

# ENVIRONMENTAL REPORT

Site Address:	Land Adjacent to 2 Ash Grove, Hayes, Middlesex UB3 1JR
Report Date:	June 2025
Project No.:	19607
Prepared for:	Westway Construction Ltd
Planning Application	London Borough of Hillingdon - 79311/APP/2025/468



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## GENERAL NOTES

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

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

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

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

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

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

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

## DOCUMENT INFORMATION AND CONTROL SHEET

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### Document Status and Approval Schedule

<i>Issue No</i>	<i>Status</i>	<i>Date</i>	<i>Prepared by:</i> <i>Rebecca</i> <i>Chamberlain</i> <i>Signature / Date</i>	<i>Technical review</i> <i>by:</i> <i>Chris Gray</i> <i>Signature / Date</i>
1	Final	5 <sup>th</sup> June 2025		



## SUMMARY

Client	Westway Construction Ltd		
Site Location	Land Adjacent to 2 Ash Grove, Hayes, Middlesex UB3 1JR		
Existing Development	Private Garages		
Proposed Development	Conversion of 2 residential dwellings with associated Landscaping and parking.		
Site Settings and Previous Uses	The site area was recorded as a small area of open land from the earliest map reference in 1875 until about 1914 when an orchard is recorded within and around the site. From about 1935 the site and the surrounding area is recorded as residential land where the site forms a section of rear garden. The 1999 aerial photo of the site shows the existing garage building in place within the southeast of the site, this remains in place to date. With residential lane surrounding the site.		
Geological Profile	Hydrological Profile		
	Made Ground	Shallow Made Ground Anticipated	Not Classified
	Boyn Hill Gravel Member	Sand and gravel	Secondary A Aquifer
	London Clay	Clay	Unproductive Aquifer
Nearest Surface Water Feature	The nearest surface water feature is recorded as 438 meters to the west of the site which is recorded as a likely pond within Stockley Park.		
Groundwater Abstractions	The nearest abstraction well is located 815 meters to the southwest of the site which is recorded as a Business Parks: Spray Irrigation – Storage. No potable water supplies are recorded within 1km of the site.		
Source Protection Zone	The site does not lie within a Source Protection Zone.		
Potential Sources of Contamination	<b>Features On Site</b> <ul style="list-style-type: none"> <li>Private Garage with possible ACM</li> <li>Made ground</li> </ul>	<b>Features Off Site</b> <ul style="list-style-type: none"> <li>None</li> </ul>	
Previous Investigations	No reports relating to contaminated land are known to us at the time of writing this report relating to the site.		
Human Health Risk	<p>The site has identified made ground and potentially contaminated ground. These risks form the following layers and associated contamination: -</p> <p><b>FILL:</b> - isolated risk from <b>Asbestos and Lead</b> in made ground in the location of <b>WS2</b>.</p> <p>Based on the above, <b>remedial measures will likely be required areas where pathways to receptors are in place.</b></p>		
Workforce	The above human health risk is in place within the site area, will promote a low risk on a short-term bases to any workforce within the areas. <b>Appropriate PPE / RPE should be worn and the soil contamination risk should be noted within any site inductions. This is particularly relevant to the Asbestos risks.</b>		
Land Gas Risks	No source of land gases are recorded in place within the site.		
Vapour Risks	Chemical testing of the soils show that low risks are in place. Vapour risk is not in place.		
Groundwater Risks	Risks to groundwater is considered low.		
Construction Materials	<p>Water main pipework has been considered and risk has been identified directly to any water main pipework developed at the site.</p> <p><b>Water main pipework can be laid in a protective pipework system.</b></p> <p><b>Any water main pipework should be laid in clean corridors in order to prevent future risk to workforce used in the maintenance and repair of any water main system.</b></p>		
Further Works	<p>It is recommended that additional works will be required for the site in order to complete assessments which are detailed as follows: -</p> <ul style="list-style-type: none"> <li>Additional testing for asbestos and lead within the location of WS2, to aid in the density of sampling, (<i>Considering the size of the site this may not be an economic exercise to isolate small areas depending on the cost of muck away for the asbestos containing soils.</i>)</li> </ul> <p>Submit reports to Local Authority and Environment Agency for review and confirm the risks identified in this report along with the further works proposed are suitable and acceptable.</p> <p>The exact details of remediation required for the site should be assessed and reported in a Remediation Strategy Report in order to comply with current best practice.</p>		

## ENVIRONMENTAL ASSESSMENT - PHASE 2

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

#### **1.1 Introduction**

We have been asked by Westway Construction Ltd to undertake an investigation of the above site in order to assess the potential environmental impact of the historical use of the site on the proposed development. The development of this report has been completed utilising information and assessments completed by HESI developed from a desktop study completed in May 2025.

### **2 Report Objectives**

The objectives of this report are to assess and define the extent of contamination within the site as a result of the investigation works undertaken to date.

The assessment of the site in this report have been prepared in accordance with key guidance documents as follows: -

- National Planning Policy Framework.
- BS 10175:2011+A2:2017, (Investigation of potentially contaminated sites. Code of practice - Code of practice).
- Land contamination risk management (LCRM).
- DEFRA: Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance, (April 2012).
- Environment Agency, (2010) GPLC1 Guidance Principles for Land Contamination.

#### **2.1 Limitations**

The opinions expressed within this document and the comments and recommendations given, are based on the information gained, to date within a desktop study previously undertaken on the site. The interpretation of the data has been made by Herts & Essex Site Investigations.

Within any site investigation, materials sampled represent only a small proportion of the materials present on site. It is therefore possible that other conditions prevailing at the site which have not been revealed within the scope of this report, have not been considered. Where suspect materials are encountered during any further or future works within the site, additional specialist advice should be sought to assess whether any new information will materially affect the recommendations given within any physical ground investigation.

#### **2.2 Planning Condition**

An application is in place with London Borough of Hillingdon as follows:-

Application no: APP/2025/468

Application details: Demolition of existing garage and erection of a 2-bedroom, 3-person dwelling with private amenity space, refuse area and car parking.

Decision: Grant with conditions.



### 3 Site Location and National Grid Reference

The site is located within a residential area of Hayes, the details of which are summarised in Table 1 with the location plan of the site shown in Appendix 3, Sheet 1.

**Table 1** *Site Detail*

<b>Site Address:</b>	Land Adjacent to 2 Ash Grove, Hayes, Middlesex UB3 1JR
<b>Site assessed under</b>	Site Owners Request - Aid as part of planning and warranties.
<b>Current use of land:</b>	Residential land.
<b>Previous use of site, (if known)</b>	As above.
<b>Grid Reference</b>	NGR 508830, 180890
<b>Site Area</b>	0.02 Hectares.
<b>Local Authority</b>	London Borough of Hillingdon Council.
<b>Gradient of the site</b>	The site forms a level area of land.
<b>Proximity of Controlled Waters, (if known)</b>	The nearest surface water feature is recorded as 438 meters to the west of the site area.

### 4 Review of Previous Reports or Documents Relating to the Site

#### 4.1 Site Details

- The site is recorded as a private garage.
- The proposal is to demolition the existing garage and erection of a 2-bedroom dwelling with private amenity space, refuse area and car parking.
- The site area was recorded as a small area of open land from the earliest map reference in 1975 until about 1914 when an orchard is recorded within and around the site. From about 1935 the site and the surrounding area is recorded as residential land where the site forms a section of rear garden. The 1999 aerial photo of the site shows the existing garage building in place within the southeast of the site, this remains in place to date. With residential lane surrounding the site.
- The nearest surface water feature is recorded as 438 meters to the west of the site which is recorded as a likely pond within Stockley Park.
- The nearest abstraction well is located 815 meters to the southwest of the site which is recorded as a Business Parks: Spray Irrigation – Storage. No potable water supplies are recorded within 1km of the site.
- The site does not lie within a Source Protection Zone.

#### 4.2 Risks derived from DTS.

As a result of the works undertaken, the following have been confirmed as:

## Source Risk

### Features On Site

- Private Garage with possible ACM.
- Made ground.

### Features Off Site

- None

## Pathways

Potential pathways in place within the site area recorded as: -

- Dermal Contact.
- Inhalation of dust and fibres.
- Ingestion of dust and fibres via home-grown produce with plant uptake.
- Inhalation of vapours from soils.
- Inhalation of vapours through contaminated groundwaters
- Ingestion of contaminated water through water main pipework.
- Plant Uptake.
- Inhalation Asbestos dust and fibres (from Asbestos within the building).
- Inhalation Asbestos dust and fibres (from asbestos within the soil).

