116	<0.002	0.5	10	50
Antimony	0.00351	<0.001	0.0351	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	<0.001	<0.001	<0.01	<0.01	4	50	200
Chloride	10.1	<2	101	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	26.8	<2	268	<20	1000	20000	50000
Total Dissolved Solids	133	<5	1330	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.31	<3	43.1	<30	500	800	1000

Leach Test Information

Date Prepared	20-Aug-2022
pH (pH Units)	9.20
Conductivity (µS/cm)	162.00
Temperature (°C)	21.90
Volume Leachant (Litres)	0.888

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

25/08/2022 15:37:15

15:37:02 25/08/2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 220818-64
Client Ref.: GWPR4898

Report Number: 658969
Location: High Road

Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-characterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM).



CERTIFICATE OF ANALYSIS

Validated

SDG: 220818-64
Client Ref.: GWPR4898

Report Number: 658969
Location: High Road

Superseded Report:

Test Completion Dates

Lab Sample No(s)
Customer Sample Ref.

AGS Ref.
Depth
Type

26750379	26750387	26750383
WS2	WS3	WS5
0.50	1.00	1.50
Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
ANC at pH4 and ANC at pH 6	23-Aug-2022	
Anions by Kone (soil)	23-Aug-2022	23-Aug-2022
Anions by Kone (w)	23-Aug-2022	
Asbestos ID in Solid Samples	24-Aug-2022	24-Aug-2022
Boron Water Soluble	23-Aug-2022	23-Aug-2022
CEN 10:1 Leachate (1 Stage)	20-Aug-2022	
CEN Readings	24-Aug-2022	
Coronene	25-Aug-2022	
Cyanide Comp/Free/Total/Thiocyanate	24-Aug-2022	24-Aug-2022
Dissolved Metals by ICP-MS	25-Aug-2022	
Dissolved Organic/Inorganic Carbon	24-Aug-2022	
EPH by GCxGC-FID	24-Aug-2022	
EPH CWG GC (S)	23-Aug-2022	23-Aug-2022
Fluoride	23-Aug-2022	
GRO by GC-FID (S)	23-Aug-2022	23-Aug-2022
Hexavalent Chromium (s)	22-Aug-2022	22-Aug-2022
Loss on Ignition in soils	23-Aug-2022	
Mercury Dissolved	25-Aug-2022	
Metals in solid samples by OES	24-Aug-2022	24-Aug-2022
Moisture at 105C	20-Aug-2022	
PAH 16 & 17 Calc	25-Aug-2022	
PAH by GCMS	24-Aug-2022	23-Aug-2022
PCBs by GCMS	23-Aug-2022	
pH	23-Aug-2022	23-Aug-2022
pH Value of Filtered Water	23-Aug-2022	
Phenols by HPLC (S)	23-Aug-2022	24-Aug-2022
Phenols by HPLC (W)	24-Aug-2022	
Sample description	20-Aug-2022	19-Aug-2022
Total Organic Carbon	24-Aug-2022	25-Aug-2022
TPH CWG GC (S)	23-Aug-2022	23-Aug-2022
VOC MS (S)	23-Aug-2022	24-Aug-2022



CERTIFICATE OF ANALYSIS

SDG: 220818-64
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Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

APPENDIX F:

Soil Assessment Criteria

Ground and Water Limited

Soil Guideline Values and Generic Assessment Criteria

The Contaminated Land Regime reflects the UK Government's stated objectives of achieving sustainable development through the 'suitable for use approach'. At preliminary risk assessment stage, risks are evaluated qualitatively. As the site investigation progresses to a generic or detailed quantitative risk assessment, data is collected and assessment criteria are utilised to evaluate whether the contaminants represent an unacceptable risk to the identified receptors.

1. Contaminated Land Exposure Assessment Model (CLEA)

Current United Kingdom risk assessment practice is based on the Contaminated Land Exposure Assessment Model (CLEA).

The CLEA Guidance comprises the following documents:

- 1) EA Science Report SC050021/SR2: Human health toxicological assessment of contaminants in soil.
- 2) EA Science Report SC050021/SR3: Updated technical background to the CLEA model.
- 3) EA CLEA Bulletin (2009).
- 4) CLEA software version 1.06 (2009)
- 5) Toxicological reports and SGV technical notes.

The CLEA guidance and tools:

- Do not cover other types of risk to humans, such as fire, suffocation or explosion, or short-term and acute exposures;
- Do not cover risks to the environment, such as groundwater, ecosystems or buildings;
- Do not provide a definitive test for telling when human health risks are significant; and
- Are not a legal requirement in assessing land contamination risks. They are not part of the legal regime for Part 2A of the Environmental Protection Act 1990.

The CLEA guidance derives soil concentrations of contaminants above which (in the opinion of the EA) there may be a concern that warrants further investigation. It does not provide a definitive test for establishing that the risk is significant.

1.1. Land-use Scenarios

The CLEA model uses a range of standard land-use scenarios to develop conceptual exposure models outlined in the following sections.

1.1.1. Residential (with home grown produce) (RwHP)

Generic scenario assumes a typical two-storey house built on a ground bearing slab with a private garden having a lawn, flowerbeds and a small fruit and vegetable patch.

- Critical receptor is a young female child (zero to six years old)
- Exposure duration is six years.
- Exposure pathways include direct soil and indoor dust ingestion, consumption of homegrown produce and any adhering soil, skin contact with soils and indoor dust and inhalation of indoor and outdoor dust and vapours.
- Building type is a two-storey small-terraced house.

A sub-set of this land-use is residential apartments with communal landscaped gardens where the consumption of home grown vegetables will not occur. (Residential without homegrown produce (RwoHP)).

1.1.2. Allotments

Provision of open space (about 250sq.m) commonly made available to tenants by the local authority to grow fruit and vegetable for their own consumption. Typically, there are a number of plots to a site which may have a total area of up to 1 hectare. The tenants are assumed to be adults and that young children make occasional accompanied visits.

Although some allotment holders may choose to keep animals including rabbits, hens, and ducks, potential exposure to contaminated meat and eggs is not considered.

- Critical receptor is a young female child (zero to six years old)
- Exposure duration is six years.
- Exposure pathways include direct soil ingestion, consumption of homegrown produce and any adhering soil, skin contact with soils and inhalation of outdoor dust and vapours.
- There is no building.

1.1.3. Commercial/Industrial

The generic scenario assumes a typical commercial or light industrial property comprising a three-storey building at which employees spend most time indoors and are involved in office-based or relatively light physical work.

- Critical receptor is a working female adult (aged 16 to 65 years old).
- Exposure duration is a working lifetime of 49 years.
- Exposure pathways include direct soil and indoor dust ingestion, skin contact with soils and dusts and inhalation of dust and vapours.
- Building type is a three-storey office (pre 1970).

2. LQM/CIEH Suitable 4 Use Levels (S4UL)

For derivation of these S4UL reference must be made to:

Nathanial, P., McCaffrey, C., Gillet, A., Ogden, R., Nathanial, J., *The LQM/CIEH S4UL's for Human Health Risk Assessment*. Land Quality Press. 2015

2.1. S4UL Background

The Land Quality Management/Chartered Institute of Environmental Health (LQM/CIEH) S4UL for a given land use is the concentration of the contaminant in soil at which the predicted daily exposure,

as calculated by the CLEA software, equals the Health Criteria Value. The S4ULs have been derived for substances based on various generic land use and soil organic matter contents.

The final output for each contaminant represents a synthesis of new toxicological (and fate and transport) reviews published since the preparation of the 2nd edition LQM/CIEH GAC's (Nathanial et al., 2009).

In the derivation of LQM/CIEH S4UL's the principles of 'minimal' or 'tolerable' risk enshrined in SR2, which has not been withdrawn, has been maintained.

2.2. S4UL Land-use

S4UL's have been derived for the basic CLEA land-uses, as described in section 1.2, and for two new land uses:

- Public Open Spaces near Residential Housing (POSresi).
- Public Park (POSpark).

2.2.1. Public Open Spaces near Residential Housing (POSresi)

Includes the predominantly grassed areas adjacent to high density housing, the central green area on many 1930's – 1970's housing estates, and smaller areas commonly incorporated in newer developments as informal grassed areas or more formal landscaped areas with a mixture of open space and covered soils with planting. It is assumed that the close proximity to the place of residence will allow tracking back of soil to occur.

2.2.2. Public Park (POSpark)

An area of open space, usually owned and maintained by the local authority, provided for recreational uses including family visits and picnics, children's play area, informal sporting activities (not a dedicated sports pitch), and dog walking. It is assumed that tracking back of soils into places of residence will be negligible.

