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DATE: FEBRUARY 2025

LAND TO THE REAR OF
19-47 KENYON LANE
MIDDLETON

CONTAMINATED LAND
ASSESSMENT

PREPARED FOR
GR JONES PROPERTY LTD

PROJECT DETAILS

SITE/PROJECT	LAND TO THE REAR OF 19-47 KENYON LANE, MIDDLETON CONTAMINATED LAND ASSESSMENT	
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1. INTRODUCTION

Zig Zag Environmental Ltd has been commissioned by GR Jones Property Ltd to undertake an investigation and to assess the ground conditions at land to the rear of Kenyon Lane, Middleton with respect to potential contamination to satisfy planning conditions.

The site is a roughly rectangular piece of overgrown, derelict land surrounded by houses. It is reported that the land was previously used as allotments with some garages located in the northern section.

Planning permission was granted in April 2023 by Rochdale Borough Council for the 'erection of 8 dwellings with associated parking and landscaping with access from Rose Street and Lily Street' (Planning Ref 22/01223/FUL).

Condition 18 of the permission requires the following:

'No development shall take place until an investigation and risk assessment, in addition to any assessment provided with the planning application, must be completed to assess the nature and extent of any contamination on the site, whether or not it originates on the site. The investigation and risk assessment must be undertaken by competent persons and a written report of the findings must be produced and shall have been first submitted to and approved in writing by the Local Planning Authority before development commences. The report of the findings must include:

- i. a survey of the extent, scale and nature of contamination*
- ii. an assessment of the potential risks to:*
 - human health, property (existing or proposed) including buildings, crops, livestock, pets,*
 - woodland, and service lines and pipes,*
 - adjoining land,*
 - groundwaters and surface waters,*
 - ecological systems,*
 - archaeological sites and ancient monuments;*
- iii. where unacceptable risks are identified, an appraisal of remedial options and proposal of the preferred option(s) The development shall thereafter be carried out in accordance with the approved remediation strategy and a verification report submitted to and approved in writing by the Local Planning Authority before any of the building(s) hereby approved are first occupied.'*

A desk study with walkover survey report was produced for the site by Sub Surface North West Ltd. Sub Surface concluded that 'an intrusive ground investigation is required to assess the ground conditions for contamination'.

Zig Zag Environmental has carried out a trial pit investigation, collecting soil samples for chemical analysis, in support of this assessment of contamination risks. Gas monitoring has not been undertaken at this stage; ZZE has prepared a qualitative assessment of potential gas risks.

In this report ZZE presents a summary of the Sub Surface desk study findings, together with the results of the intrusive investigations, hazardous gas and ground contamination risk assessments and recommendations for remediation and/or mitigation measures, as required.

The conclusions and recommendations presented in this report are the result of our professional interpretation of the information obtained. Zig Zag Environmental reserves the right to amend the conclusions and recommendations if further information becomes available.

2. SITE DESCRIPTION

The site is located to the rear/east of Nos 19 to 47 Kenyon Lane, Middleton, some 1.2 km to the east of Middleton town centre and 7.8 km north of Manchester city centre.

The site is a relatively flat and level area of derelict land that was formerly occupied by allotments and garages. It is currently heavily vegetated and overgrown.

The existing site layout is illustrated on Figure 1, an extract from Whitebox Architecture Drawing No 2693-100 Rev B.



Figure 1 - Site Layout

According to Sub Surface the garages shown in the northern and western parts of the site were removed prior to its walkover survey in January 2023. At Section 1.3 of the desk study report Sub Surface reports that '*general waste (including asbestos cement sheeting) found in the southwest that we understand from the Client is derived from the removal/clearance of the former garages on site*'.

The engineer supervising the trial pit excavations observed asbestos cement panels at the site in the north-east section of the site close to Trial Pit No 2 during the works. The panels were stacked together with some broken pieces, as shown in Figure 2 below.



Figure 2 – Asbestos Cement Panels

The site is surrounded on all sides by residential properties, as illustrated in Figure 1 above.

The development proposals are illustrated on White Box Architecture Drawing No 2693-200 Rev C, presented at Appendix F.

The approved development comprises:

- two blocks of 4 residential dwellings with car parking, front and rear gardens
- two separate accesses one off Rose Street and the second off Lily Street and private roads/cul-de-sacs accessing the individual properties
- areas of landscaping, which appear to be outside of the proposed gardens

ZZE is advised that the buildings foundations will probably be traditional strip footings.

3. DESK STUDY

3.1 INTRODUCTION

As stated previously Sub Surface North West Ltd prepared a Desk Study with Walkover Survey report (Ref 7653) for the site in March 2023, a copy of which was submitted with the planning application for the site.

A summary of the desk study report is provided in the following sections.

3.2 SITE HISTORY

Sub Surface reports that 'at the time of the earliest survey (1848), the site is situated in undeveloped fields. By 1922 the site was divided up into allotment gardens with numerous glasshouses and sheds added over time. By 1968 there are six domestic garages depicted along the western boundary'.

The site has remained like this until present time, although the garages have been removed, although some debris, including asbestos cement panels remain on site.

3.3 GEOLOGY

The geological conditions at the site are reported to comprise glacial till (Boulder Clay) overlying undifferentiated Pennine Lower Coal Measures rocks.

Sub Surface reports 'no made ground indicated to be present. However, as the site has been partially developed, some may be present'.

3.4 HYDROGEOLOGY

Sub Surface reports that:

- *'Superficial deposits are indicated to be a Secondary A aquifer'.*
- *'Bedrock is indicated to be a Secondary A aquifer'.*

Secondary A Aquifers are described as *'permeable layers capable of supporting water supplies at local rather than strategic scale, and in some cases forming an important source of base flow to rivers'.*

- *'The vulnerability of groundwater in the superficial geology to a pollutant found within the site and its immediate surrounding area has been assessed as "Medium" – an area with an intermediate ability to transmit pollution to groundwater'.*

- *'The vulnerability of groundwater in the bedrock geology to a pollutant found within the site and its immediate surrounding area has been assessed as "Low", an area able to provide protection from pollution'.*
- There are no groundwater abstractions within 250 m of the site.
- The site is not within a currently defined groundwater source protection zone.

3.5 HYDROLOGY

Sub Surface reports that:

- *'There are no watercourses (river, stream or canal) within 250 metres of the site boundary.'*
- *'There are no surface water features (ponds or lakes) within 250 metres of the site boundary according to the Ordnance Survey.'*

The site is within the catchment of the River Irk, approximately 350 m to the north of the site. The river flows in a westerly direction at this location.

Wince Brook and the Rochdale Canal are located approximately 500 m to the south-west and 780 m to the east of the site, respectively.

3.6 RADON

Sub Surface reports that *'the site is unlikely to be affected by radon gas as < 1% of surrounding properties are above the Radon Action Level. No radon protection measures are required'.*

3.7 MINING & GROUND STABILITY HAZARDS

Zig Zag Environmental has produced a separate coal mining risk assessment for the site, refer to Report No ZZ24035-1. Potential risks to the development from coal mining are low and no further action is required.

3.8 LAND USE

Sub Surface reports that:

- *'there are no active or recently closed landfill sites within 250 metres of the site boundary'.*
- *there is 'one record of known historical (closed) landfill sites, where there is no PPC permit or current waste management licence, within 250 metres of the site boundary, ... being about 154m to the east of the site boundary' (Morton Pits, Oldham Road, Higher Boarshaw, Middleton).*

- there are 'five unregistered landfills in the form of pits and ponds infilled with unknown material, which may be a source of ground gas, within 250 metres of the site boundary. The old sand pit some 55m to the west is on historic landfill possibly backfilled as late as 1993 to 2005 when it was partially built on and is known to the Local Authority Planning Department, who have concerns with regard to landfill gas migration'.
- there are 'ten records of activities involving the storage, treatment, use or disposal of wastes that are exempt from needing a permit (within specific limits and conditions) within 250 metres of the site boundary, the nearest being the storage of non-agricultural waste in a secure place, about 194 metres to the northeast of the site boundary.'
- 'there are five potentially contaminative industrial land uses identified within 250m of the site boundary, which include two electricity substations (infrastructure and facilities) 82m to the northwest and 185m to the west, homebrewkits.co.uk (consumer products) 128m to the northwest, Middleton Ambulance Station 185m to the west, and a Chimney 230m to the northeast.'
- 'there is one current or recent petrol stations within 250m of the site boundary, which is 215m to the northeast.'
- There are no other specific potentially contaminative land uses or recorded pollution incidents in close proximity to the site.

3.9 INITIAL CONCEPTUAL GROUND MODEL

Sub Surface developed a conceptual ground model for the site, based on the desk study findings. The Sub Surface CSM is summarised in Table 3.1.

Potential Source	Nature of Hazard	Contaminants Associated with the Source	Pathway	Receptor	Preliminary Risk Rating
Made ground (if present on site)	Contaminants in made ground	Gen. Contaminants Arsenic Cadmium Chromium Lead Mercury Molybdenum Nickel Selenium Boron Copper Zinc Cyanide Sulphide Sulphate pH Phenols	Ingestion of soil Ingestion of dust Ingestion of contaminated vegetable produce Dermal contact Inhalation of dust Inhalation of Vapours	Site Operatives End Users	Low

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Potential Source	Nature of Hazard	Contaminants Associated with the Source	Pathway	Receptor	Preliminary Risk Rating
		Polynuclear Aromatic Hydrocarbons Total Petroleum Hydrocarbons	Uptake via contaminated groundwater	Vegetation	Low
			Vertical and lateral movement of mobile contaminants to surface water and groundwater	Controlled Waters	Low
			Direct contact	Structures and Services	Low
Asbestos on/ in ground	Asbestos fibres	Asbestos fibres	Inhalation of fibres	Site Operatives End Users	Moderate
Vehicles (parked in domestic garages, parking spaces and on site)	Fuel/ oil spillage and/or leakage from machinery, fuel/oil tanks and/or vehicles	Total Petroleum Hydrocarbons (TPH) and/ or Benzene/ Toluene/ Ethylbenzene/ Xylene (BTEX) Chlorinated Solvents	Ingestion of soil	Site Operatives End Users	Low
			Ingestion of dust		
			Ingestion of contaminated vegetable produce		
			Dermal contact Inhalation of dust		
			Inhalation of Vapours		
			Uptake via contaminated groundwater	Vegetation	Low
			Vertical and lateral movement of mobile contaminants to surface water and groundwater	Controlled Waters	Low
			Direct contact	Structures and Services	Low
Landfill (unregistered)	Ground Gas (Asphyxiation, fire and explosion)	Methane Carbon Dioxide	Inhalation of gas	Site Operatives End Users	Moderate
			Ignition of gas		

Potential Source	Nature of Hazard	Contaminants Associated with the Source	Pathway	Receptor	Preliminary Risk Rating
Historic allotments and later private gardens	Use of/ spillage/ leachate of Pesticides	Pesticides	Ingestion of soil	Site Operatives End Users	Very Low
			Ingestion of dust		
			Ingestion of contaminated vegetable produce		
			Dermal contact		
			Inhalation of dust	Vegetation	Very Low
			Inhalation of vapours		
			Uptake via contaminated groundwater		
			Vertical and lateral movement of mobile contaminants to surface water and groundwater	Controlled Waters	Very Low
			Direct contact	Structures and Services	Very Low

Table 3.1 - Summary of Sub Surface CSM (excluding mining issues)

Note: ZZE has produced a coal mining risk assessment for the site assessing coal mining related hazards, therefore the mining risks identified by Sub Surface have been removed from the table

Sub Surface reports that *‘the conceptual ground model indicates that an intrusive ground investigation is required to assess the ground conditions.*

4. GROUND INVESTIGATION

Sub Surface recommended that *‘the ground investigation should also obtain soil samples for contamination analysis and asbestos detection and, where possible, groundwater and surface water samples for contamination analysis. In addition, the conceptual ground model indicates that ground gases might be present and hence gas standpipes should be installed and monitored over an extended period of time to allow for an assessment to be made’.*

ZZE has undertaken an intrusive ground investigation at the site to determine the current site conditions and assess risks associated with ground contamination. At this stage no gas monitoring has been undertaken.