## Receptors

Potential receptors in place within the site area recorded as: -

- Human Health, (Site Development Personnel).
- Human Health, (Residents or staff).
- Adjoining Landowners, (unlikely).
- Flora.
- Groundwater.

## 5 Details of Preparatory Work

Preparatory works had been agreed with the client to gain access and undertake excavations within the site. This incorporates free access across the site area, the proposed investigation was not inhibited in any way and had free access across the site.

## 6 Details of Investigation Objectives.

Within the scope of this report, the objectives will form the following: -

- To anticipate regulatory action and provide sufficient data to overcome and answer any outstanding queries they may raise.
- Provide the relevant authorities sufficient information to satisfy any regulatory requirements set for the site.
- To ensure that the development, on completion, will be fit for the proposed use with all risk assessed and removed.

- It is proposed within this investigation to assess the suitability of the site for a new development which will incorporate residential structure and associated landscaping.
- In order to assess this suitability for development, it is proposed to use a source-pathway-receptor analogy, which, if broken, presents a reduced risk to the development.
- It is proposed to assess, where possible, sources of contamination within the site as a result of historical or ongoing use and whether these uses have pathways to receptors within the proposed development.

## **7** *Summery of Work Undertaken*

The scope of the works involved excavation of boreholes to gain a better and more visual understanding of the site conditions. This was undertaken at locations around the site and broadly confirmed the findings of the visual inspection of the site.

Samples were taken in containers dependent upon the proposed sampling regime required and placed in cool boxes where they were transported directly to the analytical chemist for assessment. These works included the following: -

### **7.1** *Investigation Works Completed*

The focus of the investigation was to confirm risks from the site which are detailed as follows: -

- Assessment of possible Asbestos in soils across the site area.
- Targeted sampling to access risk from the private garage.
- Spatial sampling around the remainder of the site to provide a general assessment.

#### **Initial Investigation – May 2025**

- 3 No Competitor Rig Windowless Sampler borehole sunk to a maximum depth of 2.00 meters - Date of Works – May 2025.
- Chemical Sampling and Testing recovered from samples and sent to analytical chemist, (report date 28/5/25).

### **7.2** *Historic Investigation*

Prior to our involvement in the development of the site, no historic investigations are known to us.

## **8** *Location Plans for Exploratory Excavations*

The plans which detail the location of the site, existing site use, proposed site use and identification of features on the site that may promote a risk are shown in Appendix 1. The plans also confirm the location of the excavations made on the site.

The areas of risk will be dictated by the risk classification given in this report and confirm where risk is in place relevant to the proposed end land use classification.

## **9** *Description of Site Works and on/off Site Observations*

In order to provide an easy understanding of the proposed development, we can confirm that the site will assess as a single section of land with the same proposed residential land use with potential for home grown produce.

The site has been reviewed and we can confirm that the geology within the site is as follows: -

**Table 2** *Geological Profile*

Location	Made Ground	Depths (m)	Natural Soils	Depths (m)
<b>WS1</b>	Moderately compact dark brown silty clayey brick FILL	0.40	Firm to stiff brown slightly silty CLAY	1.30
			Medium dense to dense brown SAND and GRAVEL	2.00+
<b>WS2</b>	Loose dark brown silty claybound topsoil gravel FILL with brick and concrete fragments	0.30	Stiff brown slightly silty CLAY	1.10
	Moderately compact dark brown silty clayey brick FILL	0.50	Medium dense to dense brown slightly claybound SAND and GRAVEL	2.00+
<b>WS3</b>	Loose to compact dark brown red brick rubble FILL	0.50	Stiff brown slightly silty CLAY	1.60
			Medium dense to dense brown slightly claybound SAND and GRAVEL	2.00+

**Table 3** *Groundwater Summary*

Location	Depth Water Struck (m)	Depth of Water (m)	Standing	Rate of Inflow
<b>WS1</b>	DRY			
<b>WS2</b>	DRY			
<b>WS3</b>	DRY			

Any comments in relation to groundwater is based on short term observations. Should groundwater monitoring be required, (which may impact on the development of the site), standpipes and inspections should be requested and completed. All current groundwater comments are based on limited information to date.

The various strata encountered within each test location recorded within the logs forming appendix 2.

At the time of logging the samples recovered from the site a further visual and olfactory inspection has been completed to note any potential sources of contamination or risk. The following was noted:

Although man made products were seen in place within the upper soils no odours or sign of contamination were recorded.

The natural soils did not record any odours or sign of contamination.

Based on the above, the risk assessment and sampling proposals set out within the Desktop Study a suite of chemical tests were completed from across the site area as noted in Table 6 completed was undertaken in line with.

## 10 Contamination Assessment

### 10.1 Contamination

In order to assess the site, the site will be considered based on the historic land use of the site which will depict the extent of testing undertaken to consider risk within the area and additionally, the site will consider the proposed land use for assessment of whether target values have been exceeded for that particular land use.

### 10.2 Human Health Risk

As part of a generic assessment of the subsoil conditions, a comparison has initially been made using Generic Quantitative Assessment Criteria, (GQRA), values for contaminants derived the Environment Agency in Soil Guideline Values released in LCRM, (Land Contamination Risk Management), for Human Health Risk Assessment. For the proposed land use of this site, we can confirm that Generic Quantitative Assessment Criteria have been identified for the site. This is the order in which the Health Criteria Values will be used.

We are aware that the CIEH have published a 'Position Statement' which confirms that they do not wish to be associated with Category 4 screening values under the planning regime and as such would revert back to their own values, although, we are also aware that Local Authorities recommend the use of these value, although this is dependent upon the council EHO. As detailed above, the order of progression will be EA - SGV's, LQM / CIEH Data and then C4SL data.

It is possible that where exceedance of these values are recorded, a more Detailed, Qualitative Risk Assessment, (DQRA), could be completed using site specific scenarios and toxicological properties of the subsoil and site conditions to derive Site Specific Assessment Criteria, (SSAC), for the site. The assessment of testing has been completed as follows and reports the initial risks considered in place compared to GQRA.

For ease of assessment, we can confirm that the site will be considered based on a single zone of development with the following land use: -

<b>Zone 1</b>	<b>The Site</b>	<b>Residential Land Use with Homegrown Produce</b>
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A comparison of the data recovered from the sample analysis against the human health risk assessments for Residential Land Use with Homegrown Produce has been completed, the standards used are shown in the table below and where exceedance of the relevant generic guidance values have been identified, if any, these are detailed within Table 6. A complete copy of all the chemical data is recorded within the appendix of this report.

**Table 4**      **Generic Guidance Values Criteria - Residential Land Use with Home Grown Produce**

<b>Pollutant</b>	<b>Allowable (mg/kg<sup>-1</sup>)</b>	<b>Level</b>	<b>Source</b>
<b>Asbestos</b>	Absent /Present		
<b>Inorganic Arsenic</b>	37		S4UL
<b>Beryllium</b>	1.7		S4UL
<b>Cadmium</b>	11		S4UL
<b>Chromium, (III)</b>	910		S4UL
<b>Chromium, (VI)</b>	6		S4UL
<b>Copper</b>	2400		S4UL
<b>Lead</b>	200		At Risk Soils
<b>Mercury, (Elemental)</b>	1.2		S4UL
<b>Mercury, (Inorganic)</b>	40		S4UL
<b>Mercury, (Methyl)</b>	11		S4UL
<b>Nickel</b>	180		S4UL
<b>Selenium</b>	250		S4UL
<b>Vanadium</b>	410		S4UL
<b>Zinc</b>	3700		S4UL
<b>Boron</b>	290		S4UL
<b>TPH, (Total)</b>	>20 required assessment	Speciated	

