GROUND ENGiNEERiNG
LIMITED
Newark Road, Pe[redacted]

REPORT ON A GROUND INVESTIGATION

No.31 MAIN STREET

WOODNEWTON

NORTHAMPTONSHIRE

Report Reference 98879

On behalf of:

J. Burrows Smith
31 Main Street
Woodnewton
PE8 5EB

February 2024

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INTRODUCTION

The client, J. Burrows Smith, is proposing to construct a new dwelling on a small plot of land to the rear of No.31 Main Street, Woodnewton, Northamptonshire.

Ground Engineering Limited was instructed by the client, through Paul Bancroft Architects, to carry out a ground investigation, which comprised four window sample boreholes with laboratory testing on recovered samples to check the underlying soil for potential contaminants.

Reference has been given to a desk study, which had been prepared for the client by others in 2021.

This report documents the findings of the investigation and provides an assessment of the risk of contamination affecting the proposed residential development.

LOCATION, TOPOGRAPHY AND GEOLOGY OF THE SITE

The ground investigation comprised a 25m wide and 35m long plot of land located to the south and to the rear of No.31 Main Street, Woodnewton, Northamptonshire as shown in Figure 1.

The site stands, at about 35mOD, on the northern valley side of Willow Brook, which is located about 220m to the south. The site elevation lies close to the foot of the river valley, which stands at about 30mOD, and the land rises to the north, to the top of the hillside at 60mOD some 800m distant. The National Grid Reference at the centre of the site is TL 0350 9432.

The site was accessed via a dirt access road off Main Street and along the western side of No.31. The access road crossed a gravel surfaced yard situated in front of a derelict stone dwelling to the north-east of the site and to the rear of No.31. The southern side of the site was bounded to the south by a grass field with dwellings flanking the western and eastern sides of the site.

Within the north-eastern part of the site there was a 8m wide by 11m long timber single-storey shed/garage and lean-to structure. The rest of the site was covered by rough grass; piles of construction debris, including rubble, bricks and roofing tiles; and some earth mounds along the southern margin.

Whilst no trees were located within the bounds of the site, mature trees were located within the neighbouring properties.

The geological map at 1:50,000 scale, Sheet 171, and online BGS Geoindex, indicate the site to be directly underlain by the solid geology of the Northampton Sand Formation. To the north of the site, the younger overlying Grantham Formation and Lower Lincolnshire Limestone Member form the higher ground. To the south at the foot of the Willow Brook valley there is a ribbon of Alluvium.

SUMMARY OF DESK STUDY

A summary of the findings of a phase 1 desk study (report reference M3520:July 2021) prepared for the client by Sub Surface Midlands Limited is given below:

Between 1886 and 2003 the site remained for the most part as an undeveloped plot, situated between residential properties along the southern side of Main Street. Some small outbuildings were denoted from about 1901 within the south-eastern corner of the site, and the land between the site and Main Street was denoted as Parsons Yard. At some time between 2003 and 2009, the outbuildings within the south-eastern corner were removed, and a timber shed/garage constructed within the north-eastern part of the site. The latter was present at the time of the ground investigation works in February 2024.

Whilst the desk study did not identify any specific past or present industrial uses it did identify potential sources of contamination comprising: any made ground placed across the site; asbestos within piles of construction debris; spillage of oil/petroleum, which could have occurred from motor vehicles parked on the site.

Whilst there were no landfills documented within 250m radius there was a 120 year old infilled pit/quarry (1886-1901) recorded 185m to the north of the site. We believe that, due to its age, there is a low risk of landfill gas emanating from the infilled pit/quarry; however it should be noted that the natural geology beneath the site presents a radon risk such that full radon protection measures would need to be incorporated into the design of new dwellings.

PRELIMINARY RISK ASSESSMENT

Potential sources of contamination present on or beneath the site would relate primarily to; the historical use of the site, the presence of contaminated soil; and the potential presence of soil gas beneath the site.

In order to assess the risks associated with the presence of ground contamination the linkages between the sources and potential receptors to contamination need to be established and evaluated. This is in accordance with the Environmental Protection Act 1990, which provides a statutory definition of Contaminated Land. To fall within this definition it is necessary that, as a result of the condition of the land, substances may be present on or under the land such that

Significant harm is being caused or there is a significant possibility of such harm being caused; or
Pollution of controlled waters is being, or is likely to be, caused

There are three principal factors that are assessed whilst undertaking a qualitative risk assessment for any site. These are the presence of a contamination source, the existence of migration pathways and the presence of a sensitive target(s). It should be noted that it is necessary for each element of source, pathway and target to be present in order for exposure of a human or environmental receptor to occur.

UK Government guidance on the assessment of contaminated land requires risk to human health and the environment to be reviewed using source – pathway – target relationships. If each of these elements is present, the linkage provides a potential risk to the identified targets.

Contaminants or ***potential pollutants*** identified as ***sources*** in relation to the identified previous uses are listed overleaf in Table 1.

Table 1: Identified Potential Contaminant Sources

Contaminant Source	***Comments***
Infilled Ground & Soil Beneath Site	Contamination may be present within any made ground materials spread across or imported on the site.
Fuel/oil Pollution of the Ground	Spillage or leakage could have occurred in the past from parked motor vehicles.
Soil Gas	Potential soil gas generated from any made ground, or infilled pit 185m to north.
Ground Contamination Outside Site Boundary	Ground contamination migrating from adjoining sites.

A ***Pathway*** is defined as one or more routes through which a receptor is being, or could be, exposed to, or affected by, a given contaminant.

Potential ***Target or Receptors*** fall within the categories of Human Health, Water Environment, Flora and Fauna, and Building Materials.

There are a number of possible pathways for the contaminants identified on the site to impact human and/or environmental receptors and these are summarised in Tables 2 and 3.