4.1 TRIAL PITS

Seven shallow trial pits were excavated across the site to depths of between 1.4 and 1.6 m using a JCB 16/C1 1.5 tonne excavator. Access was restricted by the overgrown nature of the site

Copies of the trial pit records are presented at Appendix A and the trial pit locations are illustrated on Drawing No ZZ24035/01 presented at Appendix F.

It can be seen, from these records, that made ground has been identified at two locations (TP2 in the northern part of the site & TP 5 in the central/western part of the site). The made ground is 0.1 and 0.15 m thick at these locations and comprises topsoil with anthropogenic materials mixed in eg wood, plastic, glass & bricks at Trial Pit No 2 and bricks in soily matrix (possible foundation footing) at Trial Pit No 5.

The made ground is located in areas where garages were sited.

A relatively thick layer of black sandy topsoil is present across the entire site, underlying the made ground where present. Thickness varies between 0.3 & 1.0 m (mean 0.57 m).

The superficial soils consist of silty sand/sandy silt, overlying glacial till (Boulder Clay).

The sand/silt layer, containing occasional clods of clay and fine to coarse gravel, has been located at all trial pit locations to a maximum excavation depth of 1.6 m in Trial Pit Nos 3, 4 & 6.

The underlying weathered glacial clay was only encountered at one location, Trial Pit No 1 in the northern part of the site, although it is believed to underly the entire site.

No groundwater was encountered in any of the trial pits.

4.2 SAMPLING

Soil samples were collected from the trial pits for chemical testing, as follows:

- 2 made ground samples
- 6 topsoil samples
- 3 natural subsoil samples

Sample details are presented on the trial pit records in Appendix A.

Sub Surface recommended that *'the ground investigation should obtain ..., where possible, groundwater and surface water samples for contamination analysis'*.

There is no surface water at the site and groundwater was not encountered in any of the trial pits excavated.

4.3 CHEMICAL TESTING

Eleven samples (2 made ground, 6 topsoil and 3 natural subsoil) have been analysed for a general screening suite of potential contaminants, as follows:

pH

Metals (arsenics, boron, cadmium, chromium, copper, lead, mercury, nickel, selenium & zinc)

Cyanide

Speciated Polynuclear Aromatic Hydrocarbons (PAHs)

Phenol

Soil Organic Matter

Sulphate

Both of the made ground samples and all six topsoil samples were also screened for asbestos and where positive identifications were reported the asbestos present was quantified.

One made ground sample, two topsoil samples and one subsoil sample have been analysed for speciated petroleum hydrocarbons and BTEX compounds.

Two topsoil samples and one subsoil sample have also been tested for volatile and semi-volatile organic compounds (VOCs and SVOCs), to inform a United Utilities risk assessment.

The results of the chemical testing are presented in Appendix B and are summarised in Tables 4.1, 4.2 & 4.3.

4.4 ASSESSMENT OF CHEMICAL TEST RESULTS

Each of the made ground and topsoil samples has been screened for asbestos as recommended by Sub Surface. Positive asbestos detections were reported for both made ground samples and one of the six topsoil samples tested, as follows:

Made Ground

TP2 0.10 m	Amosite	Loose Insulation	0.001%
TP5 0.10 m	Chrysotile	Loose Fibres & Loose Insulation	0.017%

Topsoil

TP1 0.20 m	Amosite	Loose Fibres	<0.001%
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Both amosite and chrysotile asbestos types are associated with asbestos cement materials such as those identified by Sub Surface and evident at the site during the trial pitting.

There are no commonly accepted assessment criteria for asbestos in soils at development sites, as there is for other potential contaminants. For, sensitive land use, eg residential, a precautionary approach is usually adopted by local authorities amounting to zero tolerance to the presence of asbestos fibres.

None of the asbestos concentrations reported exceeds the hazardous waste limit (0.1%).

The results of the contaminant testing are summarised in Tables 4.1, 4.2 and 4.3. ZZE has subdivided the data according to the material type (made ground, topsoil and subsoil) for comparison against the assessment criteria.

Analyte	Units	Range of Results			Assessment Criteria**
		Made Ground	Topsoil	Subsoil	
pH	-	7.47 & 8.10	6.72 – 7.56	6.56 – 7.08	-
Arsenic	mg/kg	18 & 12	15 – 37	<1 – 3	37*
Boron	mg/kg	<1.0 & 3.8	<1.0	<1.0	290
Cadmium	mg/kg	1.4	0.5 – 1.6	<0.5	22*
Copper	mg/kg	322 & 49	43 – 213	8 – 18	2400
Chromium (total)	mg/kg	19 & 12	12 – 57	7 – 15	910
Chromium (vi)	mg/kg	<1	<1	<1	21*
Lead	mg/kg	584 & 156	63 – 848	11 – 40	200*
Mercury	mg/kg	<0.17	<0.17 – 0.71	<0.17	120
Nickel	mg/kg	20 & 18	12 – 44	7 – 16	180
Selenium	mg/kg	<1	<1 – 1	<1	250
Zinc	mg/kg	417 & 206	107 – 632	18 – 154	3700
Organic Matter	%	18 & 12	5.4 – 21.4	0.4 – 1.8	-
Sulphate (Total)	mg/kg	770 & 700	390 – 1200	<200	-
Sulphate (2:1 Ext)	g/l	<0.01 & 0.03	<0.01 – 0.01	<0.01	-
Cyanide	mg/kg	<1	<1 – 1	<1 – 1	-

Table 4.1 - Summary of Inorganic Analysis

Notes to Tables:

* - C4SLs for residential land use with home-grown produce, all other assessment criteria S4ULs for the same land use, produced by LQM/CIEH.

** - Where assessment criteria values are dependent on the soil organic matter the criteria for 6.0 & 1.0 % SOM are specified based on test results for both soil types. Mean SOM results for the made ground, topsoil & subsoil strata are 9.8, 15.8 & 1.2% respectively

PH - Petroleum Hydrocarbons

Analyte	Range of Results (mg/kg)			Assessment Criteria**
	Made Ground	Topsoil	Subsoil	
Phenols	<0.2	<0.2	<0.2	1100/280
Benzene	<0.01	<0.01	<0.01	0.87*
Toluene	0.01	<0.01	<0.01	660/130
Ethylbenzene	0.01	<0.01	<0.01	260/47
mp-Xylene	0.07	<0.01	<0.01	310/56
o-Xylene	0.05	<0.01	<0.01	330/60
MTBE	<0.01	<0.01	<0.01	-
Aliphatic PH (C5-C6)	<0.01	<0.01	<0.01	160/42
Aliphatic PH (C6-C8)	<0.01	<0.01	<0.01	530/100
Aliphatic PH (C8-C10)	<1	<1	<1	150/27
Aliphatic PH (C10-C12)	<1	<1	<1	760/130
Aliphatic PH (C12-C16)	<1	<1 - 3	1	4300/1100
Aliphatic PH (C16-C21)	3	<1 - 4	2	110,000/65,000
Aliphatic PH (C21-C35)	70	<1 - 26	21	
Aromatic PH (C5-C7)	<0.01	<0.01	<0.01	300/70
Aromatic PH (C7-C8)	0.01	<0.01	<0.01	660/130
Aromatic PH (C8-C10)	4	<1 - 3	<1	190/34
Aromatic PH (C10-C12)	3	<1 - 1	<1	380/74
Aromatic PH (C12-C16)	5	<1 - 24	7	660/140
Aromatic PH (C16-C21)	25	<1 - 108	40	930/260
Aromatic PH (C21-C35)	101	1 - 288	149	1700/1100

Table 4.2 - Summary of Organic Analysis

Analyte	Range of Results (mg/kg)			Assessment Criteria *, **
	Made Ground	Topsoil	Subsoil	
Acenaphthene	0.15 & 0.25	<0.01 - 7.87	<0.01 - 0.62	1100/210
Acenaphthylene	0.07	<0.01 - 0.28	<0.01 - 0.08	920/170
Anthracene	0.3 & 0.5	<0.02 - 7.45	<0.02 - 1.06	11,000/2400
Benzo(a)anthracene	1.38 & 1.87	<0.04 - 12.4	<0.04 - 2.85	13/7.2
Benzo(a)pyrene	1.58 & 1.96	<0.04 - 10.6	<0.04 - 2.85	5.0*
Benzo(b)fluoranthene	1.97 & 2.41	<0.05 - 12.3	<0.05 - 3.49	3.7/2.6
Benzo(ghi)perylene	1.00 & 1.18	<0.05 - 5.51	<0.05 - 1.65	350/320
Benzo(k)fluoranthene	0.85 & 0.86	<0.07 - 1.45	<0.07 - 1.45	100/77
Chrysene	1.82 & 2.35	<0.06 - 13.6	<0.06 - 3.45	27/15
Dibenzo(ah)anthracene	0.25 & 0.29	<0.04 - 1.24	<0.04 - 0.40	0.3/0.24
Fluoranthene	3.08 & 4011	<0.08 - 28.4	<0.08 - 6.69	890/280
Fluorene	0.12 & 0.16	<0.01 - 4.84	<0.01 - 0.40	860/170
Indeno(123-cd)pyrene	1.04 & 1.21	<0.03 - 5.82	<0.03 - 1.70	41/27
Naphthalene	0.14 & 0.04	<0.03 - 2.15	<0.03 - 0.54	13/2.3
Phenanthrene	1.53 & 2.21	<0.03 - 34.1	<0.03 - 4.80	440/95
Pyrene	2.67 & 3.73	<0.07 - 24.3	<0.07 - 6.05	2000/620
Total PAH	17.9 & 23.2	<0.08 - 176	<0.08 - 37.1	-

Table 4.3 - Summary of PAH Analysis

Two topsoil samples and one sample of natural subsoil have also been analysed for VOCs and SVOCs.

All VOCs reported are below the test limit of detection in all three samples.

Only PAHs were reported at concentrations above the test limit of detection as part of the SVOC test suite. A full assessment of the USEPA PAHs is summarised at Table 4.3 above from the speciated PAH test results.

It can be seen from the chemical analyses that elevated concentrations of lead and PAHs have been identified at the site, the data is assessed further below.

Lead

Elevated lead concentrations, above the residential assessment criterion have been reported for 1 of the 2 made ground samples (TP1 – topsoil with anthropogenic materials) and 4 of the 6 topsoil samples (TPs 1, 3, 4 & 6), as follows:

Trial Pit	Topsoil Depth	Sample Depth	Lead Concentration
TP 1	0 – 1.0 m	0.20 m	848 mg/kg
TP 3	0 – 0.7 m	0.30 m	233 mg/kg
TP 4	0 – 0.3 m	0.15 m	495 mg/kg
TP 6	0 – 0.4 m	0.15 m	545 mg/kg

Table 4.4 – Elevated Lead in Topsoil

Two of the topsoil results (TP2 – 63 mg/kg & TP5 – 114 mg/kg) were below the assessment criterial concentration (200 mg/kg).

The mean and UCL95 concentrations for lead in the topsoil at the site using the 6 sample results are 383 and 699 mg/kg. These statistical concentrations are both significantly higher than the C4SL limit for residential land use with homegrown produce (200 mg/kg).