<b>Pollutant</b>	<b>Allowable Level (mg/kg-1)</b>			<b>Source</b>
	1% SOM	2.5% SOM	6% SOM	
<b>Naphthalene</b>	2.3	5.6	13	
<b>Acenaphthylene</b>	170	420	920	
<b>Acenaphthene</b>	210	510	1100	
<b>Flourene</b>	170	400	860	
<b>Phenanthrene</b>	95	220	440	
<b>Anthracene</b>	2400	5400	11000	
<b>Flouranthene</b>	280	560	890	
<b>Pyrene</b>	620	1200	2000	
<b>Benzo(a)anthracene</b>	7.2	11	13	S4UL
<b>Chrysene</b>	15	22	27	
<b>Benzo(b)flouranthene</b>	2.6	3.3	3.7	
<b>Benzo(k)flouranthene</b>	77	93	100	
<b>Benzo(a)pyrene</b>	2.2	2.7	3	
<b>Indeno(1,2,3-cd)pyrene</b>	27	36	41	
<b>Dibenzo(ah)anthracene</b>	0.24	0.28	0.3	
<b>Benzo(g,h,i)perylene</b>	320	340	350	
<b>Phenols</b>	280	550	1100	LQM/CIEH (S4UL)



**Table 5**      **TPHs - Generic Guidance Values Criteria - Residential Land Use with Home Grown Produce**

Pollutant	1% Soil Organic Matter	2.5% Soil Organic Matter	6% Soil Organic Matter	Source
Total Petroleum Hydrocarbons				
Aliphatic Fractions				
EC > 5-6	42	78	160	S4UL
EC > 6-8	100	230	530	
EC > 8-10	27	65	150	
EC > 10-12	130	330	760	
EC > 12-16	1100	2400	4300	
EC > 16-35	65000	92000	110000	
EC > 35-44	65000	92000	110000	
Aromatic Fractions				
EC > 5-7	70	140	300	S4UL
EC > 7-8	130	290	660	
EC > 8-10	34	83	190	
EC > 10-12	74	180	380	
EC > 12-16	140	330	660	
EC > 16-21	260	540	930	
EC > 21-35	1100	1500	1700	
EC > 33–44	1100	1500	1700	
Aliphatic & Aromatic				
EC > 44-70	1600	1800	1900	S4UL

Table 6      Sampling and Testing Schedule

Site Details			Sample ID					Testing Suite				Elevated levels of contamination				
												Human Health Risk			Watermain pipework Risk	
Existing Site Use	Proposed Site Use	Chemical Testing Date	stratum sampled	Depth Of Stratum	Sample Location	Sample Depth	Justification	HESI Suite 1*	PAHs, (Speciated)	TPHS, (TPHCWG)	Asbestos	Type Of Asbestos Identified	Quantification	Lead	TPH Total	
				(m b.g.l)		(m)							%	(mg/kg)	(mg/kg)	
Private Garage	Residential dwelling	28/4/22//	FILL	0.40	WS1	0.25 - 0.30	Private Garage	✓	✓	✓	✓	NONE		10	310	
			FILL	0.50	WS2	0.30 - 0.35	Private Garage	✓	✓	✓	✓	Chrysotile detected	<0.001	410	64	
			CLAY	1.10	WS2	0.60 - 0.65	Spatial coverage	✓	✓	✓	✓	NONE		15	<15	
			FILL	0.50	WS3	0.40 - 0.45	Spatial coverage	✓	✓	✓	✓	NONE		31	37	
EXPOSURE LEVELS												Absent/ Presents		200	50 –water main	
* HESI Suite 1 consists of Moisture Content, pH, Electrical Conductivity, Boron Sulfate, (2:1 water soluble), Cyanide, (Free), Cyanide, (Total), Sulphate (Total), Arsenic, Cadmium, Copper, Mercury, Nickel, Lead, Zinc, Chromium (Trivalent), Chromium, (Hexavalent), Phenols. Organic Matter Where PAHs are additionally tested within the VOC List. the highest values have been taken. # As an initial assessment for mercury where appropriate 1.2 mg/kg has been used where levels are elevated further assessments /discussion have been completed within this report. For the purposes of assessment where not stated otherwise Soil Organic Matter values of 2.5% has been used. All measurements are given in mg/kg. - Sample not tested for the contaminant BOLD ITAIC (ORANGE) – denotes where the result is above the relevant exposure level for human health. BOLD (BLUE) – denotes where the result is above the relevant exposure level for watermain pipework. (GREEN) – denotes where results are above Phytotoxic levels based on BS3882:2015																

### 10.3 Sources of Risk within Soils

Based on the information gained, we can confirm that areas of the site have recorded contamination in place above a human health risk level which can be confirmed as follows: -

- Isolated location of Asbestos and Lead risk in the location of WS2.

### 10.4 Human Health Source Conclusions

Risk based on assessments of the site confirm that risk is in place as follows: -

**Table 7 Soil Contamination Risks – Human Health**

Risk Factor		Risks in place	Remediation
Targeted Risks	Asbestos and Lead Risk within the FILL - WS2		Remediation action required.
			Assume as Widespread. OR Additional sampling to comply with BS10175:2011, 5m grid and to confirm risk.
Spatial Risks		None	

### 10.5 Ground and Surface Water Source

The nearest surface water feature is recorded as 438 meters to the west of the site which is recorded as a likely pond within Stockley Park.

The nearest abstraction well is located 815 meters to the southwest of the site which is recorded as a Business Parks: Spray Irrigation – Storage. No potable water supplies are recorded within 1km of the site.

The site does not lie within a Source Protection Zone.

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

Isolated risk from **Asbestos and Lead promotes a low risk to groundwater.**

### 10.6 Land Gas Assessments

In accordance with, BS 10175:2011, BS 8485:2007, CIRIA C665 and CIRIA R149, risks from land gas are not in place and as such, no risk has been identified and no action or testing completed.

## 10.7 Vapour Risks

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

**Table 8 Vapour Risk Assessment - Response Zone**

<i>Feature</i>	<i>Targeted Response Zone</i>	<i>Location to Target</i>	<i>Vapour or Gas risk</i>
Private garage	Made Ground	Site wide	TPHs

Chemical testing has been completed and no elevated level of these vaporous contamination have been recorded in place also when logging and sub-sampling a visual and olfactoral assessment of the soils have been completed, and no contamination that promotes a vapour risk has been encountered within the assessment completed to date.

## 10.8 Water Main Pipework

An assessment of risk in relation to water main pipework has been considered within the scope of the works and considering the pollution measured at the site. Based on a comparison of the WRAS Data and UKWIR, (Guidance for the selection of water supply pipework on brownfield sites), it can be seen that marginal levels of contamination, (In the form of fuels), have been identified and risk is directly in place to water main pipework. This would suggest that any new water main pipework should be installed using Protecta-Line pipework.

Considering the risk to the workforce used in the construction and possible future maintenance of water main pipework, risk is in place based on the standard human health risk, as detailed in Section 10.5. As such, we would suggest that if the site has not undergone full remediation, all water main pipework should be laid in clean corridors to prevent future harm to the workforce used in maintenance of the system. To confirm: -

Water main pipework should be laid in a Protecta-Line pipework system.

Any water main pipework should be laid in clean corridors in order to prevent future risk to workforce used in the maintenance and repair of any water main system.

This should be confirmed by the local statutory authority.

## 10.9 Building Risks

Based on the information shown, we can confirm that the risk from explosive land gases is low based on the information identified. The justification for low ground gas risk has been identified and reviewed in Section 10.6.

Considering the risk from Sulphates to concrete we can confirm that the chemical testing has been completed.

Based on the information gained, we can confirm that a classification of DS1-AC1s should be adopted for the site. This would suggest that a conventional cement mix can be used for the development, although testing of the deeper soils should be completed.

## 10.10 General Source Risk Conclusions

**Table 9**      **Source Risk Conclusions**

Receptor	Source	Pollutant	Location	Action
<b>Human Health Risks</b>				
	Soils	Asbestos Lead	Isolated risk in the location of WS2	Remediation required.
	Workforce	Asbestos Lead	Isolated risk in the location of WS2	PPE, RPE and training required.
	Land Gases	None		
	Vapours	None		
<b>Groundwater Risk</b>				
	Groundwater	None		
<b>Building Materials</b>				
	Soils	TPHs	Widespread risk within the Fill	Protective water main pipework

Additional testing is recommended to further assess the risks found within the location of WS2, to aid in the density of sampling, also to isolate the extent of the targeted risks identified within the site. Considering the size of the site this may not be an economic exercise to isolate small areas.

## 11 Risk Assessment Based on Source Risk

Considering the presence of contamination which has been identified above, we confirm the following outlines the assessment of the site completed and way forward for the site.

