ENVIRONMENTAL REPORT

Site Address:	Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT
Report Date:	November 2023
Project No.:	18610
Prepared for:	LW Developments Ltd
Planning Application	East Herts Council - 3/23/1881/FUL

CONTENTS

APPENDIXES

TABLES AND FIGURES

LIST OF ABBREVIATIONS

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

GENERAL NOTES

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

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

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

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

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

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

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

DOCUMENT INFORMATION AND CONTROL SHEET

Client

LW Developments Ltd
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Qualifications

C.S.Gray

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

Document Status and Approval Schedule

Issue No	*Status*	*Date*	*Prepared by: Rebecca Chamberlain*	*Technical review by: Chris Gray*
1	Final	November 2023	[redacted]	

SUMMARY

Client	LW Developments Ltd
Site Location	Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT
Existing Development	Open land formally a residential house and associated landscaping. Numerous trees surround the site.
Proposed Development	The proposed site construction forms the development of five new private residential houses with associated landscaping and access. Plans have been provided as to the extent of these works in the reporting completed below
Site Settings and Previous Uses	The site is identified as open land from the earliest map record in 1877 until 1923 when residential land was developed on the site/Additional buildings were added in 1976 which remained in place until present day. Surrounding the site, open land is in place. A pond is recorded 50 meters to the south of the site which is infilled in 1976. A farm is located 130 meters to the southeast from the earliest map record until present day. Residential housing is also recorded surrounding the site from 1976 to present.

Geological and Hydrological Profile	**Geology**		**Aquifer Classification**
	Made Ground	Shallow Made Ground Anticipated	Not Classified
	Glaciofluvial Deposits	Clay over Sandy CLAY	Secondary Aquifer
	Lewes Nodular Chalk	Chalk, (Not Encountered)	Principal Aquifer

Nearest Surface Water Feature	The nearest surface water feature is recorded as on site which is likely formed by a ditch.
Groundwater Abstractions	No groundwater abstraction wells are recorded within the site area up to 1000 meters away
Source Protection Zone	The site lies within a Source Zone III Protection Zone. A Source Zone II protection zone is located 999 meters to the north of the site
Potential Sources of Contamination	***Features On Site*** • ***Access road & Parking –Ruled out as a risk*** ***Features Off Site*** • ***Infilled Pond, 50m, S–Ruled out as a risk***
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	***No elevated levels of contamination are recorded within the site area.***
Workforce	The lack of human health risk is in place within the site area, will promote a low risk to any workforce within the areas. ***Appropriate PPE / RPE should be worn.***
Groundwater Risks	No sources of risk are recorded in place within the site area - ***risks to groundwater is not in place.***
Vapour Risks	Chemical testing of the soils show that no risks are in place. ***Vapour risk is not in place.***
Gas Risks	No sources of land gas risk are recorded in place.
Construction Materials	Construction materials have been considered and no risk has been identified directly to any water main pipework developed at the site. • ***Water main pipework can be laid in a conventional 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	***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.*** ***Maintain a watching brief as follows:-*** It should be noted that this investigation is undertaken in order to identify the extent of contamination as a result of historic and ongoing use. Should any areas of the site be encountered within the development that appear potentially contaminated through visual or olfactory assessment outside that discussed within this report, consultation with ourselves should be undertaken in order to identify the risk associated with the material.

ENVIRONMENTAL ASSESSMENT - PHASE 2

1 Context and Objectives of this report

1.1 Introduction

We have been asked by LW Developments 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 desk top study completed in October 2023.

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.
- British Standards 10175:2011+A2:2017
- Land contamination risk management (LCRM)
- Contaminated Land Report, (CLR11) 11, 'Model Procedures for the Management of Contaminated Land', (2004).
- DEFRA: Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance, (April 2012)
- Environment Agency, (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 East Herts District Council as follows:-

Decision Notice : 3/23/1881/FUL
Demolition of existing buildings, construction of 5 x 3-bedroom chalet bungalows, access road, landscaping and supporting infrastructure.

2.3 Decision Notice Relating to Contaminated Land

Condition 3.

Prior to the commencement of the development hereby approved a scheme to deal with contamination of land and/or groundwater shall be submitted to and approved by the Local Planning Authority and the development should be implemented in accordance with the approved scheme. The scheme shall include all of the following measures unless the Local Planning Authority dispenses with any such requirement specifically and in writing:

1. A desk-top study carried out by a competent person to identify and evaluate all potential sources and impacts of land and/or groundwater contamination relevant to the site. The requirements of the Local Planning Authority shall be fully established before the desktop study is commenced and it shall conform to any such requirements. Copies of the desk-top study shall be submitted to the Local Planning Authority without delay upon completion.

2. A site investigation shall be carried out by a competent person to fully and effectively characterise the nature and extent of any land and/or groundwater contamination and its implications. The site investigation shall not be commenced until

(i) A desk-top study has been completed satisfying the requirements of paragraph (1) above;

(ii) The requirements of the Local Planning Authority for site investigations have been fully established; and

(iii) The extent and methodology have been agreed in writing with the Local Planning Authority. Copies of a report on the completed site investigation shall be submitted to the Local Planning Authority without delay on completion.

3. A written method statement for the remediation of land and/or groundwater contamination affecting the site shall be agreed in writing with the Local Planning Authority prior to commencement and all requirements shall be implemented and completed to the satisfaction of the Local Planning Authority by a competent person. No deviation shall be made from this scheme without the express written agreement of the Local Planning Authority.