Table 2: Human Receptors and Pathways

Human Receptor-Mechanism	***Typical Exposure Pathway***
Human Inhalation	Breathing Dust and Fumes Breathing Gas emissions
Human Ingestion	Eating -contaminated soil, for example by small children -produce grown on contaminated soil Ingesting dust or soil on vegetables Drinking contaminated water
Human Contact	Direct skin contact with contamination Direct skin contact with contaminated liquids

Table 3: Water Receptors and Pathways

Receptor-Water Environment	***Typical Exposure Pathway***
The site and immediate surroundings are indicated to be underlain by the solid geology of the Northampton Sand Formation, which is a Secondary A Aquifer	Surface infiltration of atmospheric waters into the soils beneath the site could wash or dissolve potential contaminants and migrate to underlying groundwater. Contamination leads to restriction/prevention of use as a resource, for example, drinking water, and can have secondary impacts on other resources, which depend on it.
Whilst there are no water courses recorded on the site, Willow Brook is located about 220m to the south of the site at an elevation about 5m lower than the site.	Surface infiltration of atmospheric waters into the soils beneath the site could wash or dissolve potential contaminants and laterally migrate. Contamination leads to a restriction/prevention of use: -as drinking water resource -for amenity use Effects on aquatic life

Preliminary Conceptual Model

Assessment of the potential linkage between ground contamination sources, human and environmental receptors have been assessed based on the desk study research documented in the preceding sections of this report.

A generalised preliminary conceptual model is presented below in Table 4.

Table 4: Preliminary Conceptual Model Relative to Residential Development

Receptors	Pathway	Estimated Potential for Linkage with Contaminant Sources			
		Soil Beneath Site	**Fuel/oil Pollution of the Ground**	**Soil Gas Methane & Carbon Dioxide**	**Ground Contamination from Outside Site Boundary**
Human Health – ground/site workers	Ingestion and Inhalation of contaminated Soil, Dust and Vapour	Low likelihood	Low likelihood	Low likelihood	Unlikely
Human Health – users of completed development	Ingestion and Inhalation of contaminated Soil, Dust and Vapour	Low likelihood	Low likelihood	Low likelihood	Unlikely
Water Environment	Migration through ground into surface water or surrounding groundwater	Low likelihood	Low likelihood	Low likelihood	Unlikely
Flora	Vegetation on site growing on contaminated soil	Low likelihood	Low likelihood	Unlikely	Unlikely
Building Materials	Contact with contaminated soil	Low likelihood	Low likelihood	Unlikely	Unlikely

Key to Table 4 **Estimated Potential for Linkage with Contaminant Source**	**Definition**
High likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such an event would take place, and is less likely in the shorter term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

SITE WORK

The site work was carried out on 3 January 2023 and comprised four window sample boreholes (WS1 to WS4) at locations shown in Figure 2.

The exploratory hole records have been produced in accordance with British Standard BS5930:2015+A1:2020 'Code of Practice for Site Investigations' and are given in Appendix 1. The records provide the descriptions and depths of the various strata encountered, samples taken, and the groundwater conditions observed during excavation, boring and on completion.

Service plans were consulted, and a cable avoidance tool (CAT) was used to check for the absence of buried services prior to boring.

Window Sample Boreholes (WS1 to WS4)

The boreholes were started by the excavation, using hand tools, of service inspection pits to a depth of 1.20m in order to ensure the absence of buried services. Representative small disturbed samples of soil were taken from each starter pit.

The window sample boreholes were formed by a small track-mounted window sampling and super heavy dynamic probing rig and taken to depths of between 2.85m and 3.45m. The window sampling equipment consisted of drive-in sample tubes of specially constructed and strengthened steel, lined with a plastic core-liner. The barrels were initially of 87mm internal diameter and were reduced in diameter with successive barrels with increasing depth. Upon extraction, a continuous 'undisturbed' profile of the soil was obtained within the plastic liners.

The standard penetration test (SPT) was carried out at selected locations in order allow the assessment of the relative in-situ density or stiffness of the ground. The test was made by driving a split-barrel sampler (SPT(S)) into the soils at the base of the borehole by means of an automatic trip hammer weighing 63.50kg falling freely through 750mm. In coarse soils the split-barrel sampler was replaced with a 60^{o} apex cone (SPT(C)). The penetration resistance was determined as the number of blows required to drive the tool the final 300mm of a total penetration of 450mm into the soil ahead of the borehole.

On completion a soil gas and groundwater monitoring installation was fitted into boreholes WS2 and WS4 to a depth of 3.00m and 2.70m respectively. The installations comprised a 50mm diameter standpipe fitted with a silica gravel surround to a depth of 1.00m. A bentonite seal was inserted between 0.50m and 1.00m depth, above which the tube was sealed by a gas valve and a surface protective cover was fixed in concrete. Boreholes WS1 to WS3 were backfilled with silica gravel.

Return Visits to Site

Three return visits to site were undertaken on 26 January 2024; and 2 and 9 February 2024 to monitor the standpipe installations (WS2 and WS4) for depth to groundwater and the concentrations of methane, carbon dioxide and oxygen in the soil gas. Measurement was carried out using a Gasdata GFM430, which also recorded the atmospheric pressure and flow rate. The monitoring results are presented on and following the borehole records in Appendix 1.

CHEMICAL LABORATORY TESTING

Selected soil samples were submitted to a UKAS Accredited Laboratory who carried out a suite of tests, which encompassed a wide range of potential contaminants outlined by the Environment Agency (EA) and National House Building Council (NHBC) document R&D 66; 2008 'Guidance for the Safe Development of Housing on Land Affected by Contamination'.

Tests were carried out to screen the samples for the following potential contaminants: total arsenic, total cadmium, total chromium, hexavalent chromium, total lead, total mercury, total selenium, water soluble boron, total copper, total nickel, total zinc, total cyanides, free cyanides, soluble sulphate, sulphides and pH-value, phenols and polyaromatic hydrocarbons (PAH), including benzo[a]pyrene, petroleum hydrocarbons (TPH) and asbestos.

The results of chemical testing are presented in Appendix 2.

GROUND CONDITIONS

The strata encountered in WS1, WS2 and WS4 comprised a 0.50m to 0.70m thickness of made ground, which rested on the weathered solid geology of the Northampton Sand Formation. Borehole WS3 encountered in excess of 3.45m thickness of made ground and we have subsequently learned that the borehole was located at the position of an old trial pit excavated by the client.