**Table 10 Risk Assessment A**

Contaminant	Receptors	Pathways	Mitigation / Discussion
TPHs	Site Users Construction Workers.	Direct contact. Inhalation dust and fibers. Dermal contact	Levels in place are not above a human health risk
		Ingestion of home-grown produce	Levels in place are not above a human health risk
		<b>Ingestion of contaminated water through water main pipework</b>	<b>Remediation required OR Mitigation measure to be installed</b>
		Inhalation of vapours	Levels within the soil are unlikely to promote vapor risks and PID testing is ongoing
		Inhalation of vapours through contaminated ground waters	Risk from the groundwater have not been identified as low based on the information gained.
	Adjoining Landowners	Direct contact. Inhalation dust and fibers. Dermal contact	Levels in place are not above a human health risk and therefore will not impact on adjoining landowners.
		Ingestion of home-grown produce	
		Ingestion of contaminated water through water main pipework	
		Inhalation of vapours	
		Inhalation of vapours through contaminated ground waters	
	Controlled Surface Water;	Leaching, lateral migration of shallow groundwater to a target receptor.	The distance from the site to the surface water feature will reduce the likelihood of risk
	Ground Water. Abstraction Well.	Leaching, migration through fissures / cracks which may migrate to a groundwater receptor.	Based on the levels in place risk to the groundwater is low based on the information gained.
	Flora	Plant Uptake Direct Contact	Based on BS 3882: 2015 there are no allowable levels for TPHs although the levels are not significant as such are unlikely to form a phytotoxic risk.



**Table 11**      **Risk Assessment B**

Contaminant	Receptors	Pathways	Mitigation / Discussion
<b>Asbestos Lead</b>	<b>Site Users Construction Workers.</b>	<b>Direct contact. Inhalation dust and fibers. Dermal contact</b>	<b>Remediation required. Appropriate PPE, RPE and training needed. Appropriate RAMs and MMP.</b>
		<b>Ingestion of home-grown produce</b>	<b>Remediation required.</b>
		<b>Ingestion of contaminated water through water main pipework</b>	<b>Remediation required OR Mitigation measure to be installed.</b>
		Inhalation of vapours	No vapour risk from Asbestos and Lead contamination identified.
		Inhalation of vapours through contaminated ground waters	No vapour risk from Asbestos and Lead contamination identified.
	<b>Adjoining Landowners</b>	Direct contact. Inhalation dust and fibers. Dermal contact	These contaminants are unlikely to be highly mobile and as such are unlikely to impact on the adjoining land.
		Ingestion of home-grown produce	
		Ingestion of contaminated water through water main pipework	
		Inhalation of vapours	
		Inhalation of vapours through contaminated ground waters	
	<b>Controlled Surface Water;</b>	Leaching, lateral migration of shallow groundwater to a target receptor.	The distance from the site to the surface water feature will reduce the likelihood of risk.
	<b>Ground Water. Abstraction Well.</b>	Leaching, migration through fissures / cracks which may migrate to a groundwater receptor.	Based on the levels in place risk to the groundwater is low based on the information gained.

## 12 Implications of the End Use of the Site

Within the assessment of the site completed within this report, we can confirm that existing source – pathway – receptor risk assessments are now in place based on actual site data. Based on the change in use of the site through this proposed development, it is possible that pathways to receptors will be either be removed or enhanced such that risk may be in place / removed.

The end use risks based on pathways are discussed below and relate to the site as a whole: -

**Hard Landscaping** - will effectively cap off any contamination and remove risk, although, the placement of hard surfaces across the site should be confirmed as part of the planning application and not form a system of remediation that homeowners could remove as part of the ongoing habitation.

- **Where Asbestos is in place, full remediation and validation will be required.**
- **Maintain a watching brief. Additional sampling has identified no additional risk and as such, the risk from Asbestos will be low.**

**Soft Landscaping** - will form an area where risk is in place and as such, remedial measures are likely to be required.

- **Where Asbestos is in place, full remediation and validation will be required.**

**Under Buildings** - will effectively cap off any contamination and remove risk.

- **Where Asbestos is in place, full remediation is recommended.**

**Services** - By examination of the UKWIR, (Guidance for the selection of water supply pipes to be used in brownfield sites) we can confirm the risks associated with human health from water main feeds have been considered in place, as such, preventative measures **are likely to** be required for the site. We would suggest that consultation with the relevant statutory authority will be required which may lead to all existing water mains being retained and any new water main installations being in '**Protecta-line**' pipework.

## 13 Outline Remediation Measures

Considering the above, we would suggest that the following outline remediation measures could be employed in order to develop the site based on the existing data. This will be based on the assumption that there is isolated risk within the site are, although further testing is needed to confirm this.

### 13.1 Cover Systems - NHBC

The remedial measures are likely to include one of the following cover systems for the site: -

Engineered cover systems – designed to provide the complete separation of the receptor from the hazard and to perform a number of functions including limiting upward migration of contaminants due to capillary rise and controlling the downward infiltration of water.

Simple cover systems – to provide a reduction of the hazard to human health and to provide a suitable medium for plant growth.

Consultation within NHBC guidance documents, (Cover Systems for Land Regeneration), confirm that maximum depths of cover will be required for residential sites and overcome the inherent issues with earthworm activity, burrowing animals, effects of trees and plants, digging during garden activities and intermixing of leaf fall. Justification of this is included within the NHBC guidance document.

It is also recorded that as part of the review, a questionnaire was sent out to various Developers, Consultants and Regulators who all confirmed variable degrees of cover system based on the level of contamination which ranged from 0.30 meters to 3.00 meters, although, the report by NHBC removes these as conservative and the suggestion of a 0.60 meter cover system adopted by the report as a maximum depth of cover required to be sufficient.

It should be noted that these cover systems do not overcome the risks from soil gases, hydrocarbons, highly elevated Mercury or Arsenic, the groundwater or any controlled waters, significant contamination, deep excavations, services, slopes or areas where rabbit or badger populations are significant.

**Table 12**      **Outline Remediation Measures for end use of the site**

Land Use	Mitigation Measure	Any Additional Works	Depth to remove risk	Confirmation required.
Communal Areas & Shrub Planting Areas.	<b>Isolated Risk from Lead – WS2.</b>  Excavate and remove soils which are assessed to form a risk and placement of clean inert soils to a minimum depth of 0.60 meters. (See Cover Systems above for justification).	Remediation Required.	Excavate a maximum of 0.60 meters of the contaminated layer, (defined within this report as the Made Ground) and confirm the geology at depth.  If the contaminated layer is still in place, recover validation samples from the base of the excavation to confirm the contamination status of the soils for future assessment and record. Lay Geo-textile over this contaminated layer to warn future excavators that risk is present below.	Validation works will be required. Validation of the base of excavation and validation of any soils brought onto the site.
	<b>ASBESTOS– Isolated to WS2 – Additional sampling confirms risk is isolated.</b>  Remediate asbestos risk or fully excavate the removal of Asbestos materials fragments or fibres and complete full validation sampling to confirm risk is removed.  Remediation works should be designed through a REMEDIATION STRATEGY REPORT.	<b>ASBESTOS</b>  Maintain a watching brief through any construction works and ensure all workforce used in the development of the site adhere to strict health and safety regimes in respect to PPE and RPE.	1.00m excavation or full removal and replacement of clean inert soils tested to confirm the infilled soils fall below the human health residential land use standards. OR Install Cobblestone layer within the base of the capping layer if fill is in place at the base.	Complete validation testing to the sides (if pre validation is not completed) and base of the remediation cell.
Hard Landscaping.	Hard landscaping will remove any risks through pathway removal. Must be a permanent feature, (not patio's).  Patio's should assume a soft landscape finish.	confirmation will be required from the Local or relevant Authority that hard landscaping areas will require specific permission to remove any and / or all hard surfaces which may expose contamination to human receptors.		
	<b>ASBESTOS– Isolated to WS2 – Additional sampling confirms risk is isolated.</b>  Fully excavate the removal of Asbestos materials fragments or fibres and complete full validation sampling to confirm risk is removed.  Remediation works should be designed through a REMEDIATION STRATEGY REPORT.	<b>ASBESTOS</b>  Maintain a watching brief through any construction works and ensure all workforce used in the development of the site adhere to strict health and safety regimes in respect to PPE and RPE.	FULLY remove all soils impacted on by Asbestos contamination.	Complete validation testing to the sides (if pre validation is not completed) and base of the remediation cell.
Under Buildings.	<b>ASBESTOS– Isolated to WS2 – Additional sampling confirms risk is isolated.</b>  Fully excavate the removal of Asbestos materials fragments or fibres and complete full validation sampling to confirm risk is removed.  Remediation works should be designed through a REMEDIATION STRATEGY REPORT.	<b>ASBESTOS</b>  Maintain a watching brief through any construction works and ensure all workforce used in the development of the site adhere to strict health and safety regimes in respect to PPE and RPE.	FULLY remove all soils impacted on by Asbestos contamination.	Complete validation testing to the sides (if pre validation is not completed) and base of the remediation cell.
Water Main.	Any new water main installations can be installed using Protecta-Line pipework.  Any new water main pipework should be laid in clean corridors. Full removal of Asbestos should be completed as identified above.	None.	None.	To be confirmed with the relevant statutory authority.
Controlled Waters – Surface Water & Ground Water.	Groundwater risks removed based on the current site condition.  Consider possible future development and pathway creation for contamination to impact on the underlying Secondary Aquifer.			