The following LQM/CIEH S4ULs (Copyright Land Quality Management Limited) have been reproduced with permission, to the publication number S4UL3072.

3. Category 4 Screening Levels (C4SLs)

In the case of Lead, no SGV or GAC has been published to date. This is likely to be due to the toxicity review that is currently being undertaken by the Environment Agency. In the absence of updated toxicity information the SGV derived using CLEA 1.06 methodology and related toxicity will be used.

The overall objective of the C4SLs research project was to assist the provision of technical guidance in support of Defra's revised Statutory Guidance (SG) for Part 2A of the Environmental Protection Act 1990 (Part 2A) (Defra, 2012a). Specifically, the project aimed to deliver:

- A methodology for deriving C4SLs for four generic land-uses comprising residential, commercial, allotments and public open space; and
- A demonstration of the methodology, via the derivation of C4SLs for six substances – arsenic, benzene, benzo(a)pyrene, cadmium, chromium (VI) and lead.

To help achieve a more targeted approach to identifying and managing contaminated land in relation to the risk (or possibility) of harm to human health, the revised SG presented a new four category

system for considering land under Part 2A, ranging from Category 4, where there is no risk that land poses a significant possibility of significant harm (SPOSH), or the level of risk is low, to Category 1, where the risk that land poses a significant possibility of significant harm (SPOSH) is unacceptably high. More specific guidance on what type of land should be considered as Category 4 (Human Health) is provided in Paragraphs 4.21 and 4.22 of the revised SG, as follows:

“4.21 The local authority should consider that the following types of land should be placed into Category 4: Human Health:

(a) Land where no relevant contaminant linkage has been established.

(b) Land where there are only normal levels of contaminants in soil, as explained in Section 3 of this Guidance.

(c) Land that has been excluded from the need for further inspection and assessment because contaminant levels do not exceed relevant generic assessment criteria in accordance with Section 3 of this Guidance, or relevant technical tools or advice that may be developed in accordance with paragraph 3.30 of this Guidance.

(d) Land where estimated levels of exposure to contaminants in soil are likely to form only a small proportion of what a receptor might be exposed to anyway through other sources of environmental exposure (e.g. in relation to average estimated national levels of exposure to substances commonly found in the environment, to which receptors are likely to be exposed in the normal course of their lives).

4.22 The local authority may consider that land other than the types described in paragraph 4.21 should be placed into Category 4: Human Health if following a detailed quantitative risk assessment it is satisfied that the level of risk posed is sufficiently low.”

The C4SLs are intended as “relevant technical tools” (in relation to Paragraph 4.21(c)) to help local authorities and others when deciding to stop further assessment of a site, on the grounds that it falls within Category 4 (Human Health).

The Impact Assessment (IA), which accompanied the revised SG (Defra, 2012b) provides further information on the nature and potential role of the C4SLs. Paragraph 47(h) of the IA states that:

“The new statutory guidance will bring about a situation where the current SGVs/GACs are replaced with more pragmatic (but still strongly precautionary) Category 4 screening levels (C4SLs) which will provide a higher simple test for deciding that land is suitable for use and definitely not contaminated land.”

A key distinction between the Soil Guideline Values (SGVs) and the C4SLs is the level of risk that they describe. As described by the Environment Agency (2009a):

“SGVs are guidelines on the level of long-term human exposure to individual chemicals in soil that, unless stated otherwise, are tolerable or pose a minimal risk to human health.”

The implication of Paragraph 47(h) of the IA is that minimal risk is well within Category 4 and that the C4SLs should describe a higher level of risk which, whilst not minimal, can still be considered low enough to allow a judgement to be made that land containing substances at, or below, the C4SLs would typically fall within Category 4. This reflects Paragraph 4.20 of the revised SG, which states:

“4.20 The local authority should not assume that land poses a significant possibility of significant harm if it considers that there is no risk or that the level of risk posed is low. For the purposes of this Guidance, such land is referred to as a “Category 4: Human Health” case. The authority may decide that the land is a Category 4: Human Health case as soon as it considers it has evidence to this effect, and this may happen at any stage during risk assessment including the early stages.”

C4SLs, therefore, should not be viewed as “SPOSH levels” and they should not be used as a legal trigger for the determination of land under Part 2A.

The generic screening values referred to before usually take the form of risk-based Soil Guideline Values (SGVs) or other Generic Assessment Criteria (GACs) that are most typically derived using the Environment Agency’s Contaminated Land Exposure Assessment (CLEA) model, as described in the Environment Agency’s SR2, SR3 and SR7 reports (EA, 2009b & c; EA, 2008). It is anticipated that C4SLs will be used in a similar manner; as generic screening criteria that can be used within a GQRA, albeit describing a higher level of risk than the SGVs.

The suggested approach to the development of C4SLs consists of the retention and use of the CLEA framework, modified according to considerations of the underlying science within the context of Defra’s policy objectives relating to the revised SG. Within this context, it is suggested that the development of C4SLs may be achieved in one of three ways, namely:

- By modifying the toxicological parameters used within CLEA (while maintaining current exposure parameters);
- By modifying the exposure parameters embedded within CLEA (while maintaining current toxicological “minimal risk” interpretations); and
- By modifying both toxicological and exposure parameters.

There is also a suggested check on “other considerations” (e.g., background levels, epidemiological data, sources of uncertainty) within the approach, applicable to all three options.

It is suggested that a new term is defined for the toxicological guidance values associated with the derivation of C4SLs – a Low Level of Toxicological Concern (LLTC). A LLTC should represent an intake of low concern that remains suitably protective of health, and definitely does not approach an intake level that could be defined as SPOSH.

4. CL:AIRE Generic Assessment Criteria (GAC)

For derivation of the CL:AIRE Generic Assessment Criteria (GAC) reference should be made to the following report:

CL:AIRE, *The Soil Generic Assessment Criteria for Human Health Risk Assessment. Contaminated Land: Applications in the Real Environment*. 2009.

Within this report, Contaminated Land: Applications in Real Environments (CL:AIRE) provided Generic Assessment Criteria (GAC) in accordance with the CLEA software and the principles outlined previously for a further 35 contaminants sometimes encountered on land affected by contamination.

5. SoBRA Acute GAC

The Society of Brownfield Risk Assessment (SoBRA) identified that most human health risk assessments focus on the chronic risks arising from long-term exposure to specific substances. As chronic risks often occur at lower doses than acute risks, they are often the key drivers, however, in some instances the acute dose may also be an important consideration within risk assessments.

The methodology for deriving the acute GAC were related to two distinct receptor groups:

- Members of the public, where the 'critical' receptor for this group will typically be a female child, which is consistent with CLEA residential and Public Open Space/allotments land-uses;
- Workers involved with excavations. The critical receptor for this group is assumed to be a female working adult, without the use of PPE.

The acute GACs relate to short term exposure of high concentrations of a substance that lead to acute effects. They are not considered to be average exposures across a specific / defined area. As a result, the GACs should be normally be compared with the maximum likely concentration that the individual may be exposed to, and not the average concentration within a specific area.

The SoBRA acute GAC will primarily be used for contaminants that do not currently have any GAC, most notably Cyanide.

6. Detailed Quantitative Risk Assessments (DQRA)

Where the adoption of a GAC is not appropriate, for instance when the intended land-use is at variance the CLEA standard land-uses, then a DQRA may be undertaken to develop site specific values for relevant soil contaminants.

- | |
|---|
| <ul style="list-style-type: none">▪ Establishing the plausibility that generic exposure pathways exist in practice by measurement and observation.▪ Developing more accurate parameters using site data. |
|---|

7. Phytotoxicity

CLEA guidance only addresses human health toxicity; assessment of plant toxicity (phytotoxicity) is based on threshold trigger values obtained from the following source:

- BS3882:2015 – *Specification for Topsoil*

The trigger values are relevant only to those contaminants, where present in excess, have the potential to inhibit plant growth, or kill plants (Cu, Ni and Zn). The criteria have been based on a wide range of planting that are common within a multi-purpose topsoil.

8. Statistical Tests

DEFRA R&D Publication CLR 7 (DOE 1994) addressed the statistical treatment of test results and their comparison to Soil Guideline Values.

Consideration must be given to the appropriate area of land to be considered termed the critical averaging area.

For a communal open space or commercial land-use, the critical averaging area will depend on the proposed layout. For a residential use with private gardens the averaging area is the individual plot.

It may be appropriate to compare the upper 95th percentile concentration with the Soil Guideline Value, subject to applying a statistical test to establish that the range of concentrations are reasonably consistent and belonging to the same underlying distribution of data.