Made Ground

The made ground, which was typically 0.50m to 0.70m thick, was encountered to at least 3.45m depth in WS3. The made ground comprised mixtures of soft, dark brown and brown, slightly sandy, slightly gravelly, silty clay; soft, dark brown, sandy silt; and loose, brown and dark brown, clayey, sandy gravel. The gravel fraction within WS2 to WS4 comprised angular ferruginous sandstone with occasional pottery fragments. The upper 0.70m thick surface layer in WS1 contained fragments of brick, tile, pottery, ash and bone in addition to ferruginous sandstone.

Borehole WS3 was completed at a depth of 3.45m within made ground infilling an old excavation.

Northampton Sand Formation

The Northampton Sand Formation was encountered, below the made ground, at depths of 0.50m to 0.70m in boreholes WS1, WS2 and WS4. It was not encountered in borehole WS3, which was completed in made ground (with a thickness exceeding 3.45m), as discussed in the previous section.

The Northampton Sand Formation initially comprised soft and firm, brown and orange brown layers of slightly sandy, slightly gravelly, silty clay; and slightly sandy, gravelly clay, with localised layers of clayey sand and gravel. At respective depths of 2.65m and 1.70m boreholes WS2 and WS4 passed into a layered sequence of medium dense and dense, brown, orange brown and red brown, ferruginous sand with gravel and cobbles/corestones of ferruginous sandstone.

At a depth of 2.70m, boreholes WS1 and WS4 passed into very weak, friable, brown, orange brown and red brown, ferruginous, sandstone. These boreholes were abandoned at depths of 2.93m and 2.85m in weathered sandstone/corestones within the Northampton Sand Formation.

Borehole WS2 was completed at a depth of 3.45m in medium dense sand of the Northampton Sand Formation.

Groundwater

No groundwater was encountered in boreholes WS1 to WS4, which were dry on completion at depths between 2.85m and 3.45m.

Three return monitoring visits between 26 January and 9 February 2024 found the 3.00m and 2.70m deep standpipes in WS2 and WS4 to be dry.

Evidence of Contamination.

Apart from the presence of ash, no visual or olfactory evidence of contamination or oil pollution was observed in the recovered soil samples.

COMMENTS ON SOIL CHEMICAL TESTING

The results of the laboratory chemical testing on near surface soil samples have primarily been compared to soil screening values (SSVs) produced by Land Quality Management Limited (LQM) and the Chartered Institute for Environmental Health (CIEH) presented in their document 'The LQM/CIEH S4ULs for Human Health Risk Assessment: 2015 (Publication Number S4UL3608)'. The LQM/CIEH S4ULs are intended for use in assessing the potential risks posed to human health by contaminants in soil and are transparently-derived and cautious 'trigger values' above which further assessment of the risks or remedial action may be needed. The S4ULs (Suitable for Use Levels) have been derived, in accordance with UK legislation and Environment Agency policy, using a modified version of the Environment Agency CLEA 1.06 software.

Reference has also been given to AGAC soil screening values produced by Society of Brownfield Risk Assessment (SoBRA) as documented in their July 2020 publication 'Development of Acute Generic Assessment Criteria for Assessing Risks to Human Health from Contaminants in Soil'. With the absence of a S4UL for cyanide, the SoBRA AGAC has been used as the soil screening criteria within this report because the acute dose toxicity thresholds for free cyanide are very close to the chronic dose toxicity thresholds.

In 2014 the Department for Environment Food and Rural Affairs (DEFRA) published, in their document SP1010, Category 4 Screening Levels (C4SL) for several contaminants including lead. The C4SL represent screening levels below which the land could be considered suitable for a specified use and definitely not contaminated land in respect of those determinands. With the absence of S4UL for lead the C4SL has been used as the soil screening criteria within this report.

For each contaminant the adopted soil screening criteria have been calculated for the following land uses:

Residential use with home grown produce
Residential use without home grown produce
Commercial use

The intended purpose of the SSVs are as "intervention values" in the regulatory framework for assessment of human health risks in relation to land use. These values are not binding standards but are intended to inform judgements about the need for action to ensure that a new use of land does not pose any unacceptable risks to the health of the intended users.

Tables 5 & 6 compare the test results for the made ground with the SSVs in relation to the specified uses. The number of test results, which exceed these values, are also provided.

Residential use with home grown produce values are considered appropriately conservative soil screening values for the proposed residential development.

Table 5: Comparison of Chemical Test Results for Near Surface Soil with Soil Screening Values (SSV)

Determinand	Number of Samples	Min Value (mg/kg)	Max Value (mg/kg)	Number of Samples Exceeding SSV for:			Measured 95^{th} Percentile (mg/kg)	Soil Screening Values (SSV) (1% SOM)			
				Residential with home grown produce	Residential without home grown produce	Commercial		Assessment Method	Residential with home grown produce (mg/kg)	Residential without home grown produce (mg/kg)	Commercial (mg/kg)
Organic matter	4	3.6%	11%	-	-	-	-	-	-	-	-
Arsenic	4	24	68	1	1	0	-	S4UL	37	40	640
Cadmium	4	0.24	0.95	0	0	0	-	S4UL	11	85	190
Total Chromium	4	43	57	0	0	0	-	S4UL	910	910	8600
Hexavalent Chromium	4	<0.50	<0.50	0	0	0	-	S4UL	6	6	33
Lead	4	58	160	0	0	0	-	C4SL	200	310	2330
Mercury	4	0.35	0.64	0	0	0	-	S4UL	11	15	320
Selenium	4	1.0	1.3	0	0	0	-	S4UL	250	430	12,000
Nickel	4	27	59	0	0	0	-	S4UL	130	180	980
Phenols	4	<0.10	<0.10	0	0	0	-	S4UL	120	440	440
Copper	4	28	120	0	0	0	-	S4UL	2400	7100	68,000
Zinc	4	170	410	0	0	0	-	S4UL	3700	40,000	730,000
Free Cyanide	4	<0.50	<0.50	0	0	0	-	AGAC	24	24	24

Notes

*The concentration of Trivalent Chromium is assumed to be equivalent to the Total Chromium concentration. This is because most naturally occurring chromium is in the trivalent (chromic) state.