The UCL95 concentration for lead in the topsoil stratum (699 mg/kg also exceeds the C4SL limit for public open space close to residential development (630 mg/kg), which might be applicable to the landscaped areas within the wider development site.

Benzo(a)pyrene

An elevated benzo(a)pyrene concentration has been reported for one of the 6 topsoil samples analysed, TP6 (10.6 mg/kg), above the residential assessment criteria (5 mg/kg).

This result would be considered a statistical outlier within the relatively small dataset available.

Benzo(b)fluoranthene

Elevated benzo(b)fluoranthene concentrations have been reported for 2 of the 6 topsoil samples analysed, TP3 (4.52 mg/kg) and TP6 (12.3 mg/kg), above the residential assessment criteria (3.7 mg/kg).

The mean and UCL95 concentrations for benzo(b)fluoranthene in the topsoil are 3.87 and 4.60 mg/kg. These statistical concentrations are both significantly higher than the C4SL limit for residential land use with homegrown produce (3.7 mg/kg).

One of the subsoil samples also returned an elevated concentration (TP3, 1.4 m – 3.49 mg/kg). This sample was collected from the natural soil below the contaminated topsoil sample.

Dibenzo(ah)anthracene

Elevated dibenzo(ah)anthracene concentrations have also been reported for 2 of the 6 topsoil samples analysed, TP3 (0.5 mg/kg) and TP6 (1.24 mg/kg), above the residential assessment criteria (0.3 mg/kg).

The mean and UCL95 concentrations for dibenzo(ah)anthracene in the topsoil are 0.42 and 0.87 mg/kg. These statistical concentrations are both significantly higher than the C4SL limit for residential land use with homegrown produce (0.3 mg/kg).

One of the subsoil samples also returned an elevated concentration (TP3, 1.4 m – 0.4 mg/kg). This sample was collected from the natural soil below the contaminated topsoil sample.

It may be possible to review and update the statistical analysis if further investigations, sampling and analysis is undertaken.

5. LANDFILL GAS RISK ASSESSMENT

5.1 INTRODUCTION

Sub Surface concluded, in the Desk Study report that *‘the conceptual ground model indicates that ground gases might be present and hence gas standpipes should be installed and monitored over an extended period of time to allow for an assessment to be made’*.

ZZE considers that the potential gas risks are relatively low given the potential gas sources identified by Sub Surface and therefore that a pragmatic, qualitative approach could be taken, without the need for gas monitoring.

The potential risks to the site and its future occupants have been assessed using standard risk assessment methodology, ie the source-pathway-receptor principle, recommended in the applicable guidance, refer to the following report sections.

5.2 POTENTIAL SOURCES OF GAS

Sub Surface reported that *'the site is unlikely to be affected by radon gas as < 1% of surrounding properties are above the Radon Action Level. No radon protection measures are required'*.

Groundsure identified one former historical landfill at Morton Pits, Oldham Road, Higher Boarshaw, Middleton, some 154 m to the east of the development site.

Sub Surface also reported that *'our historical appraisal has identified five unregistered landfills in the form of pits and ponds infilled with unknown material, which may be a source of ground gas, within 250 metres of the site boundary'*.

The potential gas sources identified in the Desk Study report, are discussed in the following table:

Potential Source	ZZE Comment
Old Sand Pit 55 m to the west	Sub Surface reports that the pit is illustrated on the 1893 OS map and was used as a football field on the 1909 map. Sub Surface also reports that the old pit is <i>'on historic landfill possibly backfilled as late as 1993 to 2005 when it was partially built on (with houses on Tonge Meadow) and is known to the LPA who have concerns with regard to landfill gas migration'</i>. Landfill licencing was introduced in the mid 1970's and so if this site was a landfill, it would have been licenced/ permitted at that time and other relevant records would exist. If the land was filled as part of the redevelopment of the site this would have been controlled through planning and building control. Review of historic OS maps reveals that following quarrying, a football field occupied the centre of the former pit in 1893. At this time the sand pit perimeter batters were still clearly evident. By 1909 the recreational facilities had been expanded to a football & athletic ground with a bowling green to the east. Some small buildings are also shown. By 1922 houses had been constructed along the eastern part of the former sand pit, adjacent to Kenyon Lane. By 1932 the sports field is labelled as (Tonge) playing field but the bowling green and adjacent club remain, having become a Tennis, Social & Bowling Club by the mid 1950's. Some garages were also constructed in the north-east corner of the former sand pit by this time. The 1972 map shows residential development to the north with additional garages constructed immediately north of an extended social club building. The 2023 map shows the redevelopment of the former sports field for residential use. From Google Earth aerial photographs it can be seen the houses were constructed in around 2005 off Tonge Meadow.

Potential Source	ZZE Comment
	The land to the north of the social club where the garages were located has also been redeveloped for residential use with 4 pairs of semi-detached dwellings. Review of planning portal records has identified a Phase 2 investigation report for the new housing development north of the social club/bowling green, that was originally part of the sand pit (Ref Planning Application 21/00824/DOC. <i>Trial pits were excavated by Adeptus Consulting who reported that the 'near surface soils generally consisted of reworked natural material comprising gravelly sand ... underlain by very soft grey clay (Glacial Till) from 0.3m below ground level. Some pockets of darker material containing ash and clinker were noted'.</i> Adeptus did not recommend gas mitigation measures. ZZE considers that this site has not been infilled it has simply been redeveloped. It does not represent a significant gas risk to the current development being assessed.
Morton Pits (Landfill) 154 m to the east	Review of the historic OS maps indicate large individual ponds on the site with Tonge Colliery to the North (c 1848 – 1966). The ponds were infilled from 1967 onwards and the site was used as a hardstanding to the rear of a garage petrol filling station adjacent to Oldham Road. The garage was present from 1967 to 2006. The garage has been redeveloped as a Tesco Express and the hardstanding to the rear is now occupied by residential development. It is reported that a Phase II Ground investigation Report, report ref. 7355A and dated April 2022 was produced by Sub Surface North West Limited. The investigation comprised of 5 trial pits, 9 boreholes. Made ground was encountered on the site and depths ranging between 0.80m and 9.00m. Within the areas of the historic infilled ponds, made ground was recorded to a maximum depth of 6.50m. Lead contamination, asbestos and PAH contamination was encountered across the site and as such a formal Remediation Strategy was required to address the contamination found. It is apparent from the Sub Surface RemStrat (Report NO 7355B dated April 2022) that: ▪ Made ground was encountered to variable depths across the site ranging from 0.80m to 9.00m. The made ground could be generally characterised as granular material comprising dark grey and dark greyish brown locally ashy gravelly very sandy or cohesive material comprising very soft to soft brown and grey gravelly silty clay. Gravel sized fragments consisted of stone, brick, concrete, tile, clinker, and occasional clay pipe, wood and glass. ▪ Some buried peat was also encountered (Borehole No 2 4.6 – 5.4 m bgl).

Potential Source	ZZE Comment
	▪ A chemical odour was noted at Borehole Nos Borehole No 11 below 4.9 m. ▪ Organic silt was encountered from 0.80m to 1.50m in TP8. Gas monitoring was undertaken and Sub Surface characterises the risks to the proposed residential development on the infilled pits/ponds as being CS2 (low). Sub Surface recommended a gas membrane and sub floor ventilation. No assessment of the potential risks to off site receptors such as the adjacent Tesco Express, school or residential dwellings. It is therefore assumed that Sub Surface concluded that the gas risks were confined to the development site itself, and possibly only houses being constructed directly over the infilled pits/ponds. Google Earth photographs show this site as an area of rough vegetated land up to 2022 with the development of a small residential housing estate off a single cul-de-sac road (Middle farm Close) in 2023.
Pond 157 m to the east	This is likely to be the same feature as discussed above.
Pond 175 m to the west	Sub Surface reports that this pond was 'infilled by 1932'. Review of the historic OS maps indicates that this pond was located in the north-west corner of the former sand pit. By the mid-1970's the pond was developed over by a Ambulance Depot to the west of Baker Street with new housing immediately to the east. ZZE considers that this former pond does not represent a significant gas risk to the current development being assessed.
Pond 178 m south-south-west	Sub Surface reports that this pond was only evident on the earliest maps from the 1800's and was 'infilled by 1909'. This pond appears to be actually to the west-south-west of the site and is also within the former sand pit to the west of the football field. It appears to have been reclaimed as part of the Football & Athletic Ground development shown on the 1909 OS map which is now occupied by residential development. ZZE considers that this former pond does not represent a significant gas risk to the current development being assessed.
Pond 210 m to the north-north-east	Sub Surface reports that this was labelled as a 'reservoir by 1909 and infilled by 1953'. On the 1932 OS map this reservoir is located very close to the Soudan Mills (Cotton) and by the mid 1950's has been developed over by a large residential housing estate.

Potential Source	ZZE Comment
	ZZE considers that this former pond does not represent a significant gas risk to the current development being assessed.

Table 5.1 - Potential Gas Source Discussion

ZZE considers that the potential for significant gas generation at any of the identified potential off-site gas sources at sufficient levels to affect the proposed development at the Kenyon Road site is very low.

5.3 POTENTIAL MIGRATION PATHWAYS

In order for gas to affect the development site, a pathway must exist, linking the potential source(s) with the target.

The ground conditions at the site comprise made ground/topsoil overlying a layer of subsoil (silt and sand) which are underlain by low permeability glacial clay.

With the exception of the former sand pit each of the identified potential sources of gas are infilled ponds. Therefore, some degree of natural containment was in place preventing the dewatering of these features prior to them being infilled.

Beneath the glacial clay is undifferentiated Pennine Lower Coal Measures rocks (mudstone, siltstone and sandstone). It is estimated that rockhead is around 10 m below ground level, based on investigation records for the development site to the west.

The natural glacial clay and any mudstone rocks will provide a barrier to the migration of gas from off-site sources including deep coal bearing strata.

5.4 POTENTIAL RECEPTORS

The proposed development comprises eight new dwellings constructed through the central part of the site, with parking, gardens and landscaping. Areas of landscaping are also indicated (see White Box Architecture Drawing No 2693-200 Rev C- Proposed Landscaping Plan at Appendix F).

Part (ii) of the planning condition lists specific potential receptors that are to be considered, as follows:

- human health, property (existing or proposed) including buildings, crops, livestock, pets, woodland, and service lines and pipes
- adjoining land
- groundwaters and surface waters

- ecological systems
- archaeological sites and ancient monuments

5.5 GAS RISK ASSESSMENT

ZZE has reviewed the desk study findings and considers that 'groundwaters and surface waters' do not need to be considered as part of a gas risk assessment. There are no 'archaeological sites and ancient monuments', 'crops', 'livestock' or areas of 'woodland' in the vicinity of the development site. Therefore, these potential receptors do not need any further specific consideration as part of this assessment.

The key potential receptors, to be considered are the proposed residential properties to be constructed at the site, including services and their occupants, pets etc.

In the event that the site itself is a potential source of hazardous ground gas, adjoining land and the neighbouring residential properties could also be considered viable receptors.

- (i) Human health, property service lines and pipes

No potential gas sources have been identified at the site itself.

Potential gas risks from the identified off-site sources are considered to be very low.

- (ii) Adjoining land

No potential gas sources have been identified at the site itself.

Any risks to adjoining land and property relate to off-site gas sources which will not be affected by the proposed development.

5.6 GAS RISK ASSESSMENT CONCLUSIONS

On the basis of the qualitative risk assessment carried out it is evident that the identified gas sources do not represent a significant potential hazard and therefore no specific gas risks exist at the site.