Reason Details are required prior to the commencement of the development to minimise and prevent pollution of the land and the water environment in accordance with Policy EQ1 of the East Herts District Plan 2018.

3 Site Location and National Grid Reference

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

Table 1 Site Detail

Site Address:	Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT
Site assessed under	Site Owners Request - Aid as part of planning and warranties
Current use of land:	Residential House and landscaping
Previous use of site, (if known)	As above
Grid Reference	NGR 535510, 230810
Site Area	0.37 Hectares
Local Authority	East Herts Council
Gradient of the site	The site slopes down to the east. From the eastern boundary there is a steeper slope down onto the farm land off site.
Proximity of Controlled Waters, (if known)	The nearest surface water feature is recorded as 92 meters to the east of the site area, where the Tykes Water is recorded as flowing to the north east.

4 Review of Previous Reports or Documents Relating to the Site

4.1 Site Details

- The site is recorded as an existing residential house with associated landscaping which has been removed of all features and stripped.
- The proposed site construction forms the development of four new private residential houses with associated landscaping and access. Plans have been provided as to the extent of these works in the reporting completed below.
- The site is identified as open land from the earliest map record in 1877 until 1923 when residential land was developed on the site/Additional buildings were added in 1976 which remained in place until present day.
- Surrounding the site, open land is in place. A pond is recorded 50 meters to the south of the site which is infilled in 1976. A farm is located 130 meters to the southeast from the earliest map record until present day. Residential housing is also recorded surrounding the site from 1976 to present.
- The geological profile of the site is identified as a shallow anticipated depth of made ground which in turn overlies Glaciofluvial Deposits. This in turn overlies Lewes Nodular CHALK.
- The nearest surface water feature is recorded as on site which is likely formed by a ditch.
- No groundwater abstraction wells are recorded within the site area up to 1000 meters away.
- The site lies within a Source Zone III Protection Zone. A Source Zone II protection zone is located 999 meters to the north of the site.

4.2 Risks derived from DTS

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

Source Risk

Features On Site

- ***Access road & Parking – Ruled out as a risk***

Features Off Site

- ***Infilled Pond, 50m, S – Ruled out as a risk***

5 Details of Preparatory Work

Preparatory works had originally 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.
- No Targeted Sampling Identified.
- Spatial sampling around the remainder of the site to provide a general assessment.

Initial Investigation – November 2023

- 9 No Competitor Rig Windowless Sampler borehole sunk to a maximum depth of between 2.00-3.00 meters - Date of Works –November 2023.
- Chemical Sampling and Testing recovered from samples and sent to analytical chemist, (report date 27/03/2022).
- Geotechnical Testing

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 Two. 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

Stratum	*Description*	*Depth, Range (m)*	*Thickness, Range (m)*
MADE GROUND	Loose sandy brown topsoil FILL	0.20 –0.40m	0.20-0.40m
	Compact brown brick rubble FILL (possible old foundation)	1.30m	1.30m
LOWESTOFT FORMATION	Loose brown sandy CLAY with much flint gravel	0.50m	0.50m
	Firm brown slightly silty CLAY	0.90m	0.90m
	Firm dark brown slightly silty CLAY	0.80 –1.20m	0.60 - 0.80m
	Soft to firm brown mottled grey slightly silty CLAY with chalk and flint fragments	3.00m+	0.70 –2.50m
	Firm to stiff brown slightly silty CLAY with chalk fragments	3.00m+	0.80 - 2.20m
Ground Water	One record of a slight seepage at 1.40 meters in WS5 has been identified. To date, no long term monitoring had been completed.		

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 excedance 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: -

Zone 1	*The Site*	*Residential Land Use with Homegrown Produce*

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

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

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

Table 4 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	
EC > 6-8	100	230	530	
EC > 8-10	27	65	150	
EC > 10-12	130	330	760	*S4UL*
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	
EC > 7-8	130	290	660	
EC > 8-10	34	83	190	
EC > 10-12	74	180	380	*S4UL*
EC > 12-16	140	330	660	
EC > 16-21	260	540	930	
EC > 21-35	1100	1500	1700	
EC > 33-44	110	1500	1700	
Aliphatic & Aromatic				
EC > 44-70	1600	1800	1900	*S4UL*

Table 5 *Sampling and Testing Schedule*

Site Details					Sample ID				Testing Suite					
Existing Site Use	Proposed Site Use	Chemical Testing Date	stratum sampled	Depth Of Stratum (m b.g.l)	Sample Location	Sample Depth (m)		Justification	HESI Suite 1	PAH's, (Speciated)	TPH's, (TPHCWG)	Asbestos	Type Of Asbestos Identified	Elevated levels of contamination
Residential dwelling	Residential dwelling	14/11/23	FILL	0.20	WS1	0.10 - 0.15		Spatial coverage				✓	NONE	No elevated levels of contamination
			CLAY	0.80	WS2	0.60 - 0.65		Spatial coverage				✓	NONE	
			FILL	0.40	WS3	0.20 - 0.25		Spatial coverage	✓	✓	✓	✓	NONE	
			FILL	1.30	WS4	1.00 - 1.05		Spatial coverage	✓	✓	✓	✓	NONE	
			FILL	0.40	WS6	0.30 - 0.35		Spatial coverage	✓	✓	✓	✓	NONE	
			CLAY	0.90	WS7	0.20 - 0.25		Spatial coverage				✓	NONE	
			CLAY	0.90	WS8	0.50 - 0.55		Spatial coverage	✓	✓	✓	✓	NONE	
			CLAY	0.80	WS9	0.30 - 0.35		Spatial coverage				✓	NONE	

* Indicates the value which forms the lowest trigger level.
Where PAH's are additionally tested within the VOC List. the highest values have been taken.
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

EXPOSURE LEVELS Absent/ Presents

Based on the information gained, we can confirm the following :-

- *No elevated levels of contamination have been encountered within the site area*

We can confirm that the testing completed was undertaken in line with the proposed targeted risk assessment as proposed within the Desk Top Study.