S4UL and C4SL for metals were derived using 6% SOM. These values are not sensitive to SOM and would also be applicable for 1% SOM and 2.5% SOM

LQM/CIEH S4ULs 'Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3608. All rights reserved'

AGAC soil screening values produced by Society of Brownfield Risk Assessment (SoBRA) as documented in their July 2020 publication 'Development of Acute Generic Assessment Criteria for Assessing Risks to Human Health from Contaminants in Soil'.

Table 6: Comparison of PAH Chemical Test Results for Near Surface Soil with Soil Screening Values (SSV)

Determinand	Number of Samples	Min Value (mg/kg)	Max Value (mg/kg)	Number of Samples Exceeding SSV for:			Measured 95th Percentile (mg/kg)	Soil Screening Values (SSV) (1% SOM)			
				Residential with home grown produce	Residential without home grown produce	Commercial		Assessment Method	Residential with home grown produce (mg/kg)	Residential without home grown produce (mg/kg)	Commercial (mg/kg)
Acenaphthene	4	<0.10	<0.10	0	0	0	-	S4UL	210	3000	84,000
Acenaphthylene	4	<0.10	<0.10	0	0	0	-	S4UL	170	2900	83,000
Anthracene	4	<0.10	0.51	0	0	0	-	S4UL	2400	3100	520,000
Benzo[a]anthracene	4	<0.10	1.1	0	0	0	-	S4UL	7.2	11	170
Benzo[a]pyrene	4	<0.10	1.3	0	0	0	-	S4UL	2.2	3.2	35
Benzo[b]fluoranthene	4	<0.10	2.6	0	0	0	-	S4UL	2.6	3.9	44
Benzo[g,h,i]perylene	4	<0.10	0.35	0	0	0	-	S4UL	320	360	390
Benzo[k]fluoranthene	4	<0.10	1.3	0	0	0	-	S4UL	77	110	1200
Chrysene	4	<0.10	1.3	0	0	0	-	S4UL	15	30	350
Dibenzo[a,h]anthracene	4	<0.10	0.12	0	0	0	-	S4UL	0.24	0.31	3.5
Fluoranthene	4	<0.10	2.7	0	0	0	-	S4UL	280	1500	23,000
Fluorene	4	<0.10	<0.10	0	0	0	-	S4UL	170	2800	63,000
Indeno[1,2,3-cd]pyrene	4	<0.10	0.50	0	0	0	-	S4UL	27	45	500
Naphthalene	4	<0.10	<0.10	0	0	0	-	S4UL	2.3	2.3	190
Phenanthrene	4	<0.10	1.90	0	0	0	-	S4UL	95	1300	22,000
Pyrene	4	<0.10	2.60	0	0	0	-	S4UL	620	3700	54,000

Notes

Discussion of Results- Soil

Apart from arsenic none of the determinand concentrations exceeded the respective SSVs for residential or commercial usage and no asbestos was identified within the soil samples tested. There was no visual or olfactory evidence of petroleum pollution in the boreholes and the results of chemical analysis of the near surface soil indicated TPH concentrations of less than 10mg/kg.

Three of the four samples tested had arsenic concentrations, which were less than the SSV for residential with home grown produce and residential without home grown produce.

One soil sample (WS1 at 0.30m) had an arsenic concentration of 68mg/kg, which exceeded the residential with home grown produce usage SSV of 37mg/kg and residential without home grown produce SSV of 40mg/kg. This sample comprised soft, dark brown, slightly sandy, slightly gravelly, silty clay and in addition to ferruginous sandstone, contained fragments of brick, tile, pottery, ash and bone.

SOIL GAS

Soil gas and water monitoring of the standpipes in WS2 and WS4 was conducted on 26 January 2024; and 2 and 9 February 2024.

Concentrations of less than 0.1% by volume methane were encountered with carbon dioxide concentrations between less than 0.1% and 0.5% by volume. Normal atmospheric oxygen concentrations of between 20.1% and 21.0% were also measured.

The results indicate a Gas Screening Value (GSV) of 0.0001l/hr for methane and 0.0005l/hr for carbon dioxide.

The results fall into Characteristic Situation 1 as defined by BS8485:2015+A1:2019 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'

UPDATED CONCEPTUAL MODEL

A generalised conceptual model, updated following the intrusive works, monitoring and testing, is presented below in Table 7 and follows the comparison of consequence against probability presented in CIRIA 552.

Table 7: Updated Conceptual Model & Risk Assessment Relative to Construction and Future Development

Source	Pathway	Receptor	Probability of risk being realised	Consequence of risk being realised	Risk Classification
Soil Beneath Site	Ingestion and Inhalation of contaminated Soil, Dust and Vapour	Human Health Groundworkers	Low Likelihood	Mild	Low Risk
		Human Health Site Users if exposed at surface	Low Likelihood	Mild	Low Risk
		Human Health Site Users if present beneath building floor slabs, permanent hardstanding/roads	Unlikely	Mild	Very Low Risk
	Migration through ground into surface water or groundwater	Water Environment	Unlikely	Mild	Very Low Risk
Soil Gas Methane & Carbon Dioxide	Inhalation of Soil Gas	Human Health Groundworkers	Unlikely	Mild	Very Low Risk
		Human Health Site Users	Unlikely	Mild	Very Low Risk
Ground Contamination Outside Site boundary	Ingestion and Inhalation of contaminated Soil, Dust and Vapour	Human Health Groundworkers	Unlikely	Mild	Very Low Risk
		Human Health Site Users	Unlikely	Mild	Very Low Risk
	Migration through ground into surface water or groundwater	Water Environment	Unlikely	Mild	Very Low Risk

Key to Table 7 Risk	Definition
Very High risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, or there is evidence that severe harm to a designated receptor is currently happening. The risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) and remedial works may be necessary in the short term and likely over the long term.
Moderate risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild.
Low risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

COMMENTS ON GROUND CONTAMINATION IN RELATION TO PROPOSED RESIDENTIAL DEVELOPMENT

The ground investigation works have been carried out in advance of proposed construction of a new dwelling.