Therefore, no gas mitigation or remediation measures are required to protect the new houses and future occupants.

No radon protection measures are required.

6. CONTAMINATION RISK ASSESSMENT

6.1 CONCEPTUAL SITE MODEL

In this section Zig Zag Environmental considers the potential risks associated with ground contamination. ZZE identifies sources of potential contaminants of concern, pathways and receptors that may be affected based on historical and current land uses and the results of the ground investigation. The information is used to develop a conceptual site model to identify potential pollutant linkages.

It is noted that if no pathway exists between a contaminant and a receptor, then in effect there would be no 'pollutant linkage'.

6.2 POTENTIAL CONTAMINANTS OF CONCERN

The investigation undertaken at the site has identified asbestos, lead and PAHs within the made ground/topsoil strata at concentrations above the human health assessment criteria for residential land use.

Lead and dibenzo(ah)anthracene UCL95 concentrations also exceed the limits for public open space close to residential development.

6.3 CONTAMINATION FROM OFF-SITE SOURCES

No specific potential off site sources of ground contamination have been identified in the vicinity of the site, which is surrounded on all sides by residential properties.

Potential risks from off-site contamination sources are therefore considered to be very low. Potential gas risks are assessed separately, refer to Section 5.

6.4 POTENTIAL CONTAMINATIVE PATHWAYS

The pathways through which contaminants may reach the identified key receptors, are in part dependent on the nature and behaviour of the contaminant as well as the proposed end use (residential).

The following potential pathways will be assessed in the conceptual site model:

- (i) Direct dermal contact.
- (ii) Ingestion (eg of soil or dust).
- (iii) Inhalation of contaminants in the particulate form including asbestos fibres.

- (iv) Migration of contaminants through shallow superficial soils towards the River Irk, located to the north of the site or to deep groundwater contained within the Coal Measures rocks.

6.5 POTENTIAL RECEPTORS

Planning permission has been granted for '*erection of 8 dwellings with associated parking and landscaping with access from Rose Street and Lily Street*'. The approved development layout is illustrated on White Box Architecture Drawing No 2693-200 Rev C- Proposed Landscaping Plan at Appendix F.

Part (ii) of planning condition 18 lists specific potential receptors that are to be considered, as follows:

- human health, property (existing or proposed) including buildings, crops, livestock, pets, woodland, and service lines and pipes
- adjoining land
- groundwaters and surface waters
- ecological systems
- archaeological sites and ancient monuments

ZZE has reviewed the desk study findings and considers that there are no 'archaeological sites and ancient monuments', 'crops', 'livestock' or areas of 'woodland' in the vicinity of the site. Therefore, these potential receptors do not need any further specific consideration as part of this assessment.

The key potential receptors, to be considered are as follows:

On Site

- (i) Future Site Users
- (ii) Buildings and Services
- (iii) Construction Workers

Off Site

- (a) Residents at the adjacent properties
- (b) Buildings and property on neighbouring land

(c) Controlled waters (groundwater & surface water)

6.6 POSSIBLE SIGNIFICANT POLLUTANT LINKAGES

Contamination has been identified within the shallow made ground and topsoil strata, which represents a potential hazard to the proposed residential development. A number of potentially significant pollutant linkages exist, as follows:

- Dermal contact with contaminated topsoil.
- Ingestion of soil and dust including asbestos fibres.
- Consumption of homegrown produce grown in contaminated soil.

6.7 RISK ASSESSMENT

The assessment of risk is based on the concept of the source – pathway - receptor linkage.

Risks posed to each of the identified potential receptors are discussed separately below in accordance with CIRIA Guidance Document: Contaminated Land Risk Assessment – A Guide to Good Practice. An environmental risk rating of Low, Moderate or High has been assigned to each identified receptor.

6.7.1 POTENTIAL RISKS TO HUMAN HEALTH

The soil chemistry as determined through chemical analysis have been assessed against assessment criteria for residential land use with homegrown produce.

It can be seen, from the results presented in Appendix B and summarised in Tables 4.1 to 4.3, that elevated concentrations of lead and PAHs have been identified, in addition to the presence of asbestos fibres.

As a consequence, specific remediation and/or mitigation measures will be required to address the potential risk to human health from the identified contaminants.

6.7.2 POTENTIAL RISKS TO BUILDING STRUCTURE

ZZE has not completed the United Utilities risk assessment to inform the selection of water supply pipes but assuming that the contaminated topsoil is to be removed it is unlikely that any specific precautions would be required.

The structural engineer should take account of the pH and sulphate results when designing the foundations, the results for the subsoil stratum are summarised as follows:

pH 6.56 – 7.08

Total Sulphate <200 mg/kg
2:1 Sulphate <0.01 g/l

Using BRE Special Digest 1 concrete in aggressive ground it can be seen that the design sulfate class for the site is DS-1.

The risk to buildings and infrastructure from existing ground conditions at the site is considered to be Low.

The potential risks associated with ground contamination to neighbouring property is considered to be Very Low.

Potential gas risks are assessed at Section 6.

6.7.3 POTENTIAL RISKS TO CONSTRUCTION WORKERS

The potential risks to construction workers is considered to be Low to Moderate depending on the activities being carried out. Risks will be greatest to groundworkers and anyone involved with site clearance works, foundations and services.

Relatively low levels of ground contamination, including asbestos have been identified therefore construction workers will be exposed to potential contamination hazards.

Notwithstanding the risks are relatively low and would be mitigated by construction workers taking standard health & safety precautions including wearing appropriate personal protective equipment (PPE) which may include dust masks for specific works.

6.7.4 POTENTIAL RISKS TO ADJACENT PROPERTY & OCCUPANTS

The risk to occupants of adjacent properties from contamination is considered to be Low.

There is relatively low potential for asbestos fibre release from the surface asbestos cement debris and low levels of contamination in the shallow made ground and thick topsoil across the site.

Risks are greatest during site clearance and topsoil stripping particularly if these activities are carried out during prolonged dry weather.

6.7.5 POTENTIAL RISKS TO CONTROLLED WATERS

GROUNDWATER

The ground conditions at the site comprise a layer of silty sand/silt subsoil overlying glacial till/Boulder Clay and undifferentiated Coal Measures rocks.

No shallow groundwater was encountered within the subsoil stratum, perched on the underlying low permeability clay within the shallow depths of the trial pits excavated.

The glacial clay is classified as a Secondary A Aquifer although the glacial clays of this area are more typically unproductive strata which are '*rock layers and drift deposits with low permeability that have negligible significance for water supply or river base flow*'. This stratum will act as a barrier to the potential movement of contaminants within shallow made ground and underlying rock strata.

The Coal Measures strata are also classified as a Secondary A Aquifer, comprising predominantly low permeability layers which may store and yield limited amounts of groundwater. This stratum is not in hydraulic continuity with the ground surface of the site because of the natural low permeability clay barrier.

The site is not within a currently defined groundwater source protection zone and no source protection zones are located within 500 m of the site.

There are no groundwater abstractions within 250 m of the site.

The potential risks to groundwater, from the identified contamination within the made ground and topsoil at the site are therefore considered to be negligible.

SURFACE WATER

There are no surface water bodies at the site or in the immediate environs.

The nearest surface watercourse is the River Irk which is located some 350 m to the north of the site.

There are no surface water abstractions within 450 m of the site.

The potential risks to surface water, from contaminants identified at the site are considered to be negligible.

6.7.6 RISK ASSESSMENT CONCLUSIONS

Based on the investigation and risk assessment findings the potential risks associated with contamination ground are considered to be significant and therefore specific remediation/mitigation measures are recommended.

Gas risks are assessed at Section 5 and considered to be Low.

7. CONCLUSIONS

ZZE has been commissioned by GR Jones Property Ltd to assess the ground conditions at land to the rear of Kenyon Lane, Middleton with respect to potential contamination and undertake additional investigations as necessary to satisfy the planning conditions.

The following conclusions have been drawn from the investigation findings and associated background information:

- (i) Asbestos containing materials are present at the site in the form of asbestos cement panelling which presumably came from the garages that were present on the northern and western parts of the site.
- (ii) Isolated and thin made ground deposits are present. These comprise either construction/ demolition materials or topsoil containing anthropogenic materials such as plastic, metal and wood.
- (iii) Extensive topsoil is present across the site. Analysis proves the topsoil contains asbestos fibres, as well as elevated concentrations of lead and polyaromatic hydrocarbons. Remediation measures will be required to mitigate the potential risks associated with the contaminated topsoil.
- (iv) Contaminant concentrations reported for the made ground and topsoil strata are above the assessment criteria for residential land use. One subsoil sample contains slightly elevated PAHs.
- (v) No potential source(s) of hazard ground gas have been identified at the site.
- (vi) The site does not represent a hazard to off-site receptors including controlled waters, neighbours and neighbouring property.
- (vii) Radon protection measures are not required.
- (viii) Sub Surface identified potential sources of hazardous gas at a number of off-site locations within 250 m of the site and recommended gas monitoring. ZZE has discounted these as being significant to the proposed development through further research and a qualitative risk assessment. No gas mitigation measures are required.

These conclusions are based on a relatively low number of samples and therefore could be reviewed and updated if further investigation, sampling and testing is carried out.

This report has been produced to satisfy Condition No 18 of Planning Permission Ref 22/01223/FUL.

8. RECOMMENDATIONS

Based on the investigation and risk assessment findings ZZE recommends that:

- Thorough site clearance should be undertaken prior to the commencement of the development including the removal of all asbestos containing materials.
- The contaminated made ground should be removed from site and be replaced in residential gardens with clean uncontaminated topsoil/turf.
- Remove the contaminated topsoil and/or provide 600 mm clean capping layer and separator textile in all residential gardens.
- Remove the contaminated topsoil and/or provide 300 mm clean capping layer and separator textile in landscaped areas outside of the residential plots.
- Any imported topsoil should be sampled and analysed for contamination. Samples should be collected at a frequency of 1 per 50 m³ with a minimum of three per source. Refer to the proposed RemStrat at section 9 for further details.
- Further subsoil sampling should be undertaken around Trial Pit 3 following site clearance works.

These recommendations are based on a relatively low number of samples and therefore could be reviewed and updated if further investigation, sampling and testing is carried out.

9. REMEDIATION STRATEGY

9.1 REMEDIATION/MITIGATION MEASURES

Remediation or mitigation measures are required to address the lead, PAH and asbestos contamination identified in the shallow made ground and topsoil strata.

Contaminated made ground should be removed for off-site disposal as part of the general site clearance works.

A clean capping layer should be provided within the residential gardens and landscaped areas. Alternatively, the contaminated topsoil could be removed completely for off-site disposal or re-use.

Topsoil should be removed from beneath roads, structures and hard surfacing

These works will be subject to independent supervision and validation.

The independent assessor should:

- (i) inspect the site following site clearance and removal of the contaminated made ground,
- (ii) inspect the site each individual garden to ensure that either contaminated topsoil has been completely removed or a separator geotextile and clean capping layer has been provided,
- (iii) inspect landscaped areas to validate placement of the separator geotextile and clean topsoil capping layer, and
- (iv) collect samples of imported clean topsoil for validation testing.

If there are any concerns that some contaminated material remains further sampling and laboratory testing should be carried out.

9.2 FURTHER SAMPLING

Further investigation, sampling and testing may be undertaken in order to assess areas of topsoil in greater detail with a view to the soil being re-used, as long as this can be supported by the additional data generated.

Additional subsoil sampling and testing should be undertaken in the vicinity of Trial Pit No 3 to determine whether the elevated PAHs identified are widespread in this section of the site. Samples should be analysed for speciated PAHs only unless concerns regarding other potential contaminants are highlighted during soil sampling.