## 14 Waste Disposal

The Landfill Directive sets rigorous standards to reduce both our reliance on landfill and the environmental impact of wastes disposed of by landfill. Tighter operational and infrastructure standards limit the types and nature of waste that we can send to landfill and place greater restrictions on the location of landfill sites.

The key points are:

- Certain kinds of waste cannot be landfilled.
- Landfills are classified according to whether they can accept hazardous, non-hazardous or inert wastes.
- Wastes can only be accepted at a landfill if they meet the waste acceptance criteria (WAC) for that class of landfill.
- Most wastes must be treated before you can send them to landfill.
- There are formal processes for identifying and checking wastes you must follow before wastes can be accepted at a landfill site.

The Council Decision lays down waste acceptance procedures (WAP). From this foundation landfill operators should build their own site-specific WAP. The Council Decision WAP must be used to determine whether a waste is suitable to go to landfill, and if so, to which class of landfill. The WAP consist of three steps to identify and periodically check the main characteristics of the waste (see Section 9):

- **Level 1:** basic characterisation. Before you can send a load of waste to landfill, you need to know its composition and properties so you can determine whether it is suitable for acceptance and at which class of site (see the Council Decision Annex, paragraph 1.1).
- **Level 2:** compliance testing. If you produce waste that is 'regularly arising', e.g. from an industrial process, you must periodically check the waste to ensure that those properties have not changed (see the Council Decision Annex, paragraph 1.2).
- **Level 3:** on-site verification. The operator must check each delivery at the landfill to verify that it is the expected waste and that it has not been contaminated in storage or transport (see the Council Decision Annex, paragraph 1.3).

Before a waste producer can take waste to a landfill site for disposal, they need to check the landfill site has the appropriate permit and must have completed the following:

- Duty of care transfer note/Hazardous Waste consignment note.
- Pre-treatment declaration form.
- Basic characterisation of the waste, to include:
  - Description of the waste.
  - Waste code (using List of Wastes).
  - Composition of the waste (by testing, if necessary).
  - WAC testing (if required).

## 14.1 WAC Testing

No WAC Testing has been completed at the site. For full classification of the materials for muck away purposes. In line with best practice, we can confirm that the classification and correct disposal of waste should be adhered to in line with Waste Framework Directive. This will include the classification of the waste, appropriate paperwork to be recorded for disposal routes, confirmation of waste classification upon excavation of the waste and validation of its removal.

## 15 Source Risk Conclusions

### HUMAN HEALTH RISK

The site has identified made ground and potentially contaminated ground. These risks form the following layers and associated contamination: -

**FILL:** - isolated risk from **Asbestos and Lead** in made ground in the location of **WS2**

Based on the above, **remedial measures will likely be required areas where pathways to receptors are in place.**

### WORKFORCE

The above human health risk is in place within the site area, will promote a low risk on a short-term bases to any workforce within the areas. **Appropriate PPE / RPE should be worn and the soil contamination risk should be noted within any site inductions. This is particularly relevant to the Asbestos risks.**

### LAND GAS RISKS

No source of land gases are recorded in place within the site.

### VAPOUR RISKS

Chemical testing of the soils show that low risks are in place. Vapour risk is not in place.

### GROUNDWATER RISKS

Risks to groundwater is considered low.

### CONSTRUCTION MATERIALS

Water main pipework has been considered and risk has been identified directly to any water main pipework developed at the site.

**Water main pipework can be laid in a protective pipework system.**

**Any water main pipework should be laid in clean corridors in order to prevent future risk to workforce used in the maintenance and repair of any water main system.**



## **FURTHER WORKS**

It is recommended that additional works will be required for the site in order to complete assessments which are detailed as follows: -

- Additional testing for asbestos and lead within the location of WS2, to aid in the density of sampling, *(Considering the size of the site this may not be an economic exercise to isolate small areas depending on the cost of muck away for the asbestos containing soils.)*

Submit reports to Local Authority and Environment Agency for review and confirm the risks identified in this report along with the further works proposed are suitable and acceptable.

The exact details of remediation required for the site should be assessed and reported in a Remediation Strategy Report in order to comply with current best practice.

# **APPENDIX A**

# **CONCEPTUAL MODEL**

## Land Adjacent to 2 Ash Grove, Hayes, Middlesex UB3 1JR

### Site Conceptual Model - Proposed Site Plan

#### Potential Pathways

##### Human Health

- ① Direct contact with contaminants in soil/dust or water
- ② Inhalation of contaminants through soil/dust/particles
- ③ Dermal Contact
- ④ Ingestion of home grown produce
- ⑤ Ingestion of contaminated water through water main pipework
- ⑥ Inhalation of Land Gases / Vapours From Soils
- ⑦ Inhalation of Vapours from Groundwater
- ⑧ Migration to off site Adjoining Land Owners

##### Flora

- ⑨ Plant uptake & direct contact with soil

##### Controlled Surface Water, Ground Water & Abstraction Well

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

##### Off Site Sources

- A Migration of contamination to the site area
- B Migration of land gases/ vapours to the site area
- C Migration of contaminated groundwater to the site area