This investigation may not have revealed the full depth or extent of made ground or contamination on the site and appropriate professional advice should be sought if subsequent site works reveal materials that appear to be contaminated.

Anticipated exposure scenarios relating to the site and future use, in the context of the conceptual model, are discussed as follows.

Asbestos in Buildings and Constructions Debris

It would be recommended that an asbestos survey is conducted assessing the existing building and surface debris prior to any demolition or building works. Suitable precautions, in line with current best practice, should be put in place to protect workers from the effects of asbestos material, during demolition or building works.

Contamination Risk - Near Surface Soil

The made ground was typically 0.50m to 0.70m thick and was locally present in WS3 to at least 3.45m depth. The made ground comprised mixtures of soft, dark brown and brown, slightly sandy, slightly gravelly, silty clay; soft, dark brown, sandy silt; and loose, brown and dark brown, clayey, sandy gravel. The gravel fraction comprised angular ferruginous sandstone and locally contained fragments of brick, tile, pottery, ash and bone. No asbestos was identified within the four made ground samples tested.

Apart from the presence of arsenic in one of the made ground samples tested, none of the determinand concentrations exceeded the respective SSVs for residential or commercial usage.

The made ground sample from WS1 (0.30m) had an elevated arsenic concentration of 68mg/kg, which exceeded the residential with home grown produce usage SSV of 37mg/kg and residential without home grown produce SSV of 40mg/kg. This made ground was characterised by the presence of brick, tile, pottery, ash and bone in addition to ferruginous sandstone.

Soil Gas - Methane and Carbon Dioxide

According to database information, there are no landfills within 250m of the site and the composition of the underlying natural soil would suggest a very low hazard potential. The soil gas monitoring results fall into Characteristic Situation 1 (very low risk) as defined by BS8485:2015+A1:2019 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'.

In conclusion, gas protection measures are not considered necessary in relation to methane and carbon dioxide soil gases.

Soil Gas - Radon

The natural geology beneath the site presents a radon risk indicative that full radon protection measures would be required for new residential development.

Human Health - Construction Workers

No special precautions would be required during the development of the site by workers who may come into contact with the soil during groundworks, providing standard precautions are adopted, which should generally include the procedures given by the Health and Safety Executive (The Blue Book).

For the protection of these workers during groundworks the following is recommended:

a) Limit repeated or prolonged skin contact with soils by wearing gloves with sleeves rolled down.

b) Washing facilities should be made available to groundworkers, so as to minimise the potential for inadvertent ingestion of soil.

c) If any soils are revealed, which are different to those encountered by this ground investigation, the advice of a specialist should be sought in view of classifying the material and ascertaining its risk to groundworkers.

Human Health – Residential Usage

The risk of soil affecting future users when present beneath buildings and permanent areas of hardstanding would be considered to be very low. This is because it would be highly unlikely that the general site users would normally be able to penetrate the building floors and hardstanding, which would be necessary for them to uncover any contaminated soil beneath the site.

In the absence of further testing within new garden areas, the made ground (particularly that containing brick, tile, pottery, ash and bone) should be considered unsuitable for use at the surface within residential garden areas and should be removed and replaced, or covered, with a suitably thick, clean topsoil capping layer.

For front garden areas it would be recommended that the underlying natural ground be exposed, or in deeper areas the made ground should be removed to sufficient depth to enable the placement of a 0.60m clean cover/capping layer.

For rear garden areas it would be recommended that the underlying natural ground be exposed, or in deeper areas the made ground should be removed to sufficient depth to enable the placement of a 1.00m clean cover/capping layer.

All garden/landscaped areas should be inspected prior to final capping to ensure that unsuitable materials have not been inadvertently placed in the garden or landscaped areas during the preceding stages of redevelopment works.

All imported soil should be certified 'clean' fill and should be suitable for use in accordance with UK legislation and Environment Agency policy.

Off-Site Disposal of Soil Arisings

The results of chemical analysis are provided in Appendix 2 and can be used within the suite of information necessary for basic characterisation of the soil destined for landfill. Excavated material and excess spoil should always be classified prior to removal from site as required by 'Duty of Care' (Environmental Protection Act, 1990) legislation. This means that material has to be given a proper description and waste classification prior to removal. Basic characterisation is the responsibility of the waste producer and compliance checking and on-site verification are generally the responsibility of the landfill operator. The landfill operator will need to liaise with the waste producer as the approach relies on the information from basic characterisation.

The clean arisings from the underlying natural soils, excluding peat and topsoil, across this site should fall under the EWC code 17 05 04 inert category.