The test results should be used to determine whether any further remediation or mitigation measures are required in this area of the site.

Imported soils should be sampled in accordance with Section 9.5.

9.3 WASTE DISPOSAL

Any material disposed off-site should be fully characterised in accordance with Environment Agency guidance and should satisfy the Duty of Care requirements.

Records should be maintained by the developer. This applies to the general site clearance works, asbestos disposal and the disposal of the contaminated soils.

9.4 CAPPING

Residential gardens should be capped with a separator geotextile and minimum of 600 mm clean soil nominally comprising 450 mm subsoil and 150 mm topsoil.

Landscaped areas should be capped with a separator geotextile and a minimum of 300 mm of clean uncontaminated soil.

9.5 IMPORTED SOILS

It will be necessary to import clean soils to replace the excavated and removed topsoil.

All imported soils should be assessed and tested to confirm suitability. The validation of imported soils shall be undertaken in accordance with the YALPAG guidance. Where the clean imported soil source is greenfield then suitable evidence shall be provided to demonstrate that the source is actually greenfield (eg grid reference or boundary location of original source together with information about the environmental checks undertaken to show it is greenfield).

If soils are not from a greenfield source, then the applicant shall agree their sampling and analytical strategy with the LPA prior to undertaking the work. Testing and validation should as a minimum be undertaken in accordance with the YALPAG guidance and guidance listed within.

For greenfield sources sampling and laboratory testing shall be undertaken at the following frequencies:

Garden Areas: 1 per 50 m³ imported (minimum of 3 samples per source)

Landscaped Areas: 1 per 250 m³ (minimum of 3 samples per source)

Samples shall be analysed for a basic test suite at an appropriately accredited, independent laboratory. Testing should be to MCERTS standards where available.

Test Suite

pH

Metals (As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se & Zn)

Organic Matter

Sulphate

Asbestos Screen

Speciated PAHs

TPHCWG

Asbestos

For brownfield sources the sampling and testing shall be agreed with the LPA based on site specific conditions.

9.6 UNRECORDED CONTAMINATION

The developer and any appointed groundworks contractors should be aware that other previously unrecorded contamination might be encountered or identified during the redevelopment of the site.

If, in the course of site clearance and ground works, any visual/olfactory signs of contamination are detected which had not previously been accounted for by the site investigation and assessment then works, in that area, should be suspended pending investigation and assessment.

Appropriate specialist advice should be sought and may result in further investigation and testing being carried out to determine the nature and extent of any such additional contamination. This information can be used to determine any further remedial measures required and the remediation statement can be updated or amended as necessary.

If the contamination identified is of limited extent it might be possible to remove it for temporary storage in a quarantine area pending further investigation and assessment. This might allow development works to continue.

The local authority should be notified if such a situation arises.

A detailed record of any such occurrence should be maintained by the supervising engineer and this will be presented in the final completion report.

9.7 COMPLETION REPORT

A completion report should be produced on completion of the remediation works and should include the following information

- (i) A general description of works undertaken, including any supplementary investigation, excavation and removal of contaminated made ground/topsoil.
- (ii) Verification of the removal and disposal of any material from the site, as necessary.
- (iii) Verification of capping layer thicknesses and installation of the separator geotextile in gardens and landscaped areas.
- (iv) The chemical composition of imported topsoil and/or subsoil and verification of its suitability for use in gardens and/or landscaped areas.
- (v) Details of any unforeseen contamination identified during the works and any additional remediation measures undertaken.

The Completion Report should be submitted to and approved by the LPA prior to occupation/use of the site.



APPENDIX A

TRIAL PIT RECORDS

ZIG ZAG ENVIRONMENTAL LIMITED

CLIENT	GR Property Limited	TRIAL PIT	1
SITE	Land to the Rear of Kenyon Lane, Middleton	DATE	14/11/24

DEPTH (M)	STRATA DESCRIPTION	SAMPLE	SAMPLE DEPTH (M)
0.0 - 1.0	Black TOPSOIL with some roots	B	0.2
1.0 - 1.4	Light brown/orange SAND with some clods of clay and occasional fmc gravel	B	1.2
1.4 - 1.6	Light grey/orange firm to stiff slightly sandy silty CLAY with some fmc rounded gravel		

EXCAVATION METHOD	JCB 16/C1 1.5 tonne excavator
DIMENSIONS	1.5 x 0.4 x 1.6 m
STABILITY	Moderate
GROUNDWATER	None
REMARKS	

ZIG ZAG ENVIRONMENTAL LIMITED

CLIENT	GR Property Limited	TRIAL PIT	2
SITE	Land to the Rear of Kenyon Lane, Middleton	DATE	14/11/24

DEPTH (M)	STRATA DESCRIPTION	SAMPLE	SAMPLE DEPTH (M)
0.0 - 0.1	Black TOPSOIL with roots, wood, plastic, glass and bricks (MADE GROUND)	B	0.1
0.1 - 0.9	Black sandy TOPSOIL with some roots	B	0.3
0.9 - 1.4	Light grey/brown/orange slightly clayey slightly sandy SILT with occasional clods of clay and occasional fm gravel	B	1.2

EXCAVATION METHOD	JCB 16/C1 1.5 tonne excavator
DIMENSIONS	1.5 x 0.4 x 1.4
STABILITY	Moderate
GROUNDWATER	None
REMARKS	

ZIG ZAG ENVIRONMENTAL LIMITED

CLIENT	GR Property Limited	TRIAL PIT	3
SITE	Land to the Rear of Kenyon Lane, Middleton	DATE	14/11/24

DEPTH (M)	STRATA DESCRIPTION	SAMPLE	SAMPLE DEPTH (M)
0.0 - 0.7	Black sandy TOPSOIL with some roots	B	0.3
0.7 - 1.6	Light brown slightly silty SAND with occasional clods of clay and some fmc rounded gravel and occasional cobble	B	1.4

EXCAVATION METHOD	JCB 16/C1 1.5 tonne excavator
DIMENSIONS	1.5 x 0.4 x 1.6
STABILITY	Moderate
GROUNDWATER	None
REMARKS	

ZIG ZAG ENVIRONMENTAL LIMITED

CLIENT	GR Property Limited	TRIAL PIT	4
SITE	Land to the Rear of Kenyon Lane, Middleton	DATE	14/11/24

DEPTH (M)	STRATA DESCRIPTION	SAMPLE	SAMPLE DEPTH (M)
0.0 - 0.3	Black sandy TOPSOIL with some roots	B	0.15
0.3 - 1.6	Light grey/brown slightly silty SAND with occasional fmc rounded gravel		

EXCAVATION METHOD	JCB 16/C1 1.5 tonne excavator
DIMENSIONS	1.5 x 0.4 x 1.6 m
STABILITY	Moderate
GROUNDWATER	None
REMARKS	

ZIG ZAG ENVIRONMENTAL LIMITED

CLIENT	GR Property Limited	TRIAL PIT	5
SITE	Land to the Rear of Kenyon Lane, Middleton	DATE	14/11/24

DEPTH (M)	STRATA DESCRIPTION	SAMPLE	SAMPLE DEPTH (M)
0.0 - 0.15	Bricks in a sandy/soily matrix (MADE GROUND), possible footing to a small structure	B	0.1
0.15 - 0.6	Black TOPSOIL with some roots	B	0.4
0.6 - 1.5	Light grey/brown slightly silty SAND with some fmc rounded gravel		

EXCAVATION METHOD	JCB 16/C1 1.5 tonne excavator
DIMENSIONS	1.5 x 0.4 x 1.5 m
STABILITY	Moderate
GROUNDWATER	None
REMARKS	

ZIG ZAG ENVIRONMENTAL LIMITED

CLIENT	GR Property Limited	TRIAL PIT	6
SITE	Land to the Rear of Kenyon Lane, Middleton	DATE	14/11/24

DEPTH (M)	STRATA DESCRIPTION	SAMPLE	SAMPLE DEPTH (M)
0.0 - 0.35	Black TOPSOIL with some roots	B	0.15
0.35 - 1.6	Light grey/brown slightly silty SAND with some fmc rounded gravel		

EXCAVATION METHOD	JCB 16/C1 1.5 tonne excavator
DIMENSIONS	1.5 x 0.4 x 1.6
STABILITY	Moderate
GROUNDWATER	None
REMARKS	

ZIG ZAG ENVIRONMENTAL LIMITED

CLIENT	GR Property Limited	TRIAL PIT	7
SITE	Land to the Rear of Kenyon Lane, Middleton	DATE	14/11/24

DEPTH (M)	STRATA DESCRIPTION	SAMPLE	SAMPLE DEPTH (M)
0.0 - 0.4	Black TOPSOIL with some roots		
0.35 - 1.4	Light grey/brown slightly silty SAND with some fmc rounded gravel		

EXCAVATION METHOD	JCB 16/C1 1.5 tonne excavator
DIMENSIONS	1.5 x 0.4 x 1.4
STABILITY	Moderate
GROUNDWATER	None
REMARKS	



APPENDIX B

LAB TEST RESULTS

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 24/11165
Issue Number: 1

Date: 22 November, 2024

Client: Zig Zag Environmental Limited
Suite 10 Railway House
Railway Street
Chorley
Lancashire
PR6 0HW

Project Manager: Dave Killick/Martin Lovelock
Project Name: Kenyon Lane, Middleton
Project Ref: ZZ24035
Order No: 043/ZZ24035
Date Samples Received: 12/11/24
Date Instructions Received: 15/11/24
Date Analysis Completed: 22/11/24

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 24/11165

Client Project Name: Kenyon Lane, Middleton

Client Project Ref: ZZ24035

Lab Sample ID	24/11165/1	24/11165/2	24/11165/3	24/11165/4	24/11165/5	24/11165/6	24/11165/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP1	TP1	TP2	TP2	TP2	TP3	TP3			
Depth to Top	0.20	1.20	0.10	0.30	1.20	0.30	1.40			
Depth To Bottom										
Date Sampled	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24			
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D			
Sample Matrix Code	4ABE	5A	4AE	4AE	5A	4AE	1A			
% Stones >10mm _A	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	% w/w	0.1	A-T-044
pH _D ^{M#}	7.56	6.56	7.47	6.96	6.84	7.36	7.08	pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	g/l	0.01	A-T-026s
Sulphate (acid soluble) _D ^{M#}	1200	<200	770	390	<200	880	<200	mg/kg	200	A-T-028s
Cyanide (total) _A ^{M#}	1	<1	<1	<1	<1	<1	1	mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	0.2	A-T-050s
Organic Matter _D ^{M#}	17.4	1.8	12.6	5.4	1.5	16.3	0.4	% w/w	0.1	A-T-032s
Arsenic _D ^{M#}	35	3	18	15	<1	30	<1	mg/kg	1	A-T-024s
Boron (water soluble) _D ^{M#}	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	mg/kg	1	A-T-027s
Cadmium _D ^{M#}	1.6	<0.5	1.4	0.6	<0.5	0.9	<0.5	mg/kg	0.5	A-T-024s
Copper _D ^{M#}	91	18	322	43	15	97	8	mg/kg	1	A-T-024s
Chromium _D ^{M#}	57	13	19	12	15	21	7	mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-040s
Lead _D ^{M#}	848	40	584	63	13	233	11	mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	44	13	20	12	16	32	7	mg/kg	1	A-T-024s
Selenium _D ^{M#}	1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-024s
Zinc _D ^{M#}	427	72	417	632	154	232	18	mg/kg	5	A-T-024s