10.3 Land Gas Risks

In accordance with CLR11, 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.

10.4 Vapour Risks

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. Chemical testing confirms that no vaporous risk are in place within the site area.

10.5 Human Health Source Conclusions

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

Zone 1 - The Site

Risk Factor	*Risks in place*	*Remediation*
Targeted Risks	None	
Spatial Risks	None	
Land Gas Risks	None	
Vapour Risk	None	

10.6 Ground and Surface Water Source

The nearest surface water feature is recorded as on site which is likely formed by a ditch along the northern boundary of the site.

The nearest discharge consent is identified as 337 meters to the south east of the site. This is recorded as Sewage Discharges –Final Treated Effluent.

By examination of the Environment Agency Website, the underlying bedrock is recorded as a Principal Aquifer.

No groundwater abstraction wells are recorded within the site area up to 1000 meters away.

The site lies within a Source Zone III Protection Zone. A Source Zone II protection zone is located 999 meters to the north of the site.

In addition to the above no soils risk are recorded in place within the site area therefore no risk to the ground water is in place.

10.7 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 no elevated levels of contamination have been identified and risk is directly in place to water main pipework is unlikely to be in place. This would suggest that any new water main pipework should be installed using conventional 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: -

New water main pipework can be laid in a conventional 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.

10.8 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.

11 Source Risk Conclusions

HUMAN HEALTH RISK

No elevated levels of contamination are recorded within the site area.

WORKFORCE

The lack of human health risk is in place within the site area, will promote a low risk to any workforce within the areas. ***Appropriate PPE / RPE should be worn.***

GROUNDWATER RISKS

No sources of risk are recorded in place within the site area - ***risks to groundwater is not in place.***

VAPOUR RISKS

Chemical testing of the soils show that no risks are in place. ***Vapour risk is not in place.***

GAS RISKS

No sources of land gas risk are recorded in place.

CONSTRUCTION MATERIALS

Construction materials have been considered and no risk has been identified directly to any water main pipework developed at the site.

- ***Water main pipework can be laid in a conventional 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

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.

Maintain a watching brief as follows:-

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

HESI
Herts & Essex Site Investigations

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Geotechnical Assessments | Environmental Assessments | Desktop Studies | Contamination Analysis

Appendix No	A
Sheet No	1
Job No	18610
Date	Nov 2023

Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT

Site Conceptual Model - Proposed SIte Plan

Potential Pathways

Human Heath

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

Flora

9. Plant uptake & direct contact with soil

Controlled Surface Water, Ground Water & Abstraction Well

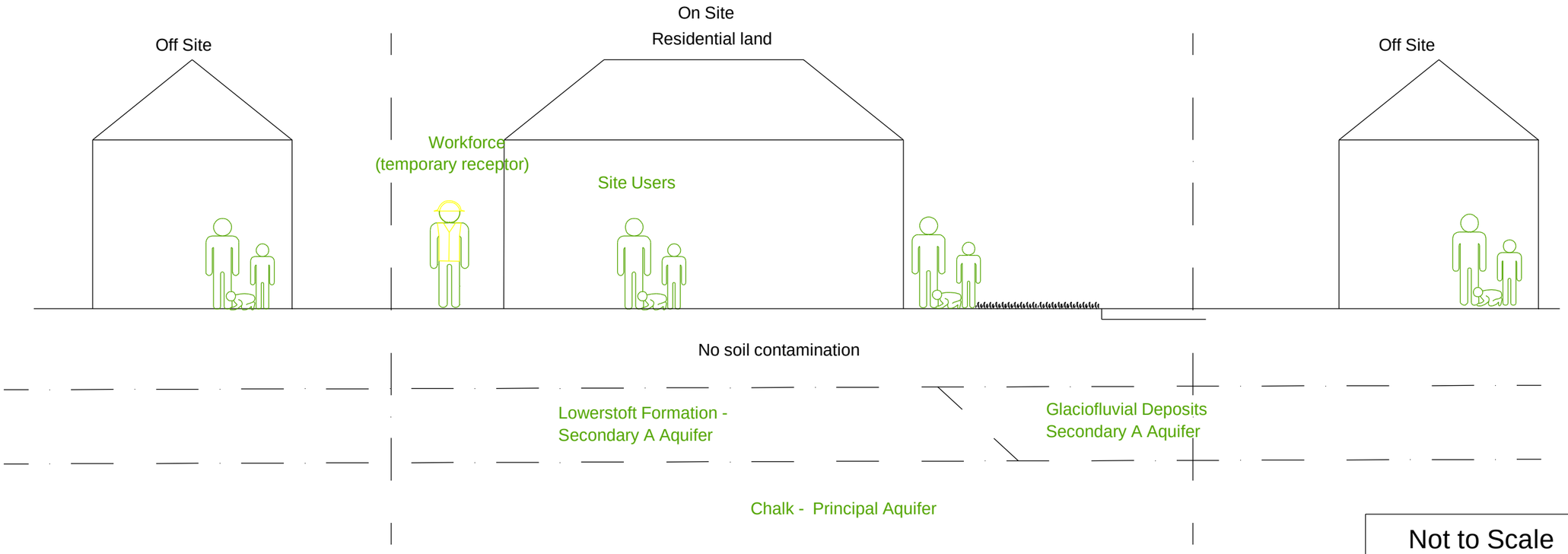
10. Leaching, lateral migration of shallow groundwater to a target receptor