GROUND ENGINEERING LIMITED

J. H. GIBB
B.Sc. (Hons.), M.Sc. (Eng.), C.Geol., F.G.S.
Associate

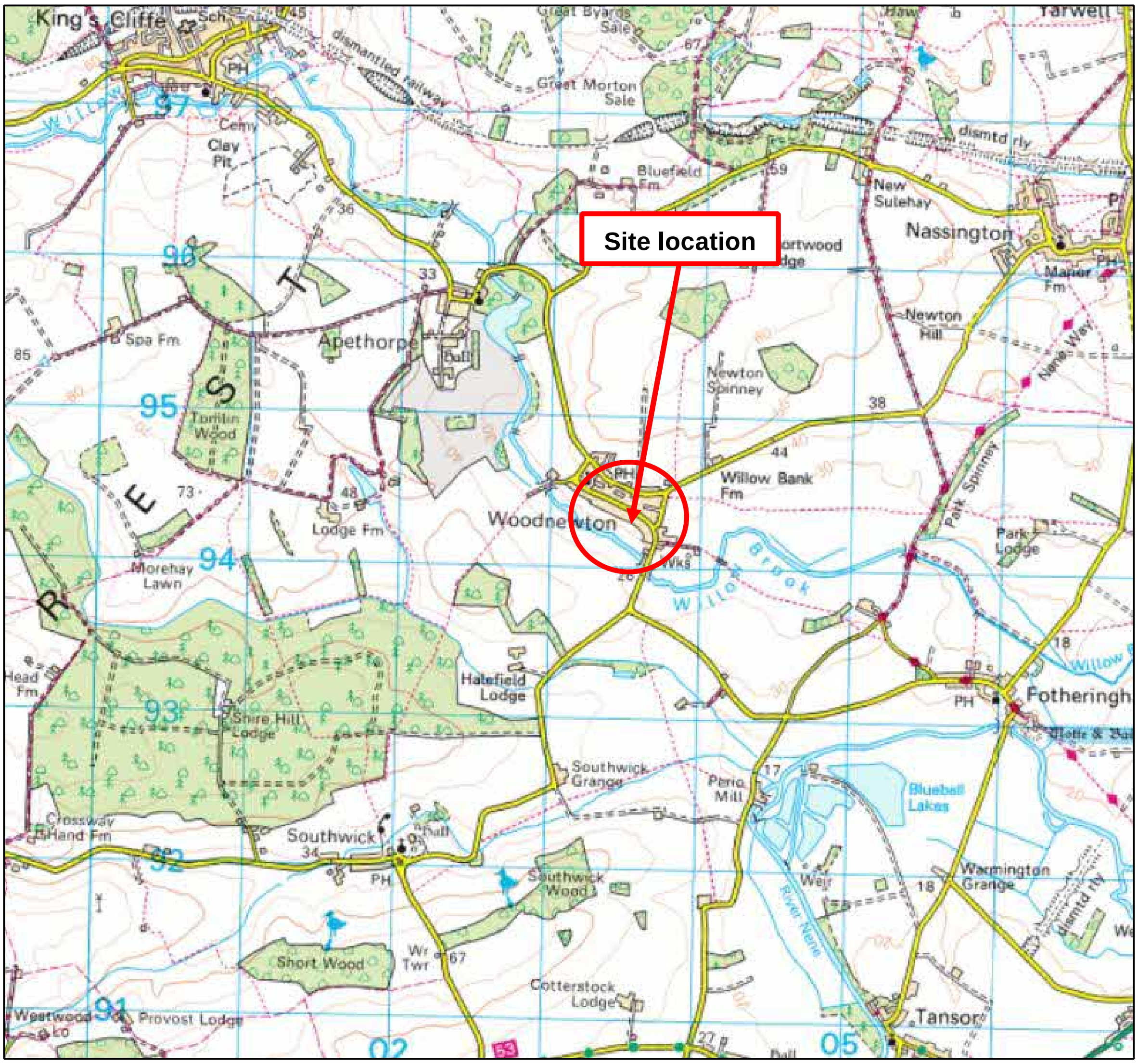
S. J. FLEMING
M.Sc., M.C.S.M., C.Geol., F.G.S.
Director

Figures

Figure 1: Site Location Plan

Figure 2: Borehole Location Plan

[redacted]



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KEY

Boreholes WS1 to WS4

Scale

25m

[redacted]

Appendix 1

Records of Boreholes WS1 to WS4

GROUND ENGiNEERiNG LIMITED
Tel: 01733-566566
www.groundengineering.co.uk

Site: 31 MAIN STREET, WOODNEWTON

WINDOW SAMPLE WS1

Date: 03/01/24

Hole Size: 77mm dia to 2.00m
57mm dia to 2.93m

Ground Level:

Depth m	Type	Result	(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
0.30	D1			MADE GROUND - Soft, dark brown, slightly sandy, slightly gravelly, silty CLAY. Gravel of angular ferruginous sandstone, ash, wood and tile.		0.40	
0.60	D2			MADE GROUND - Soft, brown, slightly sandy, slightly gravelly, silty CLAY. Gravel of angular brick and bone.		0.70	
0.90 1.10 1.20 1.20-2.00 1.35-1.65 2.00 2.00-2.70 2.15-2.45	D3 D4 D5 U1 S D6 U2 S	 N6 N7		Soft, brown and orange brown, slightly gravelly, sandy CLAY. Gravel of angular ferruginous sandstone. (NORTHAMPTON SAND FORMATION)		2.70	
2.70 2.85-2.93	D7 S	 50*		Very weak, friable, brown and orange brown, ferruginous SANDSTONE. (NORTHAMPTON SAND FORMATION)		2.93	
				Hole completed at 2.93m depth			

REMARKS 1. Starter pit excavated from 0.00m to 1.20m depth

Project No 98879

Scale 1:25

Page 1/1

KEY
D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
∇ Water Strike
∇c Depth to Water on completion
J - Jar Sample
MP - Mackintosh Probe
V - Vane Shear Test Cohesion ( ) kPa
P( ) - Hand Penetrometer Cohesion ( ) kPa
∇s Standpipe Level

Groundwater Strikes

No	Struck (Depth m)	Rose to (Depth m)	Rate	Cased	Sealed

Groundwater Observations

Date	Hole (Depth m)	Casing (Depth m)	Water
03/01/24	2.93		dry

GROUND ENGINEERING LIMITED

Tel: 01733-566566
www.groundengineering.co.uk

Site: 31 MAIN STREET, WOODNEWTON

WINDOW SAMPLE WS2

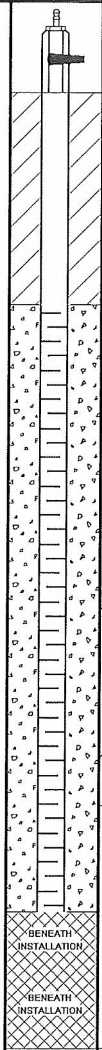
Date: 03/01/24

Hole Size: 87mm dia to 2.00m
67mm dia to 3.45m

Ground Level:

Depth m	Type	Result
0.30	D1	
0.60	D2	
0.90	D3	
1.10	D4	
1.20	D5	
1.20-2.00	U1	
1.35-1.65	S	N11
2.00	D6	
2.00-3.00	U2	
2.15-2.45	S	N10
3.00	D7	
3.15-3.45	S	N14

Inst.