Envirolab Job Number: 24/11165

Client Project Name: Kenyon Lane, Middleton

Client Project Ref: ZZ24035

Lab Sample ID	24/11165/1	24/11165/2	24/11165/3	24/11165/4	24/11165/5	24/11165/6	24/11165/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP1	TP1	TP2	TP2	TP2	TP3	TP3			
Depth to Top	0.20	1.20	0.10	0.30	1.20	0.30	1.40			
Depth To Bottom										
Date Sampled	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24			
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D			
Sample Matrix Code	4ABE	5A	4AE	4AE	5A	4AE	1A			
Asbestos in Soil (inc. matrix) ^										
Asbestos in soil [#]	Amosite	-	Amosite	NAD	-	NAD	-			A-T-045
Asbestos Matrix (visual) _o	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope) _o	Loose Fibres	-	Loose Insulation	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _o	N/A	-	N/A	N/A	-	N/A	-			A-T-045
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing) _o	<0.001	-	0.001	-	-	-	-	% w/w	0.001	A-T-054

Envirolab Job Number: 24/11165

Client Project Name: Kenyon Lane, Middleton

Client Project Ref: ZZ24035

Lab Sample ID	24/11165/1	24/11165/2	24/11165/3	24/11165/4	24/11165/5	24/11165/6	24/11165/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP1	TP1	TP2	TP2	TP2	TP3	TP3			
Depth to Top	0.20	1.20	0.10	0.30	1.20	0.30	1.40			
Depth To Bottom										
Date Sampled	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24			
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D			
Sample Matrix Code	4ABE	5A	4AE	4AE	5A	4AE	1A			
PAH-16MS										
Acenaphthene _A ^{M#}	0.06	<0.01	0.15	0.15	<0.01	0.13	0.62	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.10	<0.01	0.07	0.06	<0.01	0.28	0.08	mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.17	<0.02	0.30	0.32	<0.02	0.53	1.06	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.90	<0.04	1.38	1.72	<0.04	3.25	2.85	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	1.13	<0.04	1.58	2.02	<0.04	3.64	2.85	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	1.44	<0.05	1.97	2.46	<0.05	4.52	3.49	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.77	<0.05	1.00	1.22	<0.05	2.16	1.65	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.53	<0.07	0.85	0.94	<0.07	1.79	1.45	mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	1.18	<0.06	1.82	2.15	<0.06	4.24	3.45	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.18	<0.04	0.25	0.29	<0.04	0.50	0.40	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	1.84	<0.08	3.08	3.41	<0.08	8.43	6.69	mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.05	<0.01	0.12	0.10	<0.01	0.16	0.40	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.80	<0.03	1.04	1.25	<0.03	2.35	1.70	mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	0.08	<0.03	0.14	0.16	<0.03	0.18	0.54	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.81	<0.03	1.53	1.43	<0.03	3.93	4.80	mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	1.65	<0.07	2.67	3.14	<0.07	6.84	6.05	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	11.7	<0.08	17.9	20.8	<0.08	42.9	38.1	mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/11165

Client Project Name: Kenyon Lane, Middleton

Client Project Ref: ZZ24035

Lab Sample ID	24/11165/1	24/11165/2	24/11165/3	24/11165/4	24/11165/5	24/11165/6	24/11165/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP1	TP1	TP2	TP2	TP2	TP3	TP3			
Depth to Top	0.20	1.20	0.10	0.30	1.20	0.30	1.40			
Depth To Bottom										
Date Sampled	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24			
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D			
Sample Matrix Code	4ABE	5A	4AE	4AE	5A	4AE	1A			
SVOC										
4-Bromophenyl phenyl ether _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Hexachlorobenzene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Diethyl phthalate _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Dimethyl phthalate _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Dibenzofuran _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Carbazole _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Butylbenzyl phthalate _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Bis(2-ethylhexyl)phthalate _A	-	-	-	-	-	-	<5000	µg/kg	500	A-T-052s
Bis(2-chloroethoxy)methane _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Bis(2-chloroethyl)ether _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
4-Nitrophenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
3+4-Methylphenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
4-Chloro-3-methylphenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2-Nitrophenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2-Methylphenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
1,2,4-Trichlorobenzene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2-Chlorophenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2,6-Dinitrotoluene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2,4-Dinitrotoluene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2,4-Dimethylphenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2,4-Dichlorophenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2,4,6-Trichlorophenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2,4,5-Trichlorophenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
1,4-Dichlorobenzene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
1,3-Dichlorobenzene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
1,2-Dichlorobenzene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2-Chloronaphthalene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2-Methylnaphthalene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Acenaphthylene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Acenaphthene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Anthracene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Benzo(a)anthracene _A	-	-	-	-	-	-	3090	µg/kg	100	A-T-052s

Envirolab Job Number: 24/11165

Client Project Name: Kenyon Lane, Middleton

Client Project Ref: ZZ24035

Lab Sample ID	24/11165/1	24/11165/2	24/11165/3	24/11165/4	24/11165/5	24/11165/6	24/11165/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP1	TP1	TP2	TP2	TP2	TP3	TP3			
Depth to Top	0.20	1.20	0.10	0.30	1.20	0.30	1.40			
Depth To Bottom										
Date Sampled	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24			
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D			
Sample Matrix Code	4ABE	5A	4AE	4AE	5A	4AE	1A			
Benzo(b)fluoranthene _A	-	-	-	-	-	-	2950	µg/kg	100	A-T-052s
Benzo(k)fluoranthene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Benzo(a)pyrene _A	-	-	-	-	-	-	2150	µg/kg	100	A-T-052s
Benzo(ghi)perylene _A	-	-	-	-	-	-	1840	µg/kg	100	A-T-052s
Chrysene _A	-	-	-	-	-	-	4760	µg/kg	100	A-T-052s
Fluoranthene _A	-	-	-	-	-	-	8010	µg/kg	100	A-T-052s
Fluorene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Indeno(1,2,3-cd)pyrene _A	-	-	-	-	-	-	1600	µg/kg	100	A-T-052s
Phenanthrene _A	-	-	-	-	-	-	5940	µg/kg	100	A-T-052s
Pyrene _A	-	-	-	-	-	-	7020	µg/kg	100	A-T-052s
Naphthalene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Dibenzo(ah)anthracene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Bis(2-chloroisopropyl)ether _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Phenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Pentachlorophenol _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
n-Nitroso-n-dipropylamine _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
n-Dioctylphthalate _A	-	-	-	-	-	-	<5000	µg/kg	500	A-T-052s
n-Dibutylphthalate _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Nitrobenzene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Isophorone _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Hexachloroethane _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Hexachlorobutadiene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Perylene _A	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s

Envirolab Job Number: 24/11165

Client Project Name: Kenyon Lane, Middleton

Client Project Ref: ZZ24035

Lab Sample ID	24/11165/1	24/11165/2	24/11165/3	24/11165/4	24/11165/5	24/11165/6	24/11165/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP1	TP1	TP2	TP2	TP2	TP3	TP3			
Depth to Top	0.20	1.20	0.10	0.30	1.20	0.30	1.40			
Depth To Bottom										
Date Sampled	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24			
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D			
Sample Matrix Code	4ABE	5A	4AE	4AE	5A	4AE	1A			
VOC										
Dichlorodifluoromethane _A	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Chloromethane _A	-	-	-	-	-	-	<10	µg/kg	10	A-T-006s
Vinyl Chloride (Chloroethene) _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Bromomethane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Chloroethane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Trichlorofluoromethane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,1-Dichloroethene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Carbon Disulphide _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Dichloromethane _A	-	-	-	-	-	-	<5	µg/kg	5	A-T-006s
trans 1,2-Dichloroethene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,1-Dichloroethane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
cis 1,2-Dichloroethene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
2,2-Dichloropropane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Bromochloromethane _A [#]	-	-	-	-	-	-	<5	µg/kg	5	A-T-006s
Chloroform _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,1,1-Trichloroethane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,1-Dichloropropene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Carbon Tetrachloride _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,2-Dichloroethane _A [#]	-	-	-	-	-	-	<2	µg/kg	2	A-T-006s
Benzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Trichloroethene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,2-Dichloropropane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Dibromomethane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Bromodichloromethane _A [#]	-	-	-	-	-	-	<10	µg/kg	10	A-T-006s
cis 1,3-Dichloropropene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Toluene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
trans 1,3-Dichloropropene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,1,2-Trichloroethane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,3-Dichloropropane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Tetrachloroethene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Dibromochloromethane _A [#]	-	-	-	-	-	-	<3	µg/kg	3	A-T-006s
1,2-Dibromoethane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s

Envirolab Job Number: 24/11165

Client Project Name: Kenyon Lane, Middleton

Client Project Ref: ZZ24035

Lab Sample ID	24/11165/1	24/11165/2	24/11165/3	24/11165/4	24/11165/5	24/11165/6	24/11165/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP1	TP1	TP2	TP2	TP2	TP3	TP3			
Depth to Top	0.20	1.20	0.10	0.30	1.20	0.30	1.40			
Depth To Bottom										
Date Sampled	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24			
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D			
Sample Matrix Code	4ABE	5A	4AE	4AE	5A	4AE	1A			
Chlorobenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,1,1,2-Tetrachloroethane _A	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Ethylbenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
m & p Xylene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
o-Xylene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Styrene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Bromoform _A [#]	-	-	-	-	-	-	<3	µg/kg	3	A-T-006s
Isopropylbenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,1,2,2-Tetrachloroethane _A	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,2,3-Trichloropropane _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
Bromobenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
n-Propylbenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
2-Chlorotoluene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,3,5-Trimethylbenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
4-Chlorotoluene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
tert-Butylbenzene _A [#]	-	-	-	-	-	-	<2	µg/kg	2	A-T-006s
1,2,4-Trimethylbenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
sec-Butylbenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
4-Isopropyltoluene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,3-Dichlorobenzene _A	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,4-Dichlorobenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
n-Butylbenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,2-Dichlorobenzene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,2-Dibromo-3-chloropropane (DCBP) _A	-	-	-	-	-	-	<2	µg/kg	2	A-T-006s
1,2,4-Trichlorobenzene _A	-	-	-	-	-	-	<3	µg/kg	3	A-T-006s
Hexachlorobutadiene _A [#]	-	-	-	-	-	-	<1	µg/kg	1	A-T-006s
1,2,3-Trichlorobenzene _A	-	-	-	-	-	-	<3	µg/kg	3	A-T-006s

Envirolab Job Number: 24/11165

Client Project Name: Kenyon Lane, Middleton

Client Project Ref: ZZ24035

Lab Sample ID	24/11165/1	24/11165/2	24/11165/3	24/11165/4	24/11165/5	24/11165/6	24/11165/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP1	TP1	TP2	TP2	TP2	TP3	TP3			
Depth to Top	0.20	1.20	0.10	0.30	1.20	0.30	1.40			
Depth To Bottom										
Date Sampled	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24			
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D	SOIL - D			
Sample Matrix Code	4ABE	5A	4AE	4AE	5A	4AE	1A			
TPH CWG with Clean Up										
Ali >C5-C6 _A	<0.01	-	<0.01	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C6-C8 _A	<0.01	-	<0.01	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1	-	<1	-	-	<1	<1	mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<1	-	<1	-	-	<1	<1	mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<1	-	<1	-	-	1	1	mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	1	-	3	-	-	3	2	mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	22	-	70	-	-	26	21	mg/kg	1	A-T-055s
Total Aliphatics _A	23	-	73	-	-	30	25	mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	<0.01	-	<0.01	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	-	0.01	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<1	-	4	-	-	3	<1	mg/kg	1	A-T-055s
Aro >C10-C12 _A	<1	-	3	-	-	1	<1	mg/kg	1	A-T-055s
Aro >C12-C16 _A	4	-	5	-	-	9	7	mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	19	-	25	-	-	51	40	mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	84	-	101	-	-	177	149	mg/kg	1	A-T-055s
Total Aromatics _A	107	-	138	-	-	241	195	mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35) _A	130	-	211	-	-	271	220	mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	<0.01	-	<0.01	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	-	0.01	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	-	0.01	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	-	0.07	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	-	0.05	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	-	<0.01	-	-	<0.01	<0.01	mg/kg	0.01	A-T-022s