Off Site Sources

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

Key

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



Not to Scale
Sketch No. : ENV / 18610 / A / 01

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Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT

Location Plan

N

The Site

Not to Scale
Sketch No. : ENV / 18610 / 01 / 01

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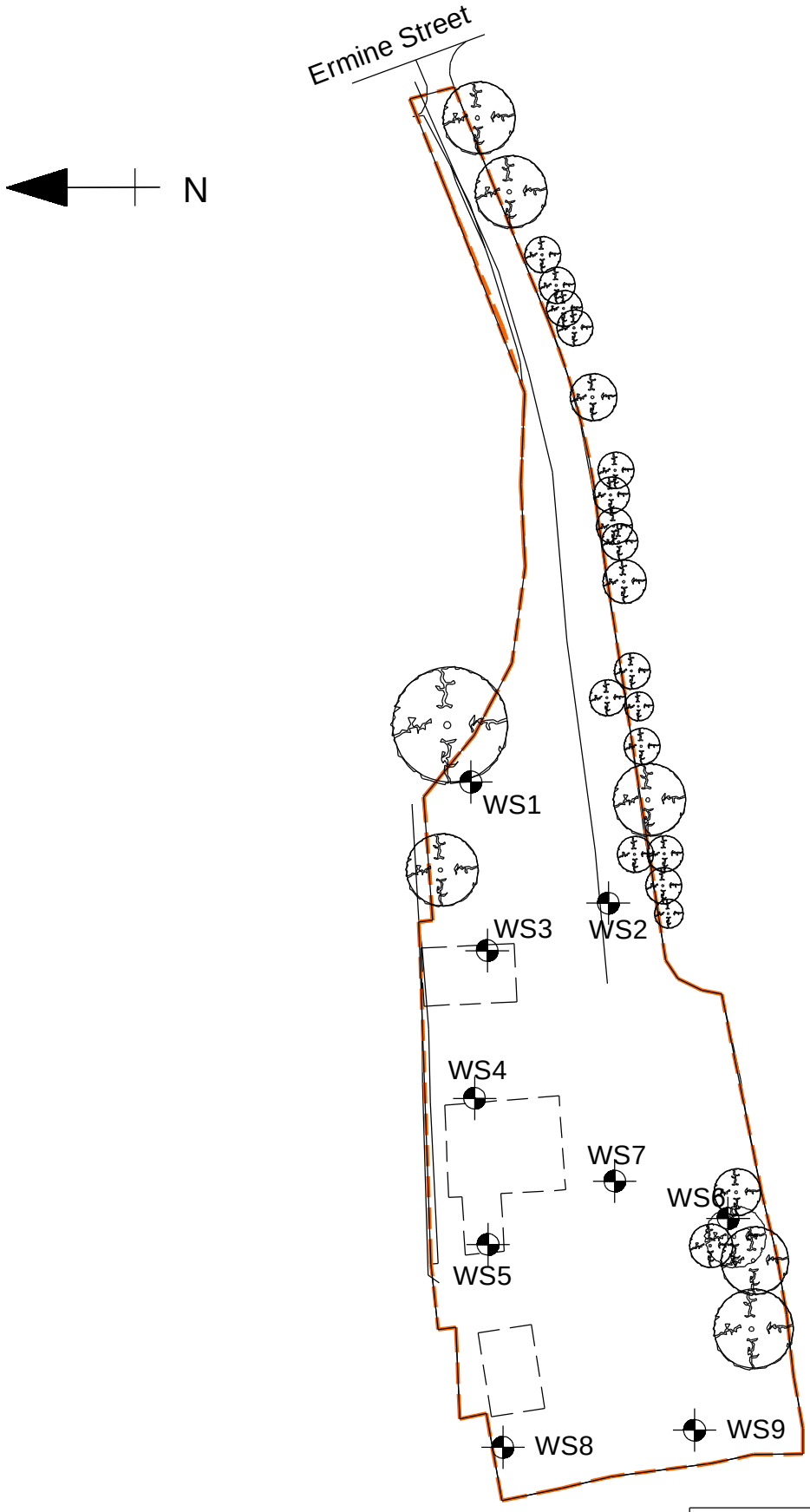
Existing Site Plan



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Sketch No. : ENV / 18610 / 01 / 02