Description of Strata	Depth m	O.D. Level m
MADE GROUND - Dark brown, slightly gravelly, sandy, silty CLAY. Gravel of angular ferruginous sandstone.	0.50	
Firm, brown and orange brown, slightly sandy, slightly gravelly, silty CLAY. Gravel of angular ferruginous sandstone. (NORTHAMPTON SAND FORMATION)	2.00	
Firm, brown and orange brown, slightly sandy, silty CLAY. (NORTHAMPTON SAND FORMATION)	2.50	
Firm, brown and orange brown, slightly sandy, slightly gravelly, silty CLAY. Gravel of angular ferruginous sandstone. (NORTHAMPTON SAND FORMATION)	2.65	
Medium dense, brown and orange brown SAND. (NORTHAMPTON SAND FORMATION)	3.45	

Hole completed at 3.45m depth

REMARKS
1. Starter pit excavated from 0.00m to 1.20m depth
2. Gas monitoring standpipe installed to 3.00m depth

Project No 98879

Scale 1:25

Page 1/1

KEY
D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
▽ Water Strike
▼c Depth to Water on completion
J - Jar Sample
MP - Mackintosh Probe
V - Vane Shear Test Cohesion ( ) kPa
P( ) - Hand Penetrometer Cohesion ( ) kPa
▼s Standpipe Level

Groundwater Strikes

No	Struck	Rose to	Rate	Cased	Sealed

Groundwater Observations

Date	Hole Depth m	Casing Depth m	Water Depth m
03/01/24	3.45		dry
26/01/24	3.00	1.00	dry
02/02/24	3.00	1.00	dry
09/02/24	3.00	1.00	dry

GROUND ENGINEERING LIMITED
Tel: 01733-566566
www.groundengineering.co.uk

Site: 31 MAIN STREET, WOODNEWTON

WINDOW SAMPLE WS3

Date: 03/01/24

Hole Size: 77mm dia to 2.00m
57mm dia to 3.45m

Ground Level:

Samples and in-situ Tests: Depth m	Type	Result	(Date) Water	Description of Strata	Legend	Depth m	O.D. Level m
0.30	D1			MADE GROUND - Soft, dark brown, sandy SILT.		0.40	
0.60	D2			MADE GROUND - Soft, dark brown, slightly sandy, slightly gravelly, silty CLAY. Gravel of angular ferruginous sandstone.		0.70	
0.90	D3			MADE GROUND - Loose, brown and dark brown, clayey SAND AND GRAVEL. Gravel of ferruginous sandstone and occasional pottery fragments.		3.45	
1.10	D4						
1.20	D5						
1.20-2.00	U1						
1.35-1.65	S	N4					
2.00	D6						
2.00-3.00	U2						
2.15-2.45	S	N2					
3.00	D7						
3.15-3.45	S	N1					
				Hole completed at 3.45m depth			

REMARKS 1. Starter pit excavated from 0.00m to 1.20m depth

Project No 98879

Scale 1:25

Page 1/1

KEY
D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
∇ Water Strike
∇c Depth to Water on completion
J - Jar Sample
MP - Mackintosh Probe
V - Vane Shear Test Cohesion ( ) kPa
P( ) - Hand Penetrometer Cohesion ( ) kPa
∇s Standpipe Level

Groundwater Strikes

No	Struck (Depth m)	Rose to	Rate	Cased	Sealed

Groundwater Observations

Date	Hole (Depth m)	Casing	Water
03/01/24	3.45		dry

GROUND ENGiNEERiNG LIMITED
Tel: 01733-566566
www.groundengineering.co.uk

Site: 31 MAIN STREET, WOODNEWTON

WINDOW SAMPLE WS4

Date: 03/01/24

Hole Size: 87mm dia to 2.00m
67mm dia to 2.85m

Ground Level:

Samples and in-situ Tests: Depth m	Type	Result	(Date) Water	Inst.	Description of Strata	Legend	Depth m	O.D. Level m
0.20	D1				MADE GROUND - Soft, dark brown, sandy SILT. Gravel of tile and pottery fragments.		0.20	
0.40	D2				MADE GROUND - Soft, brown, clayey, sandy SILT. Gravel of angular ferruginous sandstone and pottery fragments.		0.50	
0.80	D3				Brown, clayey SAND AND GRAVEL of angular ferruginous sandstone. (NORTHAMPTON SAND FORMATION)		1.00	
1.10 1.20 1.20-2.00 1.35-1.65	D4 D5 U1 S	 N6			Soft, brown, slightly sandy, gravelly CLAY with cobbles of ferruginous sandstone. Gravel of angular ferruginous sandstone. (NORTHAMPTON SAND FORMATION)		1.70	
					Medium dense, orange brown, sandy GRAVEL with cobbles. Gravel and cobbles of angular ferruginous sandstone. (NORTHAMPTON SAND FORMATION)		2.00	
2.00 2.00-2.70 2.15-2.45	D6 U2 S	 N30			Dense, red brown SAND, GRAVEL AND COBBLES of ferruginous sandstone. (NORTHAMPTON SAND FORMATION)		2.70	
2.70 2.85-2.95	D7 S	 50*		BENEATH INSTALLATION	Very weak, friable, red brown, ferruginous SANDSTONE. (NORTHAMPTON SAND FORMATION)		2.85	
					Hole completed at 2.85m depth			

REMARKS
1. Starter pit excavated from 0.00m to 1.20m depth
2. Gas monitoring standpipe installed to 2.70m depth

Project No 98879

Scale 1:25

Page 1/1

KEY
D - Disturbed Sample
B - Bulk Sample
U - Undisturbed Sample
W - Water Sample
▽ Water Strike
▽c Depth to Water on completion
J - Jar Sample
MP - Mackintosh Probe
V - Vane Shear Test Cohesion ( ) kPa
P( ) - Hand Penetrometer Cohesion ( ) kPa
▽s Standpipe Level

Groundwater Strikes

No	Struck (Depth m)	Rose to (Depth m)	Rate	Cased	Sealed

Groundwater Observations

Date	Hole (Depth m)	Casing (Depth m)	Water
03/01/24	2.85		dry
26/01/24	2.70	1.00	dry
02/02/24	2.70	1.00	dry
09/02/24	2.70	1.00	dry