Envirolab Job Number: 24/11165

Client Project Name: Kenyon Lane, Middleton

Client Project Ref: ZZ24035

Lab Sample ID	24/11165/8	24/11165/9	24/11165/10	24/11165/11				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP4	TP5	TP5	TP6						
Depth to Top	0.15	0.10	0.40	0.15						
Depth To Bottom										
Date Sampled	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24						
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D						
Sample Matrix Code	4AE	4ABE	4AE	4AE						
% Stones >10mm _A	<0.1	<0.1	<0.1	<0.1				% w/w	0.1	A-T-044
pH _D ^{M#}	6.72	8.10	7.06	7.08				pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	<0.01	0.03	<0.01	0.01				g/l	0.01	A-T-026s
Sulphate (acid soluble) _D ^{M#}	840	700	710	1100				mg/kg	200	A-T-028s
Cyanide (total) _A ^{M#}	<1	<1	<1	<1				mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2	<0.2				mg/kg	0.2	A-T-050s
Organic Matter _D ^{M#}	20.3	7.1	11.0	24.1				% w/w	0.1	A-T-032s
Arsenic _D ^{M#}	37	12	28	23				mg/kg	1	A-T-024s
Boron (water soluble) _D ^{M#}	<1.0	3.8	<1.0	<1.0				mg/kg	1	A-T-027s
Cadmium _D ^{M#}	1.0	1.4	0.5	0.7				mg/kg	0.5	A-T-024s
Copper _D ^{M#}	213	49	65	76				mg/kg	1	A-T-024s
Chromium _D ^{M#}	32	12	17	26				mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1				mg/kg	1	A-T-040s
Lead _D ^{M#}	495	156	114	545				mg/kg	1	A-T-024s
Mercury _D	0.71	<0.17	<0.17	<0.17				mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	29	18	23	23				mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	<1	1				mg/kg	1	A-T-024s
Zinc _D ^{M#}	436	206	107	168				mg/kg	5	A-T-024s

Envirolab Job Number: 24/11165

Client Project Name: Kenyon Lane, Middleton

Client Project Ref: ZZ24035

Lab Sample ID	24/11165/8	24/11165/9	24/11165/10	24/11165/11				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP4	TP5	TP5	TP6						
Depth to Top	0.15	0.10	0.40	0.15						
Depth To Bottom										
Date Sampled	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24						
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D						
Sample Matrix Code	4AE	4ABE	4AE	4AE						
Asbestos in Soil (inc. matrix) ^										
Asbestos in soil [#]	NAD	Chrysotile	NAD	NAD						A-T-045
Asbestos Matrix (visual) ₀	-	-	-	-						A-T-045
Asbestos Matrix (microscope) ₀	-	Loose Fibres & Loose Insulation	-	-						A-T-045
Asbestos ACM - Suitable for Water Absorption Test? ₀	N/A	N/A	N/A	N/A						A-T-045
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing) ₀	-	0.017	-	-				% w/w	0.001	A-T-054

Envirolab Job Number: 24/11165

Client Project Name: Kenyon Lane, Middleton

Client Project Ref: ZZ24035

Lab Sample ID	24/11165/8	24/11165/9	24/11165/10	24/11165/11				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP4	TP5	TP5	TP6						
Depth to Top	0.15	0.10	0.40	0.15						
Depth To Bottom										
Date Sampled	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24						
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D						
Sample Matrix Code	4AE	4ABE	4AE	4AE						
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	0.25	0.43	7.87				mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	0.07	0.05	0.28				mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	<0.02	0.50	0.66	7.45				mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04	1.87	2.05	12.4				mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04	1.96	2.08	10.6				mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05	2.41	2.43	12.3				mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	1.18	1.18	5.51				mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	0.86	0.91	4.98				mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	<0.06	2.35	2.50	13.6				mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	0.29	0.29	1.24				mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	<0.08	4.11	4.72	28.4				mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	0.16	0.27	4.84				mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03	1.21	1.21	5.82				mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	0.04	0.08	2.15				mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	<0.03	2.21	3.10	34.1				mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	<0.07	3.73	4.23	24.3				mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	<0.08	23.2	26.2	176				mg/kg	0.01	A-T-019s

Envirolab Job Number: 24/11165

Client Project Name: Kenyon Lane, Middleton

Client Project Ref: ZZ24035

Lab Sample ID	24/11165/8	24/11165/9	24/11165/10	24/11165/11				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP4	TP5	TP5	TP6						
Depth to Top	0.15	0.10	0.40	0.15						
Depth To Bottom										
Date Sampled	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24						
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D						
Sample Matrix Code	4AE	4ABE	4AE	4AE						
SVOC										
4-Bromophenyl phenyl ether _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Hexachlorobenzene _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Diethyl phthalate _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Dimethyl phthalate _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Dibenzofuran _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Carbazole _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Butylbenzyl phthalate _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Bis(2-ethylhexyl)phthalate _A	<500	-	-	<5000				µg/kg	500	A-T-052s
Bis(2-chloroethoxy)methane _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Bis(2-chloroethyl)ether _A	<100	-	-	<1000				µg/kg	100	A-T-052s
4-Nitrophenol _A	<100	-	-	<1000				µg/kg	100	A-T-052s
3+4-Methylphenol _A	<100	-	-	<1000				µg/kg	100	A-T-052s
4-Chloro-3-methylphenol _A	<100	-	-	<1000				µg/kg	100	A-T-052s
2-Nitrophenol _A	<100	-	-	<1000				µg/kg	100	A-T-052s
2-Methylphenol _A	<100	-	-	<1000				µg/kg	100	A-T-052s
1,2,4-Trichlorobenzene _A	<100	-	-	<1000				µg/kg	100	A-T-052s
2-Chlorophenol _A	<100	-	-	<1000				µg/kg	100	A-T-052s
2,6-Dinitrotoluene _A	<100	-	-	<1000				µg/kg	100	A-T-052s
2,4-Dinitrotoluene _A	<100	-	-	<1000				µg/kg	100	A-T-052s
2,4-Dimethylphenol _A	<100	-	-	<1000				µg/kg	100	A-T-052s
2,4-Dichlorophenol _A	<100	-	-	<1000				µg/kg	100	A-T-052s
2,4,6-Trichlorophenol _A	<100	-	-	<1000				µg/kg	100	A-T-052s
2,4,5-Trichlorophenol _A	<100	-	-	<1000				µg/kg	100	A-T-052s
1,4-Dichlorobenzene _A	<100	-	-	<1000				µg/kg	100	A-T-052s
1,3-Dichlorobenzene _A	<100	-	-	<1000				µg/kg	100	A-T-052s
1,2-Dichlorobenzene _A	<100	-	-	<1000				µg/kg	100	A-T-052s
2-Chloronaphthalene _A	<100	-	-	<1000				µg/kg	100	A-T-052s
2-Methylnaphthalene _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Acenaphthylene _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Acenaphthene _A	<100	-	-	2240				µg/kg	100	A-T-052s
Anthracene _A	<100	-	-	2600				µg/kg	100	A-T-052s
Benzo(a)anthracene _A	<100	-	-	6530				µg/kg	100	A-T-052s

Envirolab Job Number: 24/11165

Client Project Name: Kenyon Lane, Middleton

Client Project Ref: ZZ24035

Lab Sample ID	24/11165/8	24/11165/9	24/11165/10	24/11165/11				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP4	TP5	TP5	TP6						
Depth to Top	0.15	0.10	0.40	0.15						
Depth To Bottom										
Date Sampled	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24						
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D						
Sample Matrix Code	4AE	4ABE	4AE	4AE						
Benzo(b)fluoranthene _A	<100	-	-	9470				µg/kg	100	A-T-052s
Benzo(k)fluoranthene _A	<100	-	-	2700				µg/kg	100	A-T-052s
Benzo(a)pyrene _A	<100	-	-	5660				µg/kg	100	A-T-052s
Benzo(ghi)perylene _A	<100	-	-	3930				µg/kg	100	A-T-052s
Chrysene _A	<100	-	-	10300				µg/kg	100	A-T-052s
Fluoranthene _A	<100	-	-	22800				µg/kg	100	A-T-052s
Fluorene _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Indeno(1,2,3-cd)pyrene _A	<100	-	-	3500				µg/kg	100	A-T-052s
Phenanthrene _A	<100	-	-	16900				µg/kg	100	A-T-052s
Pyrene _A	<100	-	-	19200				µg/kg	100	A-T-052s
Naphthalene _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Dibenzo(ah)anthracene _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Bis(2-chloroisopropyl)ether _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Phenol _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Pentachlorophenol _A	<100	-	-	<1000				µg/kg	100	A-T-052s
n-Nitroso-n-dipropylamine _A	<100	-	-	<1000				µg/kg	100	A-T-052s
n-Dioctylphthalate _A	<500	-	-	<5000				µg/kg	500	A-T-052s
n-Dibutylphthalate _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Nitrobenzene _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Isophorone _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Hexachloroethane _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Hexachlorobutadiene _A	<100	-	-	<1000				µg/kg	100	A-T-052s
Perylene _A	<100	-	-	1760				µg/kg	100	A-T-052s

Envirolab Job Number: 24/11165

Client Project Name: Kenyon Lane, Middleton

Client Project Ref: ZZ24035

Lab Sample ID	24/11165/8	24/11165/9	24/11165/10	24/11165/11				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP4	TP5	TP5	TP6						
Depth to Top	0.15	0.10	0.40	0.15						
Depth To Bottom										
Date Sampled	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24						
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D						
Sample Matrix Code	4AE	4ABE	4AE	4AE						
VOC										
Dichlorodifluoromethane _A	<1	-	-	<1				µg/kg	1	A-T-006s
Chloromethane _A	<10	-	-	<10				µg/kg	10	A-T-006s
Vinyl Chloride (Chloroethene) _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
Bromomethane _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
Chloroethane _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
Trichlorofluoromethane _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
1,1-Dichloroethene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
Carbon Disulphide _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
Dichloromethane _A	<5	-	-	<5				µg/kg	5	A-T-006s
trans 1,2-Dichloroethene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
1,1-Dichloroethane _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
cis 1,2-Dichloroethene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
2,2-Dichloropropane _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
Bromochloromethane _A [#]	<5	-	-	<5				µg/kg	5	A-T-006s
Chloroform _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
1,1,1-Trichloroethane _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
1,1-Dichloropropene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
Carbon Tetrachloride _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
1,2-Dichloroethane _A [#]	<2	-	-	<2				µg/kg	2	A-T-006s
Benzene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
Trichloroethene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
1,2-Dichloropropane _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
Dibromomethane _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
Bromodichloromethane _A [#]	<10	-	-	<10				µg/kg	10	A-T-006s
cis 1,3-Dichloropropene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
Toluene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
trans 1,3-Dichloropropene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
1,1,2-Trichloroethane _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
1,3-Dichloropropane _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
Tetrachloroethene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
Dibromochloromethane _A [#]	<3	-	-	<3				µg/kg	3	A-T-006s
1,2-Dibromoethane _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s