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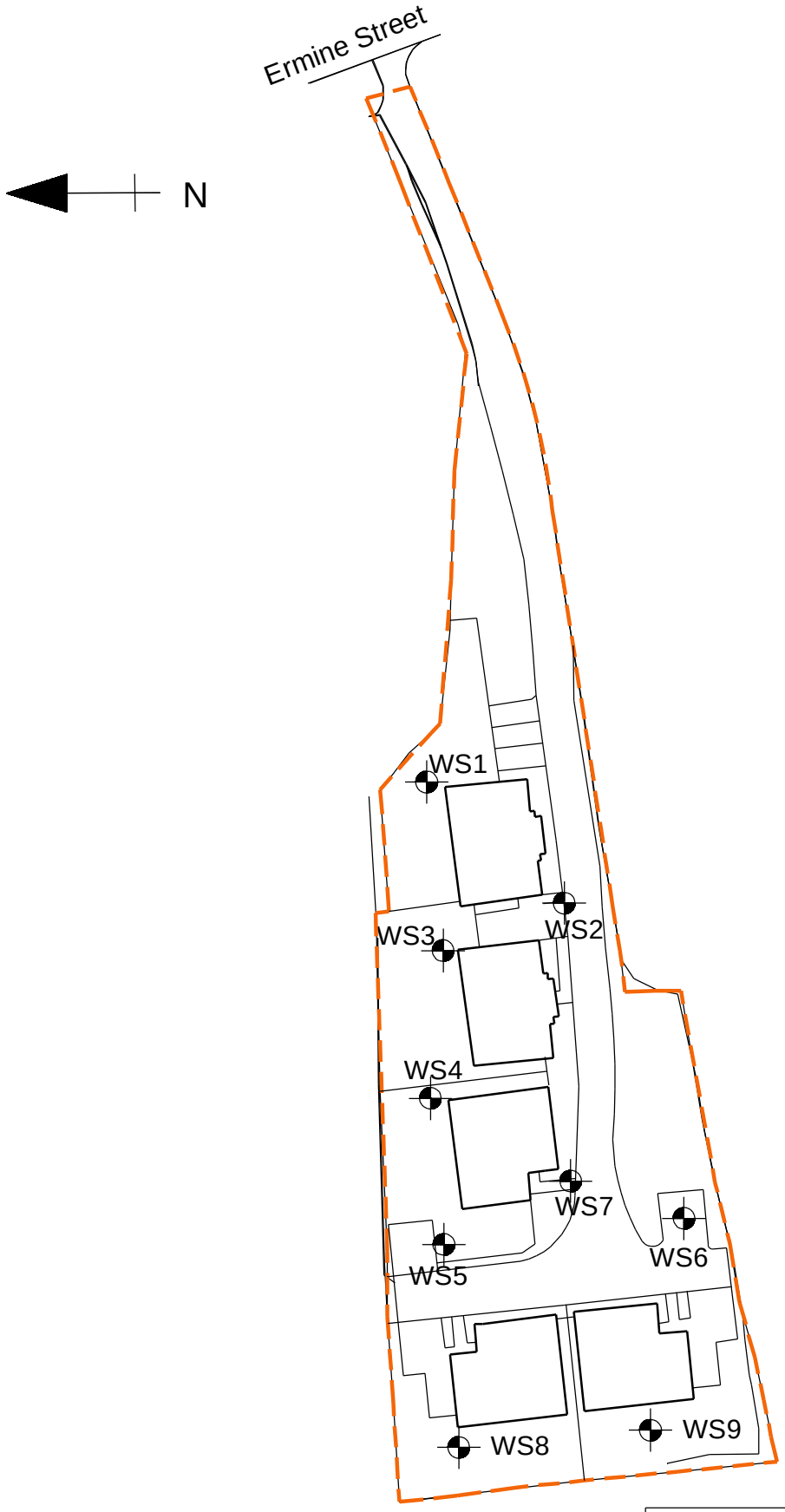
Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT

Proposed Site Plan



Not to Scale

Sketch No. : ENV / 18610 / 01 / 03

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Appendix No 2
Sheet No 1
Job No 18610
Date Nov 2023

Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT

Window Sample One

Description Of Stratum	Legend	Depth (m)	Level (m)	Samples No	Type	Depth (m)	Field Strength	Lab Strength	Water	Backfill
Loose sandy brown topsoil FILL		0.20	0.20	1	U	GL - 1.00				
Loose brown sandy CLAY with much flint gravel		0.50	0.50							
Soft to firm brown slightly silty CLAY with chalk and flint fragments				2	U	1.00-2.00				1.00
			2.50	3	U	2.00 - 3.00				
Borehole Complete at 3.00m Roots to 1.00m		3.00								

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.m²)

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Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT

Window Sample Two

Description Of Stratum	Legend	Depth (m)	Thickness	Samples No	Type	Depth (m)	Strength			
Firm dark brown slightly silty CLAY			0.80	1	U	GL - 1.00				
		0.80								
Soft to firm brown mottled grey slightly silty CLAY with chalk and flint fragments			1.20	2	U	1.00-2.00				1.00
		2.00								
Borehole Complete at 2.00m Roots to close										

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.m²)

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Appendix No 2
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Job No 18610
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Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT

Window Sample Three

Description Of Stratum	Legend	Depth (m)	Thickness	Samples No	Type	Depth (m)	Strength			
Loose sandy brown topsoil FILL		0.40	0.40	1	U	GL - 1.00				
Soft to firm dark brown slightly CLAY		1.00	0.60							
Firm to stiff brown slightly silty CLAY with chalk fragments		2.00	1.00	2	U	1.00-2.00				1.00
			2.00	3	U	2.00 - 3.00				
Borehole Complete at 3.00m Roots to 0.80m		3.00								

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.m²)

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Window Sample Four

Description Of Stratum	Legend	Depth (m)	Thickness	Samples No	Type	Depth (m)	Strength			
Compact brown brick rubble FILL (possible old foundation)		1.30	1.30	1	U	GL - 1.00				
				2	U	1.00-2.00	N=4			1.00
Soft brown clay with chalk fragments		2.00	0.70							
Borehole Complete at 2.00m Roots to 0.70n										

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.m²)

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Appendix No 2
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Job No 18610
Date Nov 2023

Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT [redacted]

Window Sample Five [redacted]

Depth scale	Description Of Stratum	[redacted]	[redacted]	[redacted]	[redacted]	Samples No	[redacted]	Depth (m)	[redacted] Strength	[redacted]	[redacted]	[redacted]
	Soft dark brown slighty silty CLAY					1	U	GL - 1.00				
				1.20								
1.0						2	U	1.00- 2.00	N=5			1.00
			1.20									
	Firm brown slightly silty CLAY with chalk fragments											
					▼ 1.40							
2.0						3	U	2.00 - 3.00	N=16			
				1.80								
3.0	Borehole Complete at 3.00m Roots to 1.40m		3.00					3.00	N=19			

Remarks

Key : U - Undisturbed Sample (100mm diameter) | B - Bulk Sample | D - Disturbed Sample | W - Water Sample | N - SPT N-Value
▼ - Water Struck | ▽ - Water Standing | T - Chemical Tub | V - Vane Test, (kN.m²)

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Appendix No 2
Sheet No 6
Job No 18610
Date Nov 2023

Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT

Window Sample Six

Description Of Stratum	Legend	Depth (m)	Thickness	Samples No	Samples Type	Samples Depth (m)	In-situ Test Strength			Water Strike
Loose sandy brown topsoil FILL		0.40	0.40	1	U	GL - 1.00				
FIrm brown slightly silty CLAY		0.90	0.50							
Firm to stiff brown slightly silty CLAY with chalk fragments			2.10	2	U	1.00-2.00				1.00
				3	U	2.00 - 3.00				
Borehole Complete at 3.00m No roots encountered		3.00								

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.m²)

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Appendix No 2
Sheet No 7
Job No 18610
Date Nov 2023

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Window Sample Seven

Description Of Stratum				Samples No		Depth (m)	Strength			
Soft dark brown CLAY		0.90	0.90	1	U	GL - 1.00				
Firm to stiff brown slightly silty CLAY with chalk fragments		2.00	1.10	2	U	1.00-2.00				1.00
Borehole Complete at 2.00m Roots to close										

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.m²)

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Job No 18610
Date Nov 2023

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Window Sample Eight

Description Of Stratum	Depth (m)	Samples No		Depth (m)	Strength			
Soft dark brown CLAY	0.90	1	U	GL - 1.00				
Soft brown grey clay with chalk fragments	2.10	2	U	1.00-2.00				1.00
		3	U	2.00 - 3.00				
Borehole Complete at 3.00m No roots encountered	3.00							

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.m²)

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Window Sample Nine

Description Of Stratum	Legend	Depth (m)	Samples No		Depth (m)	Strength			
Soft dark brown CLAY		0.80	1	U	GL - 1.00				
Firm to stiff brown slightly silty CLAY with chalk fragments		1.20	2	U	1.00-2.00				1.00
Borehole Complete at 3.00m Roots to 0.80m		3.00	3	U	2.00 - 3.00				

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.m²)

Sampling Chain of Custody (CoC)

eurofins | Chemtest

Please note that any testing scheduled where a matrix option is not selected may be subject to Non-Conformance.
Failure to complete all sections of this form may delay analysis.

Required Information

Company Name:	Herts and Essex Site Investigations
Company Address:	Unit J8, Peek Business Park, Woodside, Bishop's Stortford CM23 5RG
Site Location:	Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT -
Project Reference:	18610
PO Number:	As above
Quote Number:	
Project Contact Name(s)	Chris Gray
Project Contact Email(s)	[redacted]
Main Contact:	Chris Gray
Secondary Contact:	Rebecca Chamberlain

Lab Contact Information

Delivery Information:	Eurofins Chemtest Ltd 12 Depot Road Newmarket. CB8 0AL
Contact Information:	Phone: 01638 606070 Email: cs.team@chemtest.com Web: www.chemtest.com

Water Matrix Codes

Ground Water (**GW**)	Treated Sewage (**TS**)	Soils (**S**)
Surface Water (**SW**)	Trade Effluent (**TE**)	Gas (**G**)
Drinking Water (**DW**)	Saline Water (**SA**)	Product (**P**)
Land Leachate (**LE**)	Process Water (**PR**)	Sludge (**SL**)
Prepared Leachate (**PL**)	Recreational Water (**RE**)	Unspecified Solid (**UNS**)
Untreated Sewage (**US**)	Unspecified Liquid (**UNL**)	

Other Codes

Type of Analysis

Suite / Determinand

HESI Suite 1 | TPHs (CWG) | Asbestos (+ quant if found)

Sample Information

PLEASE DETAIL BELOW ANY POTENTIAL HAZARDS THAT MAY BE ASSOCIATED WITH THESE SAMPLES
example; Anthrax, Radioactive, Explosives

ANALYSIS REQUIRED (please tick appropriately)

Sample Date	Sample Time	Location	AGS Type	Sample Ref	Sample ID	Top Depth	Bottom Depth	MATRIX CODE	Container Type (see key below)	HESI Suite 1	TPHs (CWG)	Asbestos (+ quant if found)
SAMP_DATE	SAMP_TIME	LOCA_ID	SAMP_TYPE	SAMP_REF	SAMP_ID	SAMP_TOP	SAMP_BASE					
14/11/2023		WS1				0.10		S	PT			X
14/11/2023		WS2				0.60		S	PT			X
14/11/2023		WS3				0.20		S	PT / AJ250	X	X	X
14/11/2023		WS4				1.00		S	PT / AJ250	X	X	X
14/11/2023		WS6				0.30		S	PT / AJ250	X	X	X
14/11/2023		WS7				0.20		S	PT			X
14/11/2023		WS8				0.5		S	PT / AJ250	X	X	X
14/11/2023		WS9				0.3		S	PT			X

Client's signature:

Date of Collection

Container Key:

PB - 1L Plastic Bottle	V - 40ml Vial
AB - 1L Winchester	PT - Plastic Tub
AJ - 60/250 Amber Jar	TT - Tenax Tube

Lab Use Only

Consignment Condition:	Received by:
Arriving Temperature:	Date and time:

Turnaround Time Agreed:

3	5	7	10
WAC 5	WAC 7	Other:	

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-38156-1
Initial Date of Issue:	23-Nov-2023
Re-Issue Details:	
Client	Herts & Essex Site Investigations
Client Address:	Unit J8 Peek Business Park Woodside Bishops Stortford Hertfordshire CM23 5RG
Contact(s):	Ben McCullock Chris Gray Dafydd Hudd Rebecca Chamberlain
Project	18610 Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT

Quotation No.:		**Date Received:**	16-Nov-2023
Order No.:	18610	**Date Instructed:**	16-Nov-2023
No. of Samples:	8		
Turnaround (Wkdays):	5	**Results Due:**	22-Nov-2023
Date Approved:	23-Nov-2023		

Approved By:

[redacted]

Details: Stuart Henderson, Technical Manager

Results - Soil

Project: 18610 Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT

Client: Herts & Essex Site Investigations			**Chemtest Job No.:**		23-38156	23-38156	23-38156	23-38156	23-38156	23-38156	23-38156	23-38156
Quotation No.:			**Chemtest Sample ID.:**		1731978	1731979	1731980	1731981	1731982	1731983	1731984	1731985
			Sample Location:		WS1	WS2	WS3	WS4	WS6	WS7	WS8	WS9
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.10	0.60	0.20	1.00	0.30	0.20	0.50	0.30
			Date Sampled:		14-Nov-2023	14-Nov-2023	14-Nov-2023	14-Nov-2023	14-Nov-2023	14-Nov-2023	14-Nov-2023	14-Nov-2023
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020			19	17	13		17	
Stones and Removed Materials	N	2030	%	0.020			< 0.020	< 0.020	< 0.020		< 0.020	
Soil Colour	N	2040		N/A			Brown	Brown	Brown		Brown	
Other Material	N	2040		N/A			Roots	Stones	Stones		Stones	
Soil Texture	N	2040		N/A			Sand	Clay	Clay		Clay	
pH at 20C	M	2010		4.0			8.3	8.7	8.5		8.4	
Electrical Conductivity (2:1)	N	2020	µS/cm	1.0			240	200	250		290	
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40			2.5	0.43	1.3		1.2	
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010			< 0.010	< 0.010	< 0.010		< 0.010	
Cyanide (Free)	M	2300	mg/kg	0.50			< 0.50	< 0.50	< 0.50		< 0.50	
Cyanide (Total)	M	2300	mg/kg	0.50			< 0.50	< 0.50	< 0.50		< 0.50	
Sulphate (Total)	U	2430	%	0.010			0.16	0.10	0.033		0.071	
Arsenic	M	2455	mg/kg	0.5			21	15	51		30	
Cadmium	M	2455	mg/kg	0.10			0.45	0.29	0.25		0.36	
Copper	M	2455	mg/kg	0.50			37	100	23		28	
Mercury	M	2455	mg/kg	0.05			0.28	0.22	0.11		0.12	
Nickel	M	2455	mg/kg	0.50			31	34	45		54	
Lead	M	2455	mg/kg	0.50			94	110	27		37	
Zinc	M	2455	mg/kg	0.50			200	150	88		140	
Chromium (Trivalent)	N	2490	mg/kg	1.0			31	35	44		56	
Chromium (Hexavalent)	N	2490	mg/kg	0.50			< 0.50	< 0.50	< 0.50		< 0.50	
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05			< 0.05	< 0.05	< 0.05		< 0.05	
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05			< 0.05	< 0.05	< 0.05		< 0.05	
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05			< 0.05	< 0.05	< 0.05		< 0.05	
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10			< 0.10	< 0.10	< 0.10		< 0.10	
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05			< 0.05	< 0.05	< 0.05		< 0.05	
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25			< 0.25	< 0.25	< 0.25		< 0.25	
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00			3.5	< 2.0	< 2.0		< 2.0	
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00			5.3	2.4	< 1.0		< 1.0	
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00			4.7	< 2.0	< 2.0		< 2.0	
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00			11	< 3.0	< 3.0		< 3.0	
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00			< 10	< 10	< 10		< 10	
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00			25	6.6	< 5.0		< 5.0	
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00			25	< 10	< 10		< 10	