CL:AIRE published guidance in 2020, *Guidance in comparing soil contamination data with a critical concentration*, superseding the CL:AIRE/CIEH 2008 report of the same name. The guidance provides ways to assist land contamination stakeholders to apply statistical methods to their data to enable decisions under the legislative framework; either planning system or Part 2A of the Environmental Protection Act 1990.

The use of the statistical tests should only be applied if the following statements are valid for the datasets:

- Averaging areas, as well as the smallest area of concern have been identified on the basis of the CSM, including the desk study and/or the site walkover;
- The sample locations were chosen using a simple random, stratified random or stratified systematic (square, herringbone or triangular grid) sampling pattern, rather than being targeted to locations suspected of being contaminated;
- The sample locations are relatively evenly spread across the area and are not clustered, to avoid giving undue weight to some parts of the site over others in the calculated statistics;
- The analyses do not suggest a hotspot or outlier of contamination that should be treated as a separate zone. This has been established by a histogram and/or a names statistical test;
- The sample locations are all taken from one population (i.e. the same material);
- Where an averaging zone encompasses several averaging areas, analyses do not show a spatial trend or other spatial pattern across that zone; and
- The number of samples has been shown to be sufficient for a statistical analysis.

Any included statistical spreadsheet is based on an in-house method of statistical analysis, in line with those outlined within the CL:AIRE guidance (2020).

Treatment of Hot-Spots

- A statistical test is applied to establish whether the data is a part of a single set, or whether data outliers are present.
- Provided that the data is based on random sampling and no distinct contamination source was present at the sampling location, the hot-spot(s) may be excluded and the mean of the remaining data assessed.

9. Ground and Water Limited Soil Assessment Criteria

The Soil Assessment Criteria used in the preparation of the Generic Quantitative Risk Assessment are tabulated in the following pages, where the source of each has been outlined in the previous sections.

9.1. Inorganics

SoBRA – Acute Generic Assessment Criteria						
Determinand	RwHP (mg/kg)	RwoHP (mg/kg)	Allotment (mg/kg)	Commercial (mg/kg)	POSresi (mg/kg)	POSpark (mg/kg)
Cyanide	24	24	24	1400	24	24

9.2. Metals

C4SL Low Level of Toxicological Concern						
Determinand	RwHP (mg/kg)	RwoHP (mg/kg)	Allotment (mg/kg)	Commercial (mg/kg)	POSresi (mg/kg)	POSpark (mg/kg)
Lead	< 200	< 310	< 80	< 2300	< 630	< 1300

LQM/CIEH Suitable 4 Use Levels – Metals and Semi-metals						
Determinand	RwHP (mg/kg)	RwoHP (mg/kg)	Allotment (mg/kg)	Commercial (mg/kg)	POSresi (mg/kg)	POSpark (mg/kg)
Arsenic	37	40	43	640	79	170
Beryllium	1.7	1.7	35	12	2.2	63
Boron	290	11000	45	240000	21000	46000
Cadmium	11	85	1.9	190	120	532
Chromium (III)	910	910	18000	8600	1500	33000
Chromium (VI)	6	6	1.8	33	7.7	220
Copper	2400	7100	520	68000	12000	44000
Elemental Mercury	1.2	1.2	21	58	16	30
Inorganic Mercury	40	56	19	1100	120	240
Methylmercury	11	15	6	320	40	68
Nickel	180	180	53	980	230	800
Selenium	250	430	88	12000	1100	1800
Vanadium	410	1200	91	9000	2000	5000
Zinc	3700	40000	620	730000	81000	170000

Phytotoxicity (Harmful to Plants) Threshold Trigger Values			
Determinand	Soil pH < 6.0 (mg/kg)	Soil pH 6.0 – 7.0 (mg/kg)	Soil pH > 7.0 (mg/kg)
Copper	100	135	200
Nickel	60	75	110
Zinc	200	200	300
Notes: BS3882:2015 – <i>Specification for Topsoil</i> . Based on a wide range of common plants that will be exposed to multi-purpose topsoil. Toxicity of contaminant may also be impacted by pH of soils. Site observation of plant vitality may give additional guidance.			

CL:AIRE Soil Generic Assessment Criteria				
Determinand	Residential (mg/kg)	Residential without plant uptake (mg/kg)	Allotment (mg/kg)	Commercial (mg/kg)
Antimony	ND	550	ND	7500
Barium	ND	1300	ND	22000
Molybdenum	ND	670	ND	17000
ND – Not derived				

9.3. Total Petroleum Hydrocarbons (TPHs)

9.3.1. BTEX Compounds

LQM/CIEH Suitable 4 Use Levels – BTEX Compounds							
Determinand	Soil Organic Matter	RwHP (mg/kg)	RwoHP (mg/kg)	Allotment (mg/kg)	Commercial (mg/kg)	POSresi (mg/kg)	POSpark (mg/kg)
Benzene	1.0% SOM	0.087	0.38	0.017	27	72	90
	2.5% SOM	0.170	0.70	0.034	47	72	100
	6.0% SOM	0.370	1.40	0.075	90	73	110
Toluene	1.0% SOM	130	880	22	56000	56000	87000
	2.5% SOM	290	1900	51	110000	56000	95000
	6.0% SOM	660	3900	120	180000	56000	100000
Ethylbenzene	1.0% SOM	47	83	16	5700	24000	17000
	2.5% SOM	110	190	39	13000	24000	22000
	6.0% SOM	260	440	91	27000	25000	27000
o-Xylene	1.0% SOM	60	88	28	6600	41000	17000
	2.5% SOM	140	210	67	15000	42000	24000
	6.0% SOM	330	480	160	33000	43000	33000
m-Xylene	1.0% SOM	59	82	31	6200	41000	17000
	2.5% SOM	140	190	74	14000	42000	24000
	6.0% SOM	320	450	170	31000	43000	33000
p-Xylene	1.0% SOM	56	79	29	5900	41000	17000
	2.5% SOM	130	180	69	14000	42000	23000
	6.0% SOM	310	430	160	30000	43000	31000

SOM = Soil Organic Matter Content (%)

9.3.2. Total Petroleum Hydrocarbons – Aliphatic

LQM/CIEH Suitable 4 Use Levels For TPH							
Aliphatic		RwHP (mg/kg)	RwoHP (mg/kg)	Allotment (mg/kg)	Commercial (mg/kg)	POSresi (mg/kg)	POSpark (mg/kg)
EC 5-6	1.0% SOM	42	42	730	3,200 (304) ^{sol}	570,000 (304) ^{sol}	95,000 (304) ^{sol}
	2.5% SOM	78	78	1,700	5,900 (558) ^{sol}	590,000	130,000 (558) ^{sol}
	6.0% SOM	160	160	3,900	12,000 (1150) ^{sol}	600,000 (1150) ^{sol}	180,000 (1150) ^{sol}
EC >6-8	1.0% SOM	100	100	2,300	7,800 (144) ^{sol}	600,000	150,000 (144) ^{sol}
	2.5% SOM	230	230	5,600	17,000 (322) ^{sol}	610,000	220,000 (322) ^{sol}
	6.0% SOM	530	530	13,000	40,000 (736) ^{sol}	620,000	320,000 (736) ^{sol}
EC >8-10	1.0% SOM	27	27	320	2,000 (78) ^{sol}	13,000	14,000 (78) ^{sol}
	2.5% SOM	65	65	770	4,800 (118) ^{vap}	13,000	18,000 (118) ^{vap}
	6.0% SOM	150	150	1,700	11,000 (451) ^{vap}	13,000	21,000 (451) ^{vap}
EC >10-12	1.0% SOM	130 (48) ^{vap}	130 (48) ^{vap}	2,200	9,700 (48) ^{sol}	13,000	21,000 (48) ^{sol}
	2.5% SOM	330 (118) ^{vap}	330 (118) ^{vap}	4,400	23,000 (118) ^{vap}	13,000	23,000 (118) ^{vap}
	6.0% SOM	760 (283) ^{vap}	760 (283) ^{vap}	7,300	47,000 (283) ^{vap}	13,000	24,000 (283) ^{vap}
EC >12-16	1.0% SOM	1,100 (24) ^{sol}	1,100 (24) ^{sol}	11,000	59,000 (24) ^{sol}	13,000	25,000 (24) ^{sol}
	2.5% SOM	2,400 (59) ^{sol}	2,400 (59) ^{sol}	13,000	82,000 (59) ^{sol}	13,000	25,000 (59) ^{sol}
	6.0% SOM	4,300 (142) ^{sol}	4,400 (142) ^{sol}	13,000	90,000 (142) ^{sol}	13,000	26,000 (142) ^{sol}
EC >16-35	1.0% SOM	65,000 (8.48) ^{sol}	65,000 (8.48) ^{sol}	260,000	1,600,000	250,000	450,000
	2.5% SOM	92,000 (21) ^{sol}	92,000 (21) ^{sol}	270,000	1,700,000	250,000	480,000
	6.0% SOM	110,000	110,000	270,000	1,800,000	250,000	490,000
EC >35-44	1.0% SOM	65,000 (8.48) ^{sol}	65,000 (8.48) ^{sol}	260,000	1,600,000	250,000	450,000
	2.5% SOM	92,000 (21) ^{sol}	92,000 (21) ^{sol}	270,000	1,700,000	250,000	480,000
	6.0% SOM	110,000	110,000	270,000	1,800,000	250,000	490,000

SOM = Soil Organic Matter Content (%)

^{vap} – GAC presented exceeds the vapour saturation limit, which is presented in brackets.