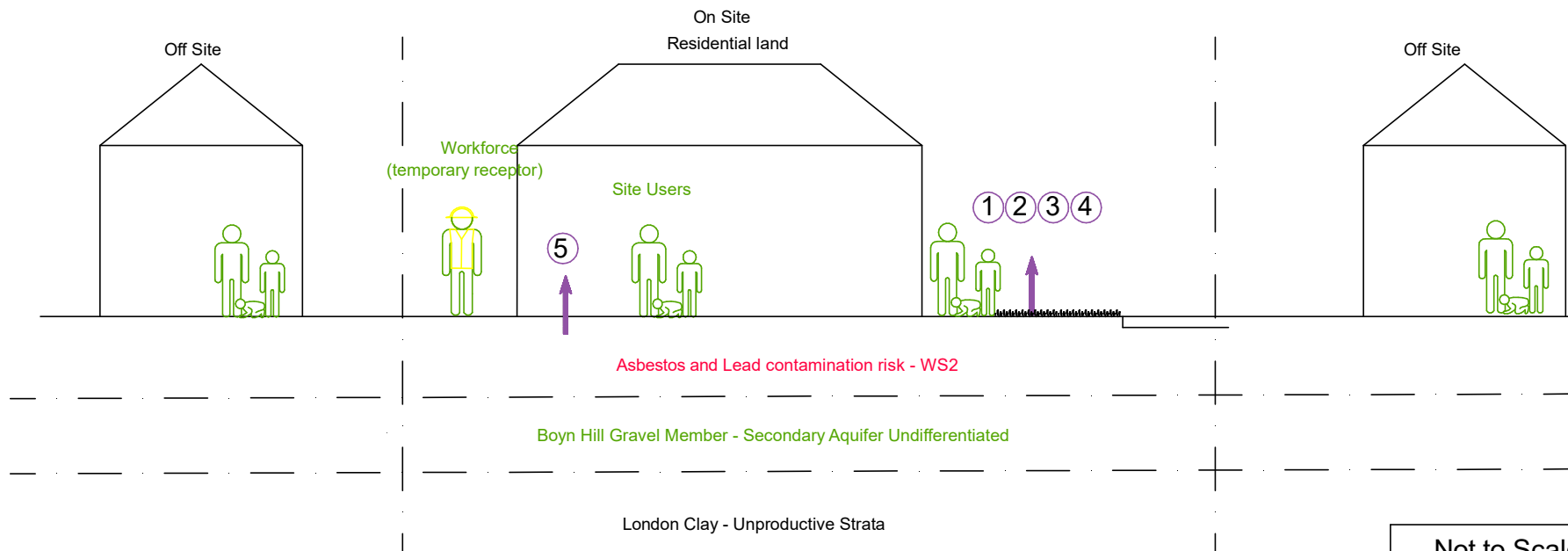
#### Key

Purple =Possible pathways

Green =Possible receptors

Red =Possible sources

Grey = Not in place within this site



Not to Scale  
Sketch No. : ENV / 19607 / 01 / 01

# **APPENDIX ONE**

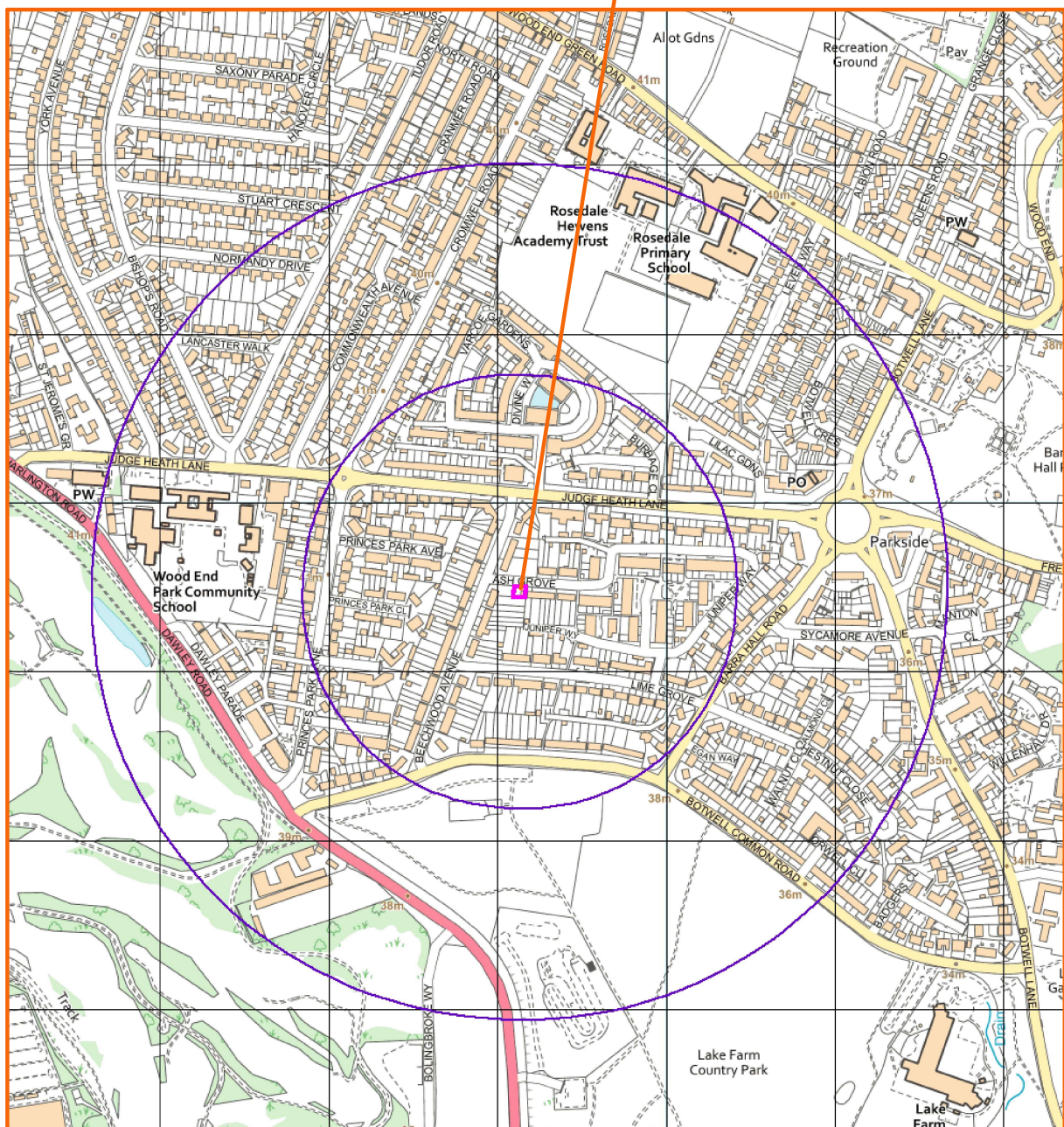
## **SITE PLANS**

## Land Adjacent to 2 Ash Grove, Hayes, Middlesex UB3 1JR

### Location Plan



The site

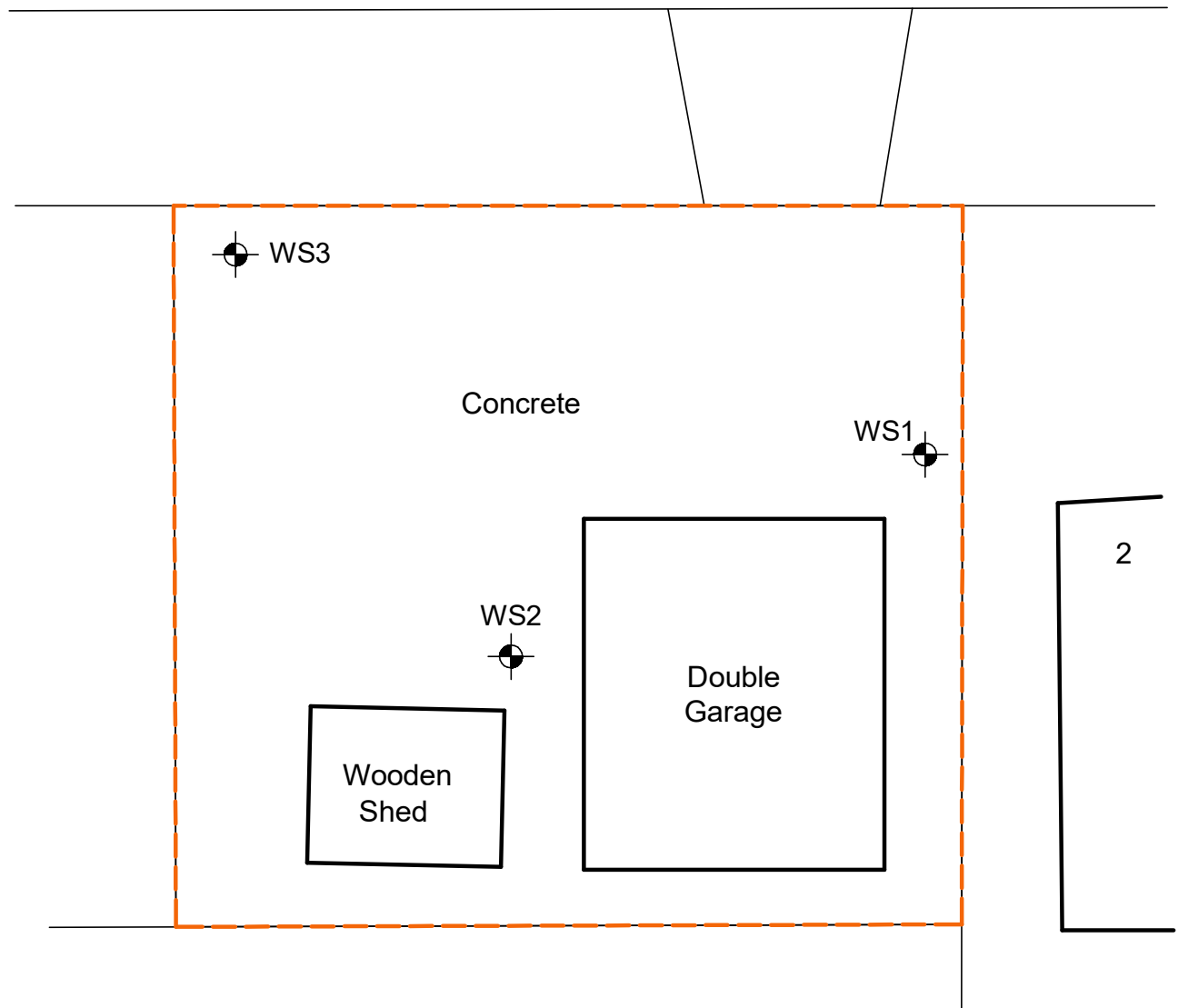


## Land Adjacent to 2 Ash Grove, Hayes, Middlesex UB3 1JR

### Existing Site Plan



Ash Grove



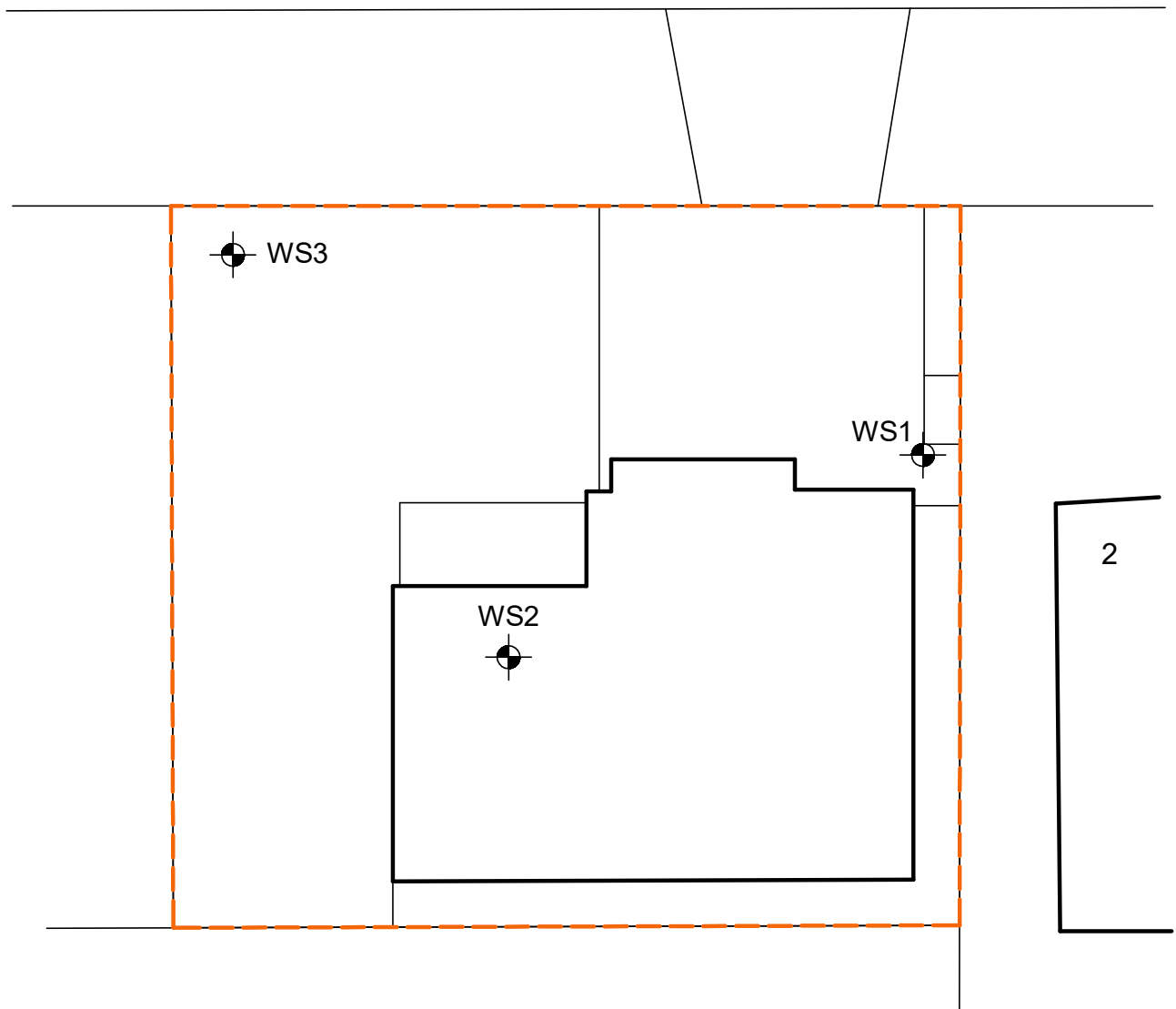


Land Adjacent to 2 Ash Grove, Hayes, Middlesex UB3 1JR

Proposed Site Plan



Ash Grove



# **APPENDIX TWO**

## **LOGS**



Appendix No	2
Sheet No	1
Job No	19607
Date	May 2025

## Window Sample One

Description Of Stratum	Legend	Depth	Thickness (m)	Water Level	Samples			S.P.T N-Value or Vane Strength	VOC's (ppm)	Installations	Casing Depth, (m)
					No	Type	Depth (m)				
Concrete		0.20	0.20	DRY	1	U	GL - 1.00				
Moderately compact dark brown silty clayey brick FILL		0.40	0.20								
Firm to stiff brown slightly silty CLAY			0.90								
		1.30									
Medium dense to dense brown SAND and GRAVEL			0.70								
		2.00			2	U	1.00-2.00	N=50+			1.00
Borehole Complete at 2.00m Roots to 0.50m											

Remarks

Key : U - Undisturbed Sample  
(100mm diameter)

B - Bulk Sample  
 - Water Struck

D - Disturbed Sample  
 - Water Standing

W - Water Sample  
T - Chemical Tub


N - SPT N-Value  
V - Vane Test, (kN.m<sup>2</sup>)


Land Adjacent to 2 Ash Grove, Hayes, Middlesex UB3 1JR

Window Sample Two

Description Of Stratum	Legend	Depth	Thickness (m)	Water Level	Samples			S.P.T N-Value or Vane Strength	VOC's (ppm)	Installations	Casing Depth, (m)
					No	Type	Depth (m)				
Concrete		0.10	0.10	DRY	1	U	GL - 1.00				
Loose dark brown silty claybound topsoil gravel FILL with brick and concrete fragments		0.30	0.20								
Moderately compact dark brown silty clayey brick FILL		0.50	0.20								
Stiff brown slightly silty CLAY		1.10	0.60		2	U	1.00-2.00				1.00