Envirolab Job Number: 24/11165

Client Project Name: Kenyon Lane, Middleton

Client Project Ref: ZZ24035

Lab Sample ID	24/11165/8	24/11165/9	24/11165/10	24/11165/11				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP4	TP5	TP5	TP6						
Depth to Top	0.15	0.10	0.40	0.15						
Depth To Bottom										
Date Sampled	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24						
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D						
Sample Matrix Code	4AE	4ABE	4AE	4AE						
Chlorobenzene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
1,1,1,2-Tetrachloroethane _A	<1	-	-	<1				µg/kg	1	A-T-006s
Ethylbenzene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
m & p Xylene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
o-Xylene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
Styrene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
Bromoform _A [#]	<3	-	-	<3				µg/kg	3	A-T-006s
Isopropylbenzene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
1,1,2,2-Tetrachloroethane _A	<1	-	-	<1				µg/kg	1	A-T-006s
1,2,3-Trichloropropane _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
Bromobenzene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
n-Propylbenzene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
2-Chlorotoluene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
1,3,5-Trimethylbenzene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
4-Chlorotoluene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
tert-Butylbenzene _A [#]	<2	-	-	<2				µg/kg	2	A-T-006s
1,2,4-Trimethylbenzene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
sec-Butylbenzene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
4-Isopropyltoluene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
1,3-Dichlorobenzene _A	<1	-	-	<1				µg/kg	1	A-T-006s
1,4-Dichlorobenzene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
n-Butylbenzene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
1,2-Dichlorobenzene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
1,2-Dibromo-3-chloropropane (DCBP) _A	<2	-	-	<2				µg/kg	2	A-T-006s
1,2,4-Trichlorobenzene _A	<3	-	-	<3				µg/kg	3	A-T-006s
Hexachlorobutadiene _A [#]	<1	-	-	<1				µg/kg	1	A-T-006s
1,2,3-Trichlorobenzene _A	<3	-	-	<3				µg/kg	3	A-T-006s

Envirolab Job Number: 24/11165

Client Project Name: Kenyon Lane, Middleton

Client Project Ref: ZZ24035

Lab Sample ID	24/11165/8	24/11165/9	24/11165/10	24/11165/11				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP4	TP5	TP5	TP6						
Depth to Top	0.15	0.10	0.40	0.15						
Depth To Bottom										
Date Sampled	14-Nov-24	14-Nov-24	14-Nov-24	14-Nov-24						
Sample Type	SOIL - D	SOIL - D	SOIL - D	SOIL - D						
Sample Matrix Code	4AE	4ABE	4AE	4AE						
TPH CWG with Clean Up										
Ali >C5-C6 _A	<0.01	-	-	<0.01				mg/kg	0.01	A-T-022s
Ali >C6-C8 _A	<0.01	-	-	<0.01				mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1	-	-	<1				mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<1	-	-	<1				mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<1	-	-	3				mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	<1	-	-	4				mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	<1	-	-	25				mg/kg	1	A-T-055s
Total Aliphatics _A	<1	-	-	32				mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	<0.01	-	-	<0.01				mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	-	-	<0.01				mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<1	-	-	3				mg/kg	1	A-T-055s
Aro >C10-C12 _A	<1	-	-	1				mg/kg	1	A-T-055s
Aro >C12-C16 _A	<1	-	-	24				mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	<1	-	-	108				mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	1	-	-	288				mg/kg	1	A-T-055s
Total Aromatics _A	1	-	-	424				mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35) _A	1	-	-	456				mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	<0.01	-	-	<0.01				mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	-	-	<0.01				mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	-	-	<0.01				mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	-	-	<0.01				mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	-	-	<0.01				mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	-	-	<0.01				mg/kg	0.01	A-T-022s

Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- The results reported herein relate only to the material supplied to the laboratory.
- The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
- Analytical results reflect the quality of the sample at the time of analysis only.
- Opinions and Interpretations expressed are outside our scope of accreditation.
- A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to ‘HSG264, Asbestos: The survey guide’ and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). “TRACE” will be reported as a quantification result.

PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs
Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.					

Soil Chemical Analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as ‘% stones >10mm’.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any “D” subscripts.

TPH by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only. Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

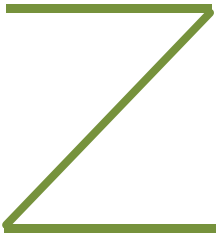
Please contact your client manager if you require any further information.

Envirolab Analysis Dates

Lab Sample ID	24/11165/1	24/11165/2	24/11165/3	24/11165/4	24/11165/5	24/11165/6	24/11165/7	24/11165/8	24/11165/9	24/11165/10	24/11165/11
Client Sample No											
Client Sample ID/Depth	TP1 0.20m	TP1 1.20m	TP2 0.10m	TP2 0.30m	TP2 1.20m	TP3 0.30m	TP3 1.40m	TP4 0.15m	TP5 0.10m	TP5 0.40m	TP6 0.15m
Date Sampled	14/11/24	14/11/24	14/11/24	14/11/24	14/11/24	14/11/24	14/11/24	14/11/24	14/11/24	14/11/24	14/11/24
A-T-006s							19/11/2024	19/11/2024			19/11/2024
A-T-019s	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024
A-T-022s	19/11/2024		19/11/2024			19/11/2024	19/11/2024	19/11/2024			19/11/2024
A-T-024s	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024	22/11/2024
A-T-026s	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024
A-T-027s	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024
A-T-028s	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024
A-T-031s	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024
A-T-032s	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024
A-T-040s	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024
A-T-042sTCN	19/11/2024	19/11/2024	19/11/2024	19/11/2024	19/11/2024	19/11/2024	19/11/2024	19/11/2024	19/11/2024	19/11/2024	19/11/2024
A-T-044	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024	21/11/2024
A-T-045	18/11/2024		18/11/2024	18/11/2024		18/11/2024		18/11/2024	18/11/2024	18/11/2024	18/11/2024
A-T-050s	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024	20/11/2024
A-T-052s							20/11/2024	20/11/2024			20/11/2024
A-T-054	21/11/2024		21/11/2024						21/11/2024		
A-T-055s	19/11/2024		19/11/2024			19/11/2024	19/11/2024	19/11/2024			19/11/2024
Calc-As Recd	19/11/2024		19/11/2024			19/11/2024	19/11/2024	19/11/2024			19/11/2024

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

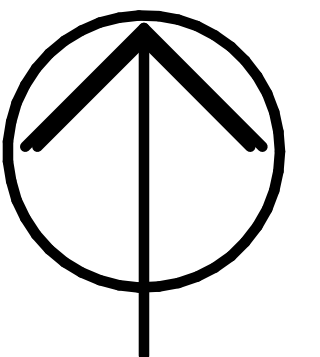
End of Report



APPENDIX C
DRAWINGS



COLLINGS AVENUE



 HOUSE TYPE A

 HOUSE TYPE B

 **Proposed Landscaping Plan**
1 : 200

BIN STORE PRECEDENT

C	Ecology Report	19.04.24		
B	Site layout and bedroom arrangement updated in response to planner feedback	12.04.23	JW	IS
A	Updated for planner feedback	11.07.23	JW	IS

WhiteBox Architecture

RIBA Architects & Interior Designers

studio@whiteboxarchitecture.com//www.whiteboxarchitecture.com

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project
Middleto

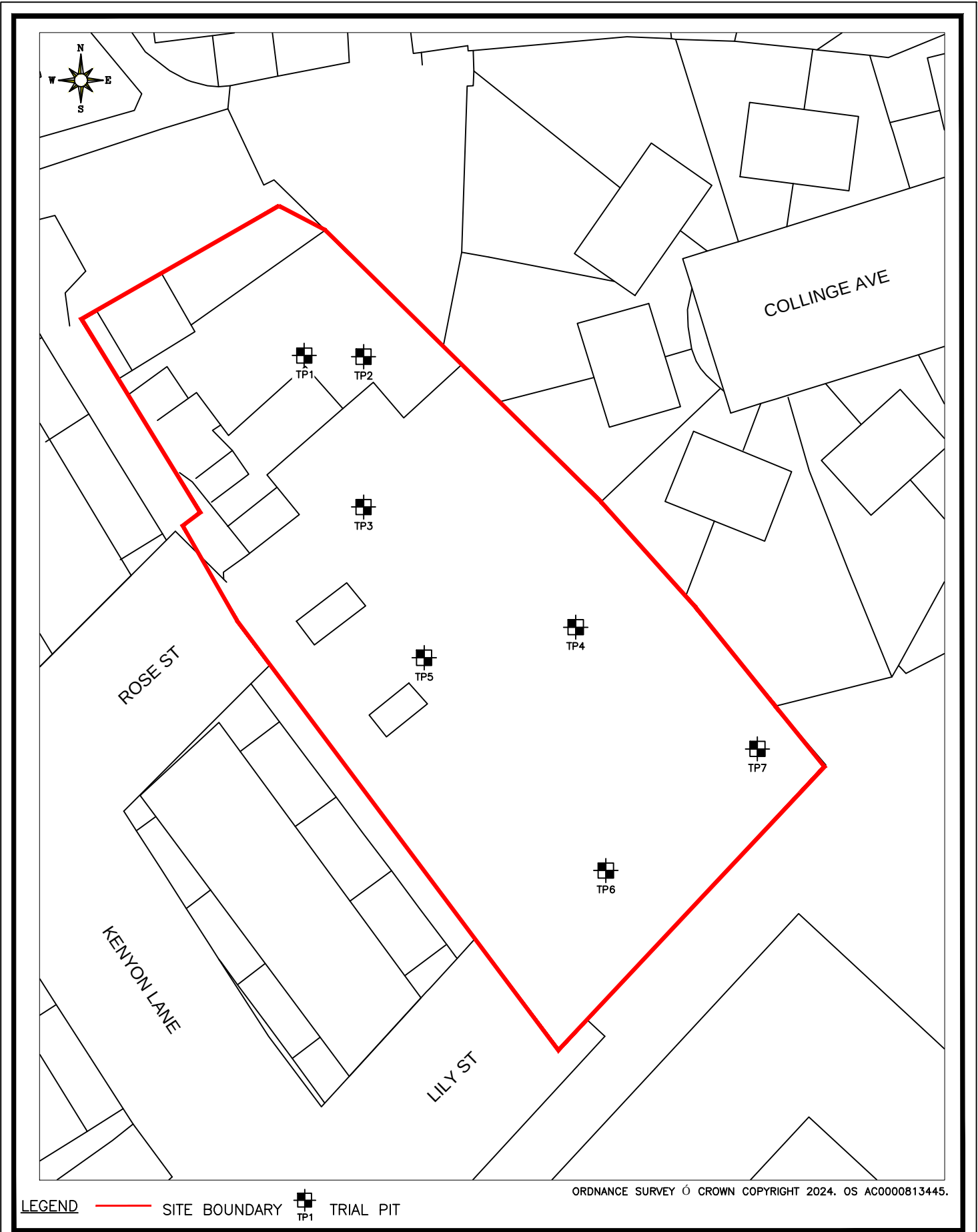
drawing title
Proposed Landscaping Plan

scale	date	drawn	checked
As indicated@A1	10/24/23	JW	IS

job number	drawing number	revision
2693	200	C

2693 200 C

1) whitebox architecture



LEGEND

— SITE BOUNDARY

TP1 TRIAL PIT

ORDNANCE SURVEY Ó CROWN COPYRIGHT 2024. OS AC0000813445.



CLIENT GR JONES PROPERTY LIMITED	DRAWN BY. M.Y.B	APPROVED BY. M.L
JOB TITLE. LAND TO THE REAR OF KENYON LANE, MIDDLETON	DATE. 25/11/2024	DRAWING No. ZZ24035
DRAWING TITLE. TRIAL PIT LOCATIONS	SCALE A4. 1:500	