Results - Soil

Project: 18610 Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT

Client: Herts & Essex Site Investigations			Chemtest Job No.:		23-38156	23-38156	23-38156	23-38156	23-38156	23-38156	23-38156	23-38156
Quotation No.:			Chemtest Sample ID.:		1731978	1731979	1731980	1731981	1731982	1731983	1731984	1731985
			Sample Location:		WS1	WS2	WS3	WS4	WS6	WS7	WS8	WS9
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.10	0.60	0.20	1.00	0.30	0.20	0.50	0.30
			Date Sampled:		14-Nov-2023	14-Nov-2023	14-Nov-2023	14-Nov-2023	14-Nov-2023	14-Nov-2023	14-Nov-2023	14-Nov-2023
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05			< 0.05	< 0.05	< 0.05		< 0.05	
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05			< 0.05	< 0.05	< 0.05		< 0.05	
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05			< 0.05	< 0.05	< 0.05		< 0.05	
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25			< 0.25	< 0.25	< 0.25		< 0.25	
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00			< 1.0	< 1.0	< 1.0		< 1.0	
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00			< 1.0	< 1.0	< 1.0		< 1.0	
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00			< 2.0	< 2.0	< 2.0		< 2.0	
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00			82	4.5	2.8		< 2.0	
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00			6.3	< 1.0	< 1.0		< 1.0	
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00			82	< 5.0	< 5.0		< 5.0	
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00			89	< 10	< 10		< 10	
Total VPH >C5-C10	U	2780	mg/kg	0.50			< 0.50	< 0.50	< 0.50		< 0.50	
Total EPH >C10-C35	U	2690	mg/kg	10.00			110	11	< 10		< 10	
Total EPH >C10-C40	N	2690	mg/kg	10.00			110	11	< 10		< 10	
Organic Matter	M	2625	%	0.40			5.9	8.9	0.89		2.1	
Florisil Cleanup	N		-	N/A			Done	Done	Done		Done	
Naphthalene	M	2700	mg/kg	0.10			< 0.10	< 0.10	< 0.10		< 0.10	
Acenaphthylene	M	2700	mg/kg	0.10			< 0.10	< 0.10	< 0.10		< 0.10	
Acenaphthene	M	2700	mg/kg	0.10			< 0.10	< 0.10	< 0.10		< 0.10	
Fluorene	M	2700	mg/kg	0.10			< 0.10	< 0.10	< 0.10		< 0.10	
Phenanthrene	M	2700	mg/kg	0.10			< 0.10	< 0.10	< 0.10		< 0.10	
Anthracene	M	2700	mg/kg	0.10			< 0.10	< 0.10	< 0.10		< 0.10	
Fluoranthene	M	2700	mg/kg	0.10			0.86	0.34	< 0.10		< 0.10	
Pyrene	M	2700	mg/kg	0.10			1.7	0.66	< 0.10		< 0.10	
Benzo[a]anthracene	M	2700	mg/kg	0.10			0.49	< 0.10	< 0.10		< 0.10	
Chrysene	M	2700	mg/kg	0.10			0.56	< 0.10	< 0.10		< 0.10	
Benzo[b]fluoranthene	M	2700	mg/kg	0.10			< 0.10	< 0.10	< 0.10		< 0.10	
Benzo[k]fluoranthene	M	2700	mg/kg	0.10			< 0.10	< 0.10	< 0.10		< 0.10	
Benzo[a]pyrene	M	2700	mg/kg	0.10			< 0.10	< 0.10	< 0.10		< 0.10	
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10			< 0.10	< 0.10	< 0.10		< 0.10	
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10			< 0.10	< 0.10	< 0.10		< 0.10	
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10			< 0.10	< 0.10	< 0.10		< 0.10	
Total Of 16 PAH's	M	2700	mg/kg	2.0			3.6	< 2.0	< 2.0		< 2.0	
Benzene	M	2760	µg/kg	1.0			< 1.0	< 1.0	< 1.0		< 1.0	
Toluene	M	2760	µg/kg	1.0			< 1.0	< 1.0	< 1.0		< 1.0	
Ethylbenzene	M	2760	µg/kg	1.0			< 1.0	< 1.0	< 1.0		< 1.0	
m & p-Xylene	M	2760	µg/kg	1.0			< 1.0	< 1.0	< 1.0		< 1.0	

Results - Soil

Project: 18610 Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT

Client: Herts & Essex Site Investigations			**Chemtest Job No.:**		23-38156	23-38156	23-38156	23-38156	23-38156	23-38156	23-38156	23-38156
Quotation No.:			**Chemtest Sample ID.:**		1731978	1731979	1731980	1731981	1731982	1731983	1731984	1731985
			Sample Location:		WS1	WS2	WS3	WS4	WS6	WS7	WS8	WS9
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.10	0.60	0.20	1.00	0.30	0.20	0.50	0.30
			Date Sampled:		14-Nov-2023	14-Nov-2023	14-Nov-2023	14-Nov-2023	14-Nov-2023	14-Nov-2023	14-Nov-2023	14-Nov-2023
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
o-Xylene	M	2760	µg/kg	1.0			< 1.0	< 1.0	< 1.0		< 1.0	
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0			< 1.0	< 1.0	< 1.0		< 1.0	
Total Phenols	M	2920	mg/kg	0.10			< 0.10	< 0.10	< 0.10		1.3	

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH at 20°C	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com