Medium dense to dense brown slightly claybound SAND and GRAVEL		2.00	0.90								
Borehole Complete at 2.00m Roots to 0.90m							2.00	N=50+			
Remarks											

Key : U - Undisturbed Sample  
(100mm diameter)

B - Bulk Sample  
 - Water Struck

D - Disturbed Sample  
 - Water Standing

W - Water Sample  
T - Chemical Tub

N - SPT N-Value  
V - Vane Test, (kN.m<sup>2</sup>)

Land Adjacent to 2 Ash Grove, Hayes, Middlesex UB3 1JR

Window Sample Three

Description Of Stratum	Legend	Depth	Thickness (m)	Water Level	Samples			S.P.T N-Value or Vane Strength	VOC's (ppm)	Installations	Casing Depth, (m)
					No	Type	Depth (m)				
Concrete		0.20	0.20	DRY	1	U	GL - 1.00				
Loose to compact dark brown red brick rubble FILL		0.50	0.30								
Stiff brown slightly silty CLAY											
			1.10		2	U	1.00-2.00				1.00
		1.60									
Medium dense to dense brown slightly claybound SAND and GRAVEL		2.00	0.40								
Borehole Complete at 2.00m Roots to 1.00m							2.00	N=50+			
Remarks											

# **APPENDIX THREE**

## **CHEMICAL TESTING**



Herts & Essex Site Investigations  
The Old Post Office  
Wellpond Green  
Standon  
Herts  
SG11 1NJ

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e: reception@i2analytical.com

## **Analytical Report Number : 25-025878**

<b>Project / Site name:</b>	Land Adjacent to 2 Ash Grove, Hayes, Middlesec UB9 6EX	<b>Samples received on:</b>	19/05/2025
<b>Your job number:</b>	19607	<b>Samples instructed on/ Analysis started on:</b>	19/05/2025
<b>Your order number:</b>	19607	<b>Analysis completed by:</b>	28/05/2025
<b>Report Issue Number:</b>	1	<b>Report issued on:</b>	28/05/2025
<b>Samples Analysed:</b>	4 soil samples		



**Signed:**

Anna Goc  
PL Head of Reporting Team  
**For & on behalf of i2 Analytical Ltd.**

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting  
leachates - 2 weeks from reporting  
waters - 2 weeks from reporting  
asbestos - 6 months from reporting  
air - once the analysis is complete

Excel copies of reports are only valid when accompanied by this PDF certificate.