^{sol} – GAC presented exceeds the soil saturation limit, which is presented in brackets.

9.3.3. Total Petroleum Hydrocarbons – Aromatic

LQM/CIEH Suitable 4 Use Levels For TPH							
Aromatic		RwHP (mg/kg)	RwoHP (mg/kg)	Allotment (mg/kg)	Commercial (mg/kg)	POSresi (mg/kg)	POSpark (mg/kg)
EC 5-7 (Benzene)	1.0% SOM	70	370	13	26,000 (1220) ^{sol}	56,000	76,000 (1220) ^{sol}
	2.5% SOM	140	690	27	46,000 (2260) ^{sol}	56,000	84,000 (2260) ^{sol}
	6.0% SOM	300	1,400	57	86,000 (4710) ^{sol}	56,000	92,000 (4710) ^{sol}
EC >7-8 (Toluene)	1.0% SOM	130	860	22	56,000 (869) ^{vap}	56,000	87,000 (869) ^{sol}
	2.5% SOM	290	1,800	51	110,000 (1920) ^{sol}	56,000	95,000 (1920) ^{sol}
	6.0% SOM	660	3,900	120	180,000 (4360) ^{vap}	56,000	100,000 (4360) ^{vap}
EC >8-10	1.0% SOM	34	47	8.6	3,500 (613) ^{vap}	5,000	7,200 (613) ^{vap}
	2.5% SOM	83	110	21	8,100 (1500) ^{vap}	5,000	8,500 (1500) ^{vap}
	6.0% SOM	190	270	51	17,000 (3850) ^{vap}	5,000	9,300 (3580) ^{vap}
EC >10-12	1.0% SOM	74	250	13	16,000 (364) ^{sol}	5,000	9,200 (364) ^{sol}
	2.5% SOM	180	590	31	28,000 (899) ^{sol}	5,000	9,700 (889) ^{sol}
	6.0% SOM	380	1,200	74	34,000 (2150) ^{sol}	5,000	10,000
EC >12-16	1.0% SOM	140	1,800	23	36,000 (169) ^{sol}	5,100	10,000
	2.5% SOM	330	2,300 (419) ^{sol}	57	37,000	5,100	10,000
	6.0% SOM	660	2,500	130	38,000	5,000	10,000
EC >16-21	1.0% SOM	260	1,900	46	28,000	3,800	7,600
	2.5% SOM	540	1,900	110	28,000	3,800	7,700
	6.0% SOM	930	1,900	260	28,000	3,800	7,800
EC >21-35	1.0% SOM	1,100	1,900	370	28,000	3,800	7,800
	2.5% SOM	1,500	1,900	820	28,000	3,800	7,800
	6.0% SOM	1,700	1,900	1,600	28,000	3,800	7,900
EC >35-44	1.0% SOM	1,100	1,900	370	28,000	3,800	7,800
	2.5% SOM	1,500	1,900	820	28,000	3,800	7,800
	6.0% SOM	1,700	1,900	1,600	28,000	3,800	7,900
EC >44-70	1.0% SOM	1,600	1,900	1,200	28,000	3,800	7,800
	2.5% SOM	1,800	1,900	2,100	28,000	3,800	7,800
	6.0% SOM	1,900	1,900	3,000	28,000	3,800	7,900
SOM = Soil Organic Matter Content (%)							
^{vap} – GAC presented exceeds the vapour saturation limit, which is presented in brackets.							
^{sol} – GAC presented exceeds the soil saturation limit, which is presented in brackets.							

9.4. Polycyclic Aromatic Hydrocarbons (PAHs)

LQM/CIEH Suitable 4 Use Levels For Polycyclic Aromatic Hydrocarbons (PAHs)							
Determinands		RwHP (mg/kg)	RwoHP (mg/kg)	Allotment (mg/kg)	Commercial (mg/kg)	POSresi (mg/kg)	POSpark (mg/kg)
Acenaphthene	1.0% SOM	210	3,000 (57.0) ^{sol}	34	84,000(57.0) ^{sol}	15,000	29,000
	2.5% SOM	510	4,700(141) ^{sol}	85	97,000(141) ^{sol}	15,000	30,000
	6.0% SOM	1100	6,000(336) ^{sol}	200	100,000	15,000	30,000
Acenaphthylene	1.0% SOM	170	2,900(86.1) ^{sol}	28	83,000(86.1) ^{sol}	15,000	29,000
	2.5% SOM	420	4,600(212) ^{sol}	69	97,000(212) ^{sol}	15,000	30,000
	6.0% SOM	920	6,000(506) ^{sol}	160	100,000	15,000	30,000
Anthracene	1.0% SOM	2,400	31,000(1.17) ^{vap}	380	520,000	74,000	150,000
	2.5% SOM	5,400	35,000	950	540,000	74,000	150,000
	6.0% SOM	11,000	37,000	2,200	540,000	74,000	150,000
Benzo(a)anthracene	1.0% SOM	7.20	11	2.90	170	29	49
	2.5% SOM	11	14	6.50	170	29	56
	6.0% SOM	13	15	13	180	29	62
Benzo(a)pyrene	1.0% SOM	2.20	3.20	0.97	35	5.70	11
	2.5% SOM	2.70	3.20	2.00	35	5.70	12
	6.0% SOM	3.00	3.20	3.50	36	5.70	13
Benzo(b)fluoranthene	1.0% SOM	2.60	3.90	0.99	44	7.10	13
	2.5% SOM	3.30	4.00	2.10	44	7.20	15
	6.0% SOM	3.70	4.00	3.90	45	7.20	16
Benzo(ghi)perylene	1.0% SOM	320	360	290	3,900	640	1,400
	2.5% SOM	340	360	470	4,000	640	1,500
	6.0% SOM	350	360	640	4,000	640	1,600
Benzo(k)fluoranthene	1.0% SOM	77	110	37	1,200	190	370
	2.5% SOM	93	110	75	1,200	190	410
	6.0% SOM	100	110	130	1,200	190	440
Chrysene	1.0% SOM	15	30	4.10	350	57	93
	2.5% SOM	22	31	9.40	350	57	110
	6.0% SOM	27	32	19	350	57	120
Dibenzo(ah)anthracene	1.0% SOM	0.24	0.31	0.14	3.50	0.57	1.10
	2.5% SOM	0.28	0.32	0.27	3.50	0.57	1.30
	6.0% SOM	0.30	0.32	0.43	3.60	0.58	1.40
Fluoranthene	1.0% SOM	280	1,500	52	23,000	3,100	6,300
	2.5% SOM	560	1,600	130	23,000	3,100	6,300
	6.0% SOM	890	1,600	290	23,000	3,100	6,300
Flourene	1.0% SOM	170	2,800 (30.9) ^{sol}	27	63,000(30.9) ^{sol}	9,900	20,000
	2.5% SOM	400	3,800(76.5) ^{sol}	67	68,000	9,900	20,000
	6.0% SOM	860	4,500(183) ^{sol}	160	71,000	9,900	20,000
Indeno(123-cd)pyrene	1.0% SOM	27	45	9.50	500	82	150
	2.5% SOM	36	46	21	510	82	170
	6.0% SOM	41	46	39	510	82	180
Naphthalene	1.0% SOM	2.30	2.6	4.10	190 (76.4) ^{sol}	4,900	1,200(76.4) ^{sol}
	2.5% SOM	5.60	5.6	10	460 (183) ^{sol}	4,900	1,900(183) ^{sol}
	6.0% SOM	13	13	24	1,100 (432) ^{sol}	4,900	3,000
Phenanthrene	1.0% SOM	95	1,300(183) ^{sol}	15	22,000	3,100	6,200
	2.5% SOM	220	1,500	38	22,000	3,100	6,200
	6.0% SOM	440	1,500	90	23,000	3,100	6,300
Pyrene	1.0% SOM	620	3,700	110	54,000	7,400	15,000
	2.5% SOM	1200	3,800	270	54,000	7,400	15,000
	6.0% SOM	2000	3,800	620	54,000	7,400	15,000
Coal Tar (Benzo(a)pyrene used as marker compound)	1.0% SOM	0.79	1.2	0.32	15	2.20	4.40
	2.5% SOM	0.98	1.2	0.67	15	2.20	4.70
	6.0% SOM	1.10	1.2	1.20	15	2.20	4.80
SOM = Soil Organic Matter Content (%) ^{vap} – GAC presented exceeds the vapour saturation limit, which is presented in brackets. ^{sol} – GAC presented exceeds the soil saturation limit, which is presented in brackets.							

9.5. Volatile and Semi-volatile Organic Compounds

LQM CIEH General Assessment Criteria: Volatile and Semi-Volatile Organic Compounds							
Determinands		RwHP (mg/kg)	RwoHP (mg/kg)	Allotment (mg/kg)	Commercial (mg/kg)	POSresi (mg/kg)	POSpark (mg/kg)
<i>Chloroalkanes & alkenes</i>							
1,2 Dichloroethane	1.0% SOM	0.0071	0.0092	0.0046	0.67	29	21
	2.5% SOM	0.011	0.013	0.0083	0.97	29	24
	6.0% SOM	0.019	0.023	0.016	1.70	29	28
1,1,2,2 Tetrachloroethane	1.0% SOM	1.60	3.90	0.41	270	1,400	1,800
	2.5% SOM	3.40	8.00	0.89	550	1,400	2,100
	6.0% SOM	7.50	17	2.00	1,100	1,400	2,300
1,1,1,2 Tetrachloroethane	1.0% SOM	1.20	1.50	0.79	110	1,400	1,500
	2.5% SOM	2.80	3.50	1.90	250	1,400	1,800
	6.0% SOM	6.40	8.20	4.40	560	1,400	2,100
Tetrachloroethene	1.0% SOM	0.18	0.18	0.65	19	1,400	810 ^{sol} (424)
	2.5% SOM	0.39	0.40	1.50	42	1,400	1,100 ^{sol} (951)
	6.0% SOM	0.90	0.92	3.60	95	1,400	1,500
1,1,1 Trichloroethane	1.0% SOM	8.80	9.00	48	660	140,000	57,000 ^{vap} (1425)
	2.5% SOM	18	18	110	1,300	140,000	76,000 ^{vap} (2915)
	6.0% SOM	39	40	240	3,000	140,000	100,000 ^{vap} (6392)
Tetrachloromethene	1.0% SOM	0.026	0.026	0.45	2.90	890	190
	2.5% SOM	0.056	0.056	1.00	6.30	920	270
	6.0% SOM	0.130	0.130	2.40	14	950	400
Trichloroethene	1.0% SOM	0.016	0.017	0.041	1.20	120	70
	2.5% SOM	0.034	0.036	0.091	2.60	120	91
	6.0% SOM	0.075	0.080	0.210	5.70	120	120
Trichloromethane	1.0% SOM	0.91	1.20	0.42	99	2,500	2,600
	2.5% SOM	1.70	2.10	0.83	170	2,500	2,800
	6.0% SOM	3.40	4.20	1.70	350	2,500	3,100
Vinyl Chloride	1.0% SOM	0.00064	0.00077	0.00055	0.059	3.50	4.80
	2.5% SOM	0.00087	0.00100	0.00100	0.077	3.50	5.00
	6.0% SOM	0.00014	0.00150	0.00180	0.120	3.50	5.40
<i>Explosives</i>							
2,4,6 Trinitrotoluene	1.0% SOM	1.60	65	0.24	1,000	130	260
	2.5% SOM	3.70	66	0.58	1,000	130	270
	6.0% SOM	8.10	66	1.40	1,000	130	270
RDX (Hexogen/Cyclonite/1,3,5-trinitro-1,3,5-triazacyclohexane)	1.0% SOM	120	13,000	17	210,000	26,000	49,000(18.7) ^{sol}
	2.5% SOM	250	13,000	38	210,000	26,000	51,000
	6.0% SOM	540	13,000	85	210,000	27,000	53,000
HMX (Octogen/1,3,5,7-tetrenitro-1,3,5,7-tetrazacyclo-octane)	1.0% SOM	5.70	67,00	0.86	110,000	13,000	23,000(0.35) ^{vap}
	2.5% SOM	13	67,00	1.90	110,000	13,000	23,000(0.39) ^{vap}
	6.0% SOM	26	67,00	3.90	110,000	13,000	24,000(0.48) ^{vap}
Atrazine	1.0% SOM	3.30	610	0.50	9,300	1,200	2,300
	2.5% SOM	7.60	620	1.20	9,400	1,200	2,400
	6.0% SOM	17.40	620	2.70	9,400	1,200	2,400

^{vap} – GAC presented exceeds the vapour saturation limit, which is presented in brackets.
^{sol} – GAC presented exceeds the soil saturation limit, which is presented in brackets.

VOC and SVOC table continued overleaf

VOC and SVOC table continued from previous page

LQM CIEH General Assessment Criteria: Volatile and Semi-Volatile Organic Compounds							
Determinands		RwHP (mg/kg)	RwoHP (mg/kg)	Allotment (mg/kg)	Commercial (mg/kg)	POSresi (mg/kg)	POSpark (mg/kg)
Pesticides							
Aldrin	1.0% SOM	5.70	7.30	3.20	170	18	30
	2.5% SOM	6.60	7.40	6.10	170	18	31
	6.0% SOM	7.10	7.50	9.60	170	18	31
Dieldrin	1.0% SOM	0.97	7.00	0.17	170	18	30
	2.5% SOM	2.00	7.30	0.41	170	18	30
	6.0% SOM	3.50	7.40	0.96	170	18	31
Dichlorvos	1.0% SOM	0.032	6.40	0.0049	140	16	26
	2.5% SOM	0.066	6.50	0.0100	140	16	26
	6.0% SOM	0.140	6.60	0.0220	140	16	27
Alpha - Endosulfan	1.0% SOM	7.40	160(0.003) ^{vap}	1.20	5,600(0.003) ^{vap}	1,200	2,400
	2.5% SOM	18	280(0.007) ^{vap}	2.90	7,400(0.007) ^{vap}	1,200	2,400
	6.0% SOM	41	410(0.016) ^{vap}	6.80	8,400(0.016) ^{vap}	1,200	2,400
Beta - Endosulfan	1.0% SOM	7.00	190(0.00007) ^{vap}	1.10	6,300(0.00007) ^{vap}	1,200	2,400
	2.5% SOM	17	320(0.0002) ^{vap}	2.70	7,800(0.0002) ^{vap}	1,200	2,400
	6.0% SOM	39	440(0.0004) ^{vap}	6.40	8700	1,200	2,500
Alpha - Hexachlorocyclohexanes	1.0% SOM	0.23	6.90	0.035	170	24	47
	2.5% SOM	0.55	9.20	0.087	180	24	48
	6.0% SOM	1.20	11	0.210	180	24	48
Beta - Hexachlorocyclohexanes	1.0% SOM	0.085	3.70	0.013	65	8.10	15
	2.5% SOM	0.200	3.80	0.032	65	8.10	15
	6.0% SOM	0.460	3.80	0.077	65	8.10	16
Gamma - Hexachlorocyclohexanes	1.0% SOM	0.06	2.90	0.0092	67	8.2	14
	2.5% SOM	0.14	3.30	0.0230	69	8.2	15
	6.0% SOM	0.33	3.50	0.0540	70	8.2	15
Chlorobenzenes							
Chlorobenzene	1.0% SOM	0.46	0.46	5.90	56	11,000	1,300(675) ^{sol}
	2.5% SOM	1.00	1.00	14	130	13,000	2,000(1520) ^{sol}
	6.0% SOM	2.40	2.40	32	290	14,000	2,900
1,2-Dichlorobenzene	1.0% SOM	23	24	94	2,000 (571) ^{sol}	90,000	24,000(571) ^{sol}
	2.5% SOM	55	57	230	4,800 (1370) ^{sol}	95,000	36,000(1370) ^{sol}
	6.0% SOM	130	130	540	11,000 (3240) ^{sol}	98,000	51,000(3240) ^{sol}
1,3-Dichlorobenzene	1.0% SOM	0.40	0.44	0.25	30	300	390
	2.5% SOM	1.00	1.10	0.60	73	300	440
	6.0% SOM	2.30	2.50	1.50	170	300	470
1,4-Dichlorobenzene	1.0% SOM	61	61	15	4,400 (224) ^{vap}	17,000 ^g	36,000 (224) ^{vap}
	2.5% SOM	150	150	37	10,000 (540) ^{vap}	17,000 ^g	36,000 (540) ^{vap}
	6.0% SOM	350	350	88 ^g	25,000 (1280) ^{vap}	17,000 ^g	36,000 (1280) ^{vap}
1,2,3,-Trichlorobenzene	1.0% SOM	1.50	1.50	4.70	102	1,800	770(134) ^{vap}
	2.5% SOM	3.60	3.70	12	250	1,800	1,100(330) ^{vap}
	6.0% SOM	8.60	8.80	28	590	1,800	1,600(789) ^{vap}
1,2,4,-Trichlorobenzene	1.0% SOM	2.60	2.60	55	220	15,000	1,700(318) ^{vap}
	2.5% SOM	6.40	6.40	140	530	17,000	2,600(786) ^{vap}
	6.0% SOM	15	15	320	1,300	19,000	4,000(1880) ^{vap}
1,3,5,-Trichlorobenzene	1.0% SOM	0.33	0.33	4.70	23	1,700	380(36.7) ^{vap}
	2.5% SOM	0.81	0.81	12	55	1,700	590(90.8) ^{vap}
	6.0% SOM	1.90	1.90	140	130	1,800	860(217) ^{vap}
^{vap} – GAC presented exceeds the vapour saturation limit, which is presented in brackets.							
^{sol} – GAC presented exceeds the soil saturation limit, which is presented in brackets.							

VOC and SVOC table continued overleaf

VOC and SVOC table continued from previous page

LQM CIEH General Assessment Criteria: Volatile and Semi-Volatile Organic Compounds							
Determinands		RwHP (mg/kg)	RwoHP (mg/kg)	Allotment (mg/kg)	Commercial (mg/kg)	POSresi (mg/kg)	POSpark (mg/kg)
Chlorobenzenes (cont.)							
1,2,3,4,- Tetrachlorobenzene	1.0% SOM	15	24	4.40	1,700(122) ^{vap}	830	1,500(122) ^{vap}
	2.5% SOM	36	56	11	3,080(304) ^{vap}	830	1,600
	6.0% SOM	78	120	26	4,400(728) ^{vap}	830	1,600
1,2,3,5,- Tetrachlorobenzene	1.0% SOM	0.66	0.75	0.38	49(39.4) ^{vap}	78	110(39) ^{vap}
	2.5% SOM	1.60	1.90	0.90	120(98.1) ^{vap}	79	120
	6.0% SOM	3.70	4.30	2.20	240(235) ^{vap}	79	130
1,2,4, 5,- Tetrachlorobenzene	1.0% SOM	0.33	0.73	0.06	42(19.7) ^{sol}	13	25
	2.5% SOM	0.77	1.70	0.16	72(49.1) ^{sol}	13	26
	6.0% SOM	1.60	3.50	0.37	96	13	26
Pentachlorobenzene	1.0% SOM	5.80	19	1.20	640(43.0) ^{sol}	100	190
	2.5% SOM	12	30	3.10	770(107) ^{sol}	100	190
	6.0% SOM	22	38	7.00	830	100	190
Hexachlorobenzene	1.0% SOM	1.80(0.20) ^{vap}	4.10 (0.20) ^{vap}	0.47	110(0.20) ^{vap}	16	30
	2.5% SOM	3.30(0.50) ^{vap}	5.70 (0.50) ^{vap}	1.10	120	16	30
	6.0% SOM	4.90	6.70 (1.2) ^{vap}	2.50	120	16	30
Phenols & Chlorophenols							
BTEX	1.0% SOM	280	750	66	760 ^{dir} (31,000)	760 ^{dir} (11,000)	760 ^{dir} (8,600)
	2.5% SOM	550	1,300	140	1,500 ^{dir} (35,000)	1,500 ^{dir} (11,000)	1,500 ^{dir} (9,700)
	6.0% SOM	1100	2,300	280	3,200 ^{dir} (37,000)	3,200 ^{dir} (11,000)	3,200 ^{dir} (11,000)
Chlorophenols (4 Congeners)	1.0% SOM	0.87	94	0.13	3,500	620	1,100
	2.5% SOM	2.00	150	0.30	4,000	620	1,100
	6.0% SOM	4.50	210	0.70	4,300	620	1,100
Pentachlorophenols	1.0% SOM	0.22	27(16.4) ^{vap}	0.03	400	60	110
	2.5% SOM	0.52	29	0.08	400	60	120
	6.0% SOM	1.20	31	0.19	400	60	120
Others							
Carbon Disulphide	1.0% SOM	0.14	0.14	4.80	11	11,000	1,300
	2.5% SOM	0.29	0.29	10	22	11,000	1,900
	6.0% SOM	0.62	0.62	23	47	12,000	2,700
Hexachloro-1,3- Butadiene	1.0% SOM	0.29	0.32	0.25	31	25	48
	2.5% SOM	0.70	0.78	0.61	68	25	50
	6.0% SOM	1.60	1.80	1.40	120	25	51
^{vap} – GAC presented exceeds the vapour saturation limit, which is presented in brackets.							
^{sol} – GAC presented exceeds the soil saturation limit, which is presented in brackets.							

VOC and SVOC table continued overleaf

VOC and SVOC table continued from previous page

CL:AIRE General Assessment Criteria: Volatile and Semi-Volatile Organic Compounds					
Determinands		RwHP (mg/kg)	RwoHP (mg/kg)	Allotment (mg/kg)	Commercial (mg/kg)
1,1,2 Trichloroethane	1.0% SOM	0.60	0.88	0.28	94
	2.5% SOM	1.20	1.8	0.61	190
	6.0% SOM	2.70	3.9	1.40	400
1,1-Dichloroethane	1.0% SOM	2.40	2.50	9.20	280
	2.5% SOM	3.90	4.10	17	450
	6.0% SOM	7.40	7.70	35	850
1,1-Dichloroethene	1.0% SOM	0.23	0.23	2.80	26
	2.5% SOM	0.40	0.41	5.60	46
	6.0% SOM	0.82	0.82	12	92
1,2,4-Trimethylbenzene	1.0% SOM	0.35	0.41	0.38	42
	2.5% SOM	0.85	0.99	0.93	99
	6.0% SOM	2.00	2.30	2.20	220
1,2-Dichloropropane	1.0% SOM	0.024	0.024	0.62	3.3
	2.5% SOM	0.042	0.042	1.20	5.9
	6.0% SOM	0.084	0.085	2.60	12
2,4-Dimethylphenol	1.0% SOM	19	210	3.10	16000*
	2.5% SOM	43	410	7.20	24000*
	6.0% SOM	97	730	17	30000*
2,4-Dinitrotoluene	1.0% SOM	1.50	170*	0.22	3700*
	2.5% SOM	3.20	170	0.49	3700*
	6.0% SOM	7.20	170	1.10	3800*
2,6-Dinitrotoluene	1.0% SOM	0.78	78	0.12	1900*
	2.5% SOM	1.70	84	0.27	1900*
	6.0% SOM	3.90	87	0.61	1900*
2-Chloronaphthalene	1.0% SOM	3.70	3.80	40	390*
	2.5% SOM	9.20	9.30	98	960*
	6.0% SOM	22	22	230	2200*
Biphenyl	1.0% SOM	66*	220*	14	18000*
	2.5% SOM	160	500*	35	33000*
	6.0% SOM	360	980*	83	48000*
Bis (2-ethylhexyl) phthalate	1.0% SOM	280*	2700*	47*	85000*
	2.5% SOM	610*	2800*	120*	86000*
	6.0% SOM	1100*	2800*	280*	86000*
Bromobenzene	1.0% SOM	0.87	0.91	3.2	97
	2.5% SOM	2.0	2.1	7.6	220
	6.0% SOM	4.7	4.9	18	520
Bromodichloromethane	1.0% SOM	0.016	0.019	0.016	2.1
	2.5% SOM	0.030	0.034	0.032	3.7
	6.0% SOM	0.061	0.070	0.068	7.6
Bromoform	1.0% SOM	2.8	5.2	0.95	760
	2.5% SOM	5.9	11	2.1	1500
	6.0% SOM	13	23	4.6	3100
Butyl benzyl phthalate	1.0% SOM	1400*	42000*	220*	940000*
	2.5% SOM	3300*	44000*	550*	940000*
	6.0% SOM	7200*	44000*	1300*	950000*

*soil concentration above saturation limit

VOC and SVOC table continued overleaf

VOC and SVOC table continued from previous page

CL:AIRE General Assessment Criteria: Volatile and Semi-Volatile Organic Compounds					
Determinands		RwHP (mg/kg)	RwoHP (mg/kg)	Allotment (mg/kg)	Commercial (mg/kg)
Chloroethane	1.0% SOM	8.3	8.4	110	960
	2.5% SOM	11	11	200	1300
	6.0% SOM	18	18	380	2100
Chloromethane	1.0% SOM	0.0083	0.0085	0.066	1.0
	2.5% SOM	0.0098	0.0099	0.13	1.2
	6.0% SOM	0.013	0.013	0.23	1.6
<i>Cis</i> 1,2 Dichloroethene	1.0% SOM	0.11	0.12	0.26	14
	2.5% SOM	0.19	0.20	0.50	24
	6.0% SOM	0.37	0.39	1.0	47
Dichloromethane	1.0% SOM	0.58	2.10	0.10	270
	2.5% SOM	0.98	2.80	0.19	360
	6.0% SOM	1.70	4.50	0.34	560
Diethyl Phthalate	1.0% SOM	120*	1800*	19*	150000*
	2.5% SOM	260*	3500*	41*	220000*
	6.0% SOM	570*	6300*	94*	290000*
Di- <i>n</i> -butyl phthalate	1.0% SOM	13*	450*	2.00	15000*
	2.5% SOM	31*	450*	5.00	15000*
	6.0% SOM	67*	450*	12	15000*
Di- <i>n</i> -octyl phthalate	1.0% SOM	2300*	3400*	940*	89000*
	2.5% SOM	2800*	3400*	2100*	89000*
	6.0% SOM	3100*	3400*	3900*	89000*
Hexachloroethane	1.0% SOM	0.20	0.22	0.27	22*
	2.5% SOM	0.48	0.54	0.67	53*
	6.0% SOM	1.10	1.30	1.60	120*
Isopropylbenzene	1.0% SOM	11	12	32	1400*
	2.5% SOM	27	28	79	3300*
	6.0% SOM	64	67	190	7700*
Methyl <i>tert</i> -butyl ether (MTBE)	1.0% SOM	49	73	23	7900
	2.5% SOM	84	120	44	13000
	6.0% SOM	160	220	90	24000
Propylbenzene	1.0% SOM	34	40	34	4100*
	2.5% SOM	82	97	83	9700*
	6.0% SOM	190	230	200	21000*
Styrene	1.0% SOM	8.10	35	1.60	3300*
	2.5% SOM	19	78	3.70	6500*
	6.0% SOM	43	170	8.70	11000*
Total Cresols (2-, 3-, and 4-methylphenol)	1.0% SOM	80	3700	12	160000
	2.5% SOM	180	5400	27	180000*
	6.0% SOM	400	6900	63	180000*
<i>Trans</i> 1,2 Dichloroethene	1.0% SOM	0.19	0.19	0.93	22
	2.5% SOM	0.34	0.35	1.90	40
	6.0% SOM	0.70	0.71	0.24	81
Tributyl tin oxide	1.0% SOM	0.25	1.40	0.042	130*
	2.5% SOM	0.59	3.10	0.100	180*
	6.0% SOM	1.30	5.70	0.240	200*

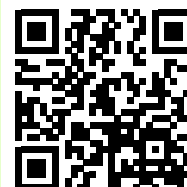
*soil concentration above saturation limit

APPENDIX G: Waste Hazard Assessment

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



N584Z-QQR10-KS36F

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

220818-64

Description/Comments

Project

GWPR4898 807 High Road, London, N17 8ER

Site

807 High Road, London, N17 8ER

Classified by

Name: **Alex Stratford**
 Date: **07 Sep 2022 15:40 GMT**
 Telephone:
 Company: **Ground and Water**
2 The Long Barn, Norton Farm, Selborne
Road
Alton
GU34 3NB

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

Course
 Hazardous Waste Classification

Date

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS2-090822--0.50		Non Hazardous		2
2	WS3-090822--1.00		Non Hazardous		5
3	WS5-090822--1.50		Non Hazardous		7

Related documents

#	Name	Description
1	220818-64.hwol	ALS Hawarden .hwol file used to populate the Job

Report

Created by: Alex Stratford

Created date: 07 Sep 2022 15:40 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	10
Appendix B: Rationale for selection of metal species	11
Appendix C: Version	12

Classification of sample: WS2-090822--0.50

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS2-090822--0.50	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
10% (wet weight correction)	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

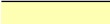
Determinands

Moisture content: 10% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	acenaphthene	201-469-6	83-32-9		<0.008 mg/kg		<0.008 mg/kg		<0.0000008 %		<LOD
2	acenaphthylene	205-917-1	208-96-8		<0.012 mg/kg		<0.012 mg/kg		<0.0000012 %		<LOD
3	anthracene	204-371-1	120-12-7		<0.016 mg/kg		<0.016 mg/kg		<0.0000016 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	13.9 mg/kg	1.32	16.517 mg/kg		0.00165 %	✓	
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.117 mg/kg		0.105 mg/kg		0.0000105 %	✓	
6	benzene	601-020-00-8	200-753-7	71-43-2	<0.009 mg/kg		<0.009 mg/kg		<0.0000009 %		<LOD
7	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.117 mg/kg		0.105 mg/kg		0.0000105 %	✓	
8	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.168 mg/kg		0.151 mg/kg		0.0000151 %	✓	
9	benzo[ghi]perylene	205-883-8	191-24-2		0.0828 mg/kg		0.0745 mg/kg		0.00000745 %	✓	
10	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.0614 mg/kg		0.0553 mg/kg		0.00000553 %	✓	
11	boron { boron tribromide }	005-003-00-0	233-657-9	10294-33-4	<1 mg/kg	23.173	<23.173 mg/kg		<0.00232 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	0.151 mg/kg	1.285	0.175 mg/kg		0.0000136 %	✓	
13	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0	<0.6 mg/kg	1.923	<1.154 mg/kg		<0.000115 %		<LOD
14	chrysene	601-048-00-0	205-923-4	218-01-9	0.117 mg/kg		0.105 mg/kg		0.0000105 %	✓	
15	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	38.5 mg/kg	1.126	39.012 mg/kg		0.0039 %	✓	
16	coronene	205-881-7	191-07-1		<0.2 mg/kg		<0.2 mg/kg		<0.00002 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
17	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
	006-007-00-5									
18	dibenz[a,h]anthracene				<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
19	ethylbenzene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
20	fluoranthene				0.186 mg/kg		0.167 mg/kg	0.0000167 %	✓	
		205-912-4	206-44-0							
21	fluorene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		201-695-5	86-73-7							
22	indeno[123-cd]pyrene				0.0926 mg/kg		0.0833 mg/kg	0.00000833 %	✓	
		205-893-2	193-39-5							
23	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	175 mg/kg		157.5 mg/kg	0.0158 %	✓	
	082-001-00-6									
24	mercury { mercury dichloride }				0.545 mg/kg	1.353	0.664 mg/kg	0.0000664 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
25	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
26	naphthalene				0.0188 mg/kg		0.0169 mg/kg	0.00000169 %	✓	
	601-052-00-2	202-049-5	91-20-3							
27	nickel { nickel dihydroxide }				15.3 mg/kg	1.579	21.75 mg/kg	0.00217 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]							
28	pH				10.8 pH		10.8 pH	10.8 pH		
			PH							
29	phenanthrene				0.0732 mg/kg		0.0659 mg/kg	0.00000659 %	✓	
		201-581-5	85-01-8							
30	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
31	pyrene				0.174 mg/kg		0.157 mg/kg	0.0000157 %	✓	
		204-927-3	129-00-0							
32	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
	034-002-00-8									
33	polychlorobiphenyls; PCB				<0.021 mg/kg		<0.021 mg/kg	<0.0000021 %		<LOD
	602-039-00-4	215-648-1	1336-36-3							
34	toluene				<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
35	vanadium { divanadium pentaoxide; vanadium pentoxide }				27.9 mg/kg	1.785	44.826 mg/kg	0.00448 %	✓	
	023-001-00-8	215-239-8	1314-62-1							
36	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }				56.1 mg/kg	4.398	222.051 mg/kg	0.0222 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
37	xylene				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
38	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				7.68 mg/kg	1.462	10.102 mg/kg	0.00101 %	✓	
		215-160-9	1308-38-9							
Total:								0.0542 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS3-090822--1.00

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS3-090822--1.00	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
6.5% (wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 6.5% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	acenaphthene	201-469-6	83-32-9		<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %		<LOD
2	acenaphthylene	205-917-1	208-96-8		<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %		<LOD
3	anthracene	204-371-1	120-12-7		0.0251 mg/kg		0.0235 mg/kg	0.00000235 %	✓	
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4		12.3 mg/kg	1.32	15.184 mg/kg	0.00152 %	✓	
5	benzo[a]anthracene	601-033-00-9	200-280-6		0.124 mg/kg		0.116 mg/kg	0.0000116 %	✓	
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.114 mg/kg		0.107 mg/kg	0.0000107 %	✓	
7	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.176 mg/kg		0.165 mg/kg	0.0000165 %	✓	
8	benzo[ghi]perylene	205-883-8	191-24-2		0.0843 mg/kg		0.0788 mg/kg	0.00000788 %	✓	
9	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.0602 mg/kg		0.0563 mg/kg	0.00000563 %	✓	
10	boron { boron tribromide }	005-003-00-0	233-657-9		1.09 mg/kg	23.173	23.617 mg/kg	0.00236 %	✓	
11	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1	0.222 mg/kg	1.285	0.267 mg/kg	0.0000208 %	✓	
12	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8		<0.6 mg/kg	1.923	<1.154 mg/kg	<0.000115 %		<LOD
13	chrysene	601-048-00-0	205-923-4		0.114 mg/kg		0.107 mg/kg	0.0000107 %	✓	
14	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7		118 mg/kg	1.126	124.219 mg/kg	0.0124 %	✓	
15	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5			<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
16	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
17	fluoranthene	205-912-4	206-44-0		0.232 mg/kg		0.217 mg/kg	0.0000217 %	✓	
18	fluorene	201-695-5	86-73-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	indeno[123-cd]pyrene	205-893-2	193-39-5		0.106 mg/kg		0.0991 mg/kg	0.00000991 %	✓	
20	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6		1	97.7 mg/kg		91.35 mg/kg	0.00913 %	✓	
21	mercury { mercury dichloride }	080-010-00-X	231-299-8		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
22	naphthalene	601-052-00-2	202-049-5		<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
23	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]		17.2 mg/kg	1.579	25.402 mg/kg	0.00254 %	✓	
24	pH		PH		8.65 pH		8.65 pH	8.65 pH		
25	phenanthrene	201-581-5	85-01-8		0.1 mg/kg		0.0935 mg/kg	0.00000935 %	✓	
26	phenol	604-001-00-2	203-632-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
27	pyrene	204-927-3	129-00-0		0.203 mg/kg		0.19 mg/kg	0.000019 %	✓	
28	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8			<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
29	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8		35.9 mg/kg	1.785	59.922 mg/kg	0.00599 %	✓	
30	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]		87.6 mg/kg	4.398	360.217 mg/kg	0.036 %	✓	
31	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		14.1 mg/kg	1.462	19.268 mg/kg	0.00193 %	✓	
Total:								0.0725 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
🧪	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS5-090822--1.50

✓ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS5-090822--1.50	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
18% (wet weight correction)	

Hazard properties

None identified

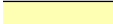
Determinands

Moisture content: 18% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	acenaphthene	201-469-6	83-32-9		<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %		<LOD
2	acenaphthylene	205-917-1	208-96-8		<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %		<LOD
3	anthracene	204-371-1	120-12-7		<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	9.16 mg/kg	1.32	9.917 mg/kg	0.000992 %	✓	
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.028 mg/kg		0.023 mg/kg	0.0000023 %	✓	
6	benzene	601-020-00-8	200-753-7	71-43-2	<0.09 mg/kg		<0.09 mg/kg	<0.000009 %		<LOD
7	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.0247 mg/kg		0.0203 mg/kg	0.00000203 %	✓	
8	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.0387 mg/kg		0.0317 mg/kg	0.00000317 %	✓	
9	benzo[ghi]perylene	205-883-8	191-24-2		<0.024 mg/kg		<0.024 mg/kg	<0.0000024 %		<LOD
10	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
11	boron { boron tribromide }	005-003-00-0	233-657-9	10294-33-4	<1 mg/kg	23.173	<23.173 mg/kg	<0.00232 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	0.278 mg/kg	1.285	0.293 mg/kg	0.0000228 %	✓	
13	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0	<0.6 mg/kg	1.923	<1.154 mg/kg	<0.000115 %		<LOD
14	chrysene	601-048-00-0	205-923-4	218-01-9	0.0296 mg/kg		0.0243 mg/kg	0.00000243 %	✓	
15	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	66.7 mg/kg	1.126	61.579 mg/kg	0.00616 %	✓	
16	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5			<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
17	dibenz[a,h]anthracene				<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
18	ethylbenzene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
19	fluoranthene				0.0536 mg/kg		0.044 mg/kg	0.0000044 %		✓	
		205-912-4	206-44-0								
20	fluorene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-695-5	86-73-7								
21	indeno[123-cd]pyrene				0.024 mg/kg		0.0197 mg/kg	0.00000197 %		✓	
		205-893-2	193-39-5								
22	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	189 mg/kg		154.98 mg/kg	0.0155 %		✓	
	082-001-00-6										
23	mercury { mercury dichloride }				0.642 mg/kg	1.353	0.713 mg/kg	0.0000713 %		✓	
	080-010-00-X	231-299-8	7487-94-7								
24	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
25	naphthalene				<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
26	nickel { nickel dihydroxide }				11.9 mg/kg	1.579	15.413 mg/kg	0.00154 %		✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
27	pH				8.49 pH		8.49 pH	8.49 pH			
			PH								
28	phenanthrene				0.0267 mg/kg		0.0219 mg/kg	0.00000219 %		✓	
		201-581-5	85-01-8								
29	phenol				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
30	pyrene				0.0486 mg/kg		0.0399 mg/kg	0.00000399 %		✓	
		204-927-3	129-00-0								
31	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
	034-002-00-8										
32	toluene				<0.07 mg/kg		<0.07 mg/kg	<0.000007 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
33	vanadium { divanadium pentaoxide; vanadium pentoxide }				21 mg/kg	1.785	30.741 mg/kg	0.00307 %		✓	
	023-001-00-8	215-239-8	1314-62-1								
34	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }				124 mg/kg	4.398	447.181 mg/kg	0.0447 %		✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
35	xylene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
36	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				9.66 mg/kg	1.462	11.577 mg/kg	0.00116 %		✓	
		215-160-9	1308-38-9								
Total:									0.0761 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1 Only the metal concentration has been used for classification	

Appendix A: Classifier defined and non GB MCL determinands

■ acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

■ acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

■ anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23 Jul 2015

Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ coronene (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases; SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.

Data source: <http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en>

Data source date: 16 Jun 2014

Hazard Statements: STOT SE 2; H371

■ salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex

GB MCL index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s):

20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

■ ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4

Description/Comments:

Additional Hazard Statement(s): Carc. 2; H351

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

■ fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ indeno[123-cd]pyrene (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2; H351

▪ **lead compounds with the exception of those specified elsewhere in this Annex (worst case)**

GB MCL index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following MCL protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A

Additional Hazard Statement(s): Carc. 1A; H350

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

▪ **pH (CAS Number: PH)**

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

▪ **phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)**

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

▪ **pyrene (EC Number: 204-927-3, CAS Number: 129-00-0)**

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

▪ **polychlorobiphenyls; PCB (EC Number: 215-648-1, CAS Number: 1336-36-3)**

GB MCL index number: 602-039-00-4

Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.

Additional Hazard Statement(s): Carc. 1A; H350

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

▪ **chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)**

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Most likely worst-case

boron {boron tribromide}

worst-case

cadmium {cadmium sulfide}

Most likely worst-case

chromium in chromium(VI) compounds {chromium(VI) oxide}

Most likely worst-case

copper {dicopper oxide; copper (I) oxide}

Most likely worst-case

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Most likely worst-case

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Most Likely Worst Case

mercury {mercury dichloride}

Most likely worst-case

nickel {nickel dihydroxide}

Most likely worst-case

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Most likely worst-case

vanadium {divanadium pentaoxide; vanadium pentoxide}

Most likely worst-case

zinc {zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2]}

Most Likely Worst Case

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

worst case

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**

HazWasteOnline Classification Engine Version: 2022.245.5317.9942 (02 Sep 2022)

HazWasteOnline Database: 2022.245.5317.9942 (02 Sep 2022)

This classification utilises the following guidance and legislation:

WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020

GB MCL List - version 1.1 of 09 June 2021