GROUND ENGINEERING LIMITED

Groundwater/Gas Monitoring Record

Site: **Land to Rear of No.31 Main Street, Woodnewton, Northamptonshire**

Report Ref: 98879

Date	Borehole No.	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		Flow Rate (l/hr)	Atmosph. Pressure (mb)	Depth of Well (m bgl)	Depth to Groundwater (m bgl)
		Peak	Steady	Peak	Steady	Min.	Max.				
26/01/24	WS2	<0.1	<0.1	<0.1	<0.1	21.0	21.0	<0.1	1019	3.00	dry
02/02/24	WS2	<0.1	<0.1	0.5	0.5	20.5	20.5	<0.1	1021	3.00	dry
09/02/24	WS2	<0.1	<0.1	0.5	0.5	20.1	20.1	<0.1	970	3.00	dry
26/01/24	WS4	<0.1	<0.1	<0.1	<0.1	20.7	20.7	<0.1	1019	2.70	dry
02/02/24	WS4	<0.1	<0.1	0.5	0.5	20.7	20.7	<0.1	1021	2.70	dry
09/02/24	WS4	<0.1	<0.1	0.3	0.3	20.6	20.6	<0.1	970	2.70	dry

Appendix 2

Laboratory Chemical Test Results

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

Amended Report

Report No.:	24-00334-2		
Initial Date of Issue:	11-Jan-2024	**Date of Re-Issue:**	11-Jan-2024
Re-Issue Details:	This report has been revised and directly supersedes 24-00334-1 in its entirety		
Client	Ground Engineering Limited		
Client Address:	Newark Road Peterborough Cambridgeshire PE1 5UA		
Contact(s):	John Gibb		
Project	Land to rear of 31 Main Street, Woodnewton		
Quotation No.:		**Date Received:**	08-Jan-2024
Order No.:	98879	**Date Instructed:**	08-Jan-2024
No. of Samples:	5		
Turnaround (Wkdays):	5	**Results Due:**	12-Jan-2024
Date Approved:	11-Jan-2024		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Soil

Project: Land to rear of 31 Main Street, Woodnewton

Client: Ground Engineering Limited		Chemtest Job No.:				24-00334	24-00334	24-00334	24-00334	24-00334
Quotation No.:		Chemtest Sample ID.:				1751314	1751315	1751316	1751317	1751318
Order No.: 98879		Client Sample Ref.:				D1	D2	D1	D1	Asb
		Sample Location:				WS1	WS1	WS2	WS3	WS1
		Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):				0.30	0.30	0.30	0.30	
		Date Sampled:				03-Jan-2024	03-Jan-2024	03-Jan-2024	03-Jan-2024	03-Jan-2024
		Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**					
pH at 20C		M	2010		4.0	7.5	7.5	7.6	8.0	
Moisture		N	2030	%	0.020	19	19	14	19	
Stones and Removed Materials		N	2030	%	0.020	< 0.020	< 0.020	< 0.020	< 0.020	
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	1.1	1.8	1.4	1.5	
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	
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	5.9	4.3	3.4	4.0	
Arsenic		M	2455	mg/kg	0.5	68	24	26	25	
Cadmium		M	2455	mg/kg	0.10	0.95	0.39	0.24	0.70	
Chromium		M	2455	mg/kg	0.5	57	43	56	45	
Copper		M	2455	mg/kg	0.50	120	44	28	80	
Mercury		M	2455	mg/kg	0.05	0.37	0.35	0.39	0.64	
Nickel		M	2455	mg/kg	0.50	59	27	31	35	
Lead		M	2455	mg/kg	0.50	130	100	58	160	
Selenium		M	2455	mg/kg	0.25	1.2	1.1	1.0	1.3	
Zinc		M	2455	mg/kg	0.50	410	250	170	410	
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Organic Matter		M	2625	%	0.40	10	7.5	3.6	11	
Acenaphthene		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	
Anthracene		M	2700	mg/kg	0.10	0.51	< 0.10	< 0.10	< 0.10	
Benzo[a]anthracene		M	2700	mg/kg	0.10	1.1	< 0.10	< 0.10	0.60	
Benzo[a]pyrene		M	2700	mg/kg	0.10	1.3	< 0.10	< 0.10	0.75	
Benzo[b]fluoranthene		M	2700	mg/kg	0.10	2.6	< 0.10	< 0.10	1.3	
Benzo[g,h,i]perylene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.35	
Benzo[k]fluoranthene		M	2700	mg/kg	0.10	1.3	< 0.10	< 0.10	0.50	
Chrysene		M	2700	mg/kg	0.10	1.3	< 0.10	< 0.10	1.0	
Dibenz(a,h)Anthracene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.12	
Fluoranthene		M	2700	mg/kg	0.10	2.7	< 0.10	< 0.10	1.4	
Fluorene		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	0.50	
Naphthalene		M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Phenanthrene		M	2700	mg/kg	0.10	1.9	< 0.10	< 0.10	0.59	
Pyrene		M	2700	mg/kg	0.10	2.6	< 0.10	< 0.10	1.6	
Total Of 16 PAH's		M	2700	mg/kg	2.0	15	< 2.0	< 2.0	8.7	
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	
ACM Type		U	2192		N/A	-	-	-	-	-

Results - Soil

Project: Land to rear of 31 Main Street, Woodnewton

Client: Ground Engineering Limited					**Chemtest Job No.:**	24-00334	24-00334	24-00334	24-00334	24-00334
Quotation No.:					**Chemtest Sample ID.:**	1751314	1751315	1751316	1751317	1751318
Order No.: 98879					Client Sample Ref.:	D1	D2	D1	D1	Asb
					Sample Location:	WS1	WS1	WS2	WS3	WS1
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.30	0.30	0.30	0.30	
					Date Sampled:	03-Jan-2024	03-Jan-2024	03-Jan-2024	03-Jan-2024	03-Jan-2024
					Asbestos Lab:	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**					
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Brown	
Other Material		N	2040		N/A	Stones and Roots	Stones and Roots	Stones and Roots	Stones and Roots	
Soil Texture		N	2040		N/A	Loam	Loam	Loam	Loam	
Total TPH >C6-C40		M	2670	mg/kg	10	< 10	< 10	< 10	< 10	

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH at 20°C	pH Meter
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.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
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.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
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)
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