Retention period for records and reports is minimum 6 years from the date of issue of the final report.  
Some records may be kept for longer according to other legal/best practice requirements.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.  
Application of uncertainty of measurement would provide a range within which the true result lies.  
An estimate of measurement uncertainty can be provided on request.



Analytical Report Number: 25-025878

Project / Site name: Land Adjacent to 2 Ash Grove, Hayes, Middlesec UB9 6EX

Your Order No: 19607

Lab Sample Number	551096	551097	551098	551099
Sample Reference	WS1	WS2	WS2	WS3
Sample Number	HC FILL	HC FILL	CLAY	HC FILL
Water Matrix	N/A	N/A	N/A	N/A
Depth (m)	0.25	0.3	0.6	0.4
Date Sampled	16/05/2025	16/05/2025	16/05/2025	16/05/2025
Time Taken	930	930	930	930
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Stone Content	%	0.1	NONE	39.7	63.3	< 0.1	57.5
Moisture Content	%	0.01	NONE	3.1	5.8	15	10
Total mass of sample received	kg	0.1	NONE	1.4	1.3	1.4	1.3

#### Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	KWB	KWB	KWB	KWB
Analysis completed	N/A	N/A	N/A	28/05/2025	28/05/2025	28/05/2025	28/05/2025
Actinolite detected	Type	N/A	ISO 17025	-	Not-detected	-	-
Amosite detected	Type	N/A	ISO 17025	-	Not-detected	-	-
Anthophyllite detected	Type	N/A	ISO 17025	-	Not-detected	-	-
Chrysotile detected	Type	N/A	ISO 17025	-	Detected	-	-
Crocidolite detected	Type	N/A	ISO 17025	-	Not-detected	-	-
Tremolite detected	Type	N/A	ISO 17025	-	Not-detected	-	-

Asbestos % by hand picking/weighing	%	0.001	ISO 17025	-	< 0.001	-	-
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Asbestos Containing Material Types Detected (ACM)	Type	N/A	ISO 17025	-	Loose Fibres	-	-
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#### General Inorganics

pH (L099)	pH Units	N/A	MCERTS	10.9	9.1	8.2	11.7
Organic Matter (automated)	%	0.1	MCERTS	2.6	1.3	0.6	0.7

#### Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
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#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.07	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.08	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.29	0.85	< 0.05	0.09
Anthracene	mg/kg	0.05	MCERTS	0.11	0.13	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.85	1.3	< 0.05	0.18
Pyrene	mg/kg	0.05	MCERTS	0.85	1.3	< 0.05	0.15
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.63	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.42	0.7	< 0.05	0.08
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.65	1.1	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.24	0.29	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.61	0.8	< 0.05	0.11
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.29	0.44	< 0.05	0.08
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.31	0.53	< 0.05	0.09

#### Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	4.67	8.21	< 0.80	< 0.80
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Analytical Report Number: 25-025878

Project / Site name: Land Adjacent to 2 Ash Grove, Hayes, Middlesec UB9 6EX

Your Order No: 19607

Lab Sample Number	551096	551097	551098	551099
Sample Reference	WS1	WS2	WS2	WS3
Sample Number	HC FILL	HC FILL	CLAY	HC FILL
Water Matrix	N/A	N/A	N/A	N/A
Depth (m)	0.25	0.3	0.6	0.4
Date Sampled	16/05/2025	16/05/2025	16/05/2025	16/05/2025
Time Taken	930	930	930	930
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

#### Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.8	11	13	11
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.38	0.64	1	1.2
Boron (total)	mg/kg	1	MCERTS	7.6	8.1	10	29
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.4	< 0.2	0.4
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	15	20	35	30
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16	21	35	30
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	24	19	22
Lead (aqua regia extractable)	mg/kg	1	MCERTS	10	410	15	31
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	14	26	19
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.3	1.2
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	34	30	51	47
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	26	220	58	81

#### Petroleum Hydrocarbons

TPHCWG - Aliphatic >EC5 - EC6 <sub>HS_ID_AL</sub>	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC6 - EC8 <sub>HS_ID_AL</sub>	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC8 - EC10 <sub>HS_ID_AL</sub>	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aliphatic >EC10 - EC12 <sub>EH_CU_ID_AL</sub>	mg/kg	1	MCERTS	2.5	2.4	< 1.0	4
TPHCWG - Aliphatic >EC12 - EC16 <sub>EH_CU_ID_AL</sub>	mg/kg	2	MCERTS	3.8	3.7	< 2.0	4.4
TPHCWG - Aliphatic >EC16 - EC21 <sub>EH_CU_ID_AL</sub>	mg/kg	8	MCERTS	9.2	17	< 8.0	19
TPHCWG - Aliphatic >EC21 - EC35 <sub>EH_CU_ID_AL</sub>	mg/kg	8	MCERTS	90	20	< 8.0	130
TPHCWG - Aliphatic >EC5 - EC35 <sub>EH_CU+HS_ID_AL</sub>	mg/kg	10	NONE	110	43	< 10	160

TPHCWG - Aromatic >EC5 - EC7 <sub>HS_ID_AR</sub>	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC7 - EC8 <sub>HS_ID_AR</sub>	mg/kg	0.01	MCERTS	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC8 - EC10 <sub>HS_ID_AR</sub>	mg/kg	0.02	MCERTS	< 0.020	< 0.020	< 0.020	< 0.020
TPHCWG - Aromatic >EC10 - EC12 <sub>EH_CU_ID_AR</sub>	mg/kg	1	MCERTS	2.9	2.3	< 1.0	1.2
TPHCWG - Aromatic >EC12 - EC16 <sub>EH_CU_ID_AR</sub>	mg/kg	2	MCERTS	4.3	< 2.0	< 2.0	< 2.0
TPHCWG - Aromatic >EC16 - EC21 <sub>EH_CU_ID_AR</sub>	mg/kg	10	MCERTS	14	< 10	< 10	< 10
TPHCWG - Aromatic >EC21 - EC35 <sub>EH_CU_ID_AR</sub>	mg/kg	10	MCERTS	170	19	< 10	30
TPHCWG - Aromatic >EC5 - EC35 <sub>EH_CU+HS_ID_AR</sub>	mg/kg	10	NONE	200	21	< 10	32

#### VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



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**Analytical Report Number:** 25-025878  
**Project / Site name:** Land Adjacent to 2 Ash Grove, Haye  
**Your Order No:** 19607

## Certificate of Analysis - Asbestos Quantification

### Methods:

#### Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

#### Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample	Analysis completed	Analyst ID
551097	WS2	0.30-	184	Loose Fibres	Chrysotile	< 0.001	< 0.001	28/05/2025	KWB

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

**Analytical Report Number : 25-025878**

**Project / Site name: Land Adjacent to 2 Ash Grove, Hayes, Middlesec UB9 6EX**

\* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
551096	WS1	HC FILL	0.25	Brown sand with gravel and stones
551097	WS2	HC FILL	0.3	Brown sandy loam with vegetation and stones
551098	WS2	CLAY	0.6	Brown clay and sand with gravel
551099	WS3	HC FILL	0.4	Brown sand with gravel and stones

**Analytical Report Number : 25-025878**

**Project / Site name: Land Adjacent to 2 Ash Grove, Hayes, Middlesec UB9 6EX**

**Water matrix abbreviations:**

**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)**

**Final Sewage Effluent (FSE) Landfill Leachate (LL)**

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088-PL	D/W	MCERTS
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080-PL/L130B	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

**Analytical Report Number : 25-025878**

**Project / Site name: Land Adjacent to 2 Ash Grove, Hayes, Middlesec UB9 6EX**

**Water matrix abbreviations:**

**Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)**

**Final Sewage Effluent (FSE) Landfill Leachate (LL)**

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references	HSE Report No: 83/1996, HSG 248 (2021), HSG 264 (2012) & SCA Blue Book (draft)	A006B	D	ISO 17025

**For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).**

**For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).**

**For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.**

**Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.**

**Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.**

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution