



EARTH ENVIRONMENTAL
& GEOTECHNICAL



Remediation Strategy

Moss Lane East

Manchester

November 2022

On behalf of

MAI Construction



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**MOSS LANE EAST
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FOR
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1.0 INTRODUCTION

Appointment

Earth Environmental & Geotechnical Ltd (EEG) has been commissioned by MAI Construction (the client), to develop a Remediation Strategy for the proposed new residential development at a site off Moss Lane East, Manchester.

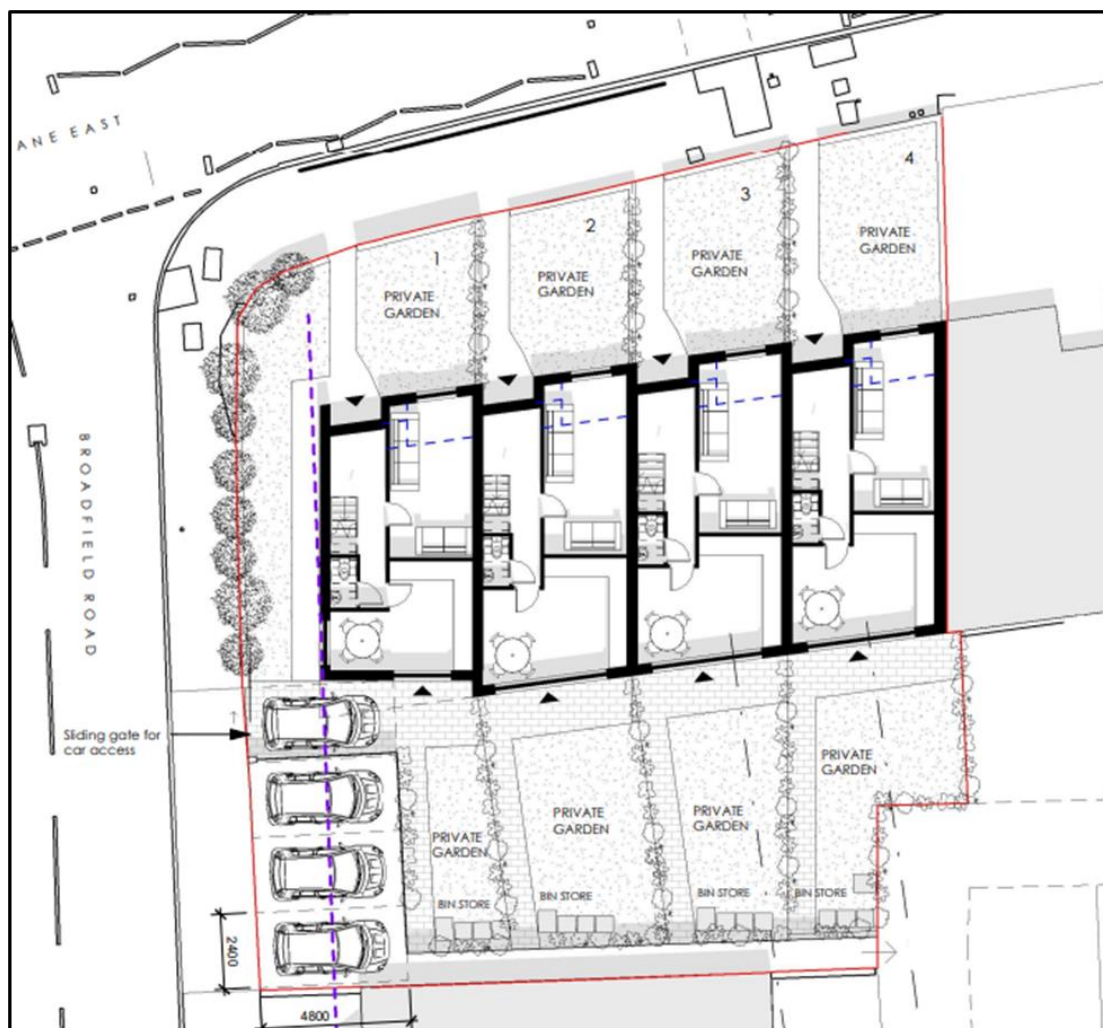
The Remediation Strategy is required due to the findings of a site investigation by Earth Environmental & Geotechnical Ltd in July and September 2022.

Proposed Development

It is understood that the client wishes to construct four residential dwellings with rear and front garden areas and a parking bay in the southwest of site for residents. Access will be provided via Broadfield Road to the west of the site.

Details of the proposed development layout are provided below in Figure 1.

Figure 1: Proposed Development Layout Plan



Objective

The Remediation Strategy is intended to provide details on the remediation objectives necessary to protect potential receptors and render the site suitable for the proposed development.

Earth Environmental & Geotechnical Ltd reserves the right to amend this RMS considering further information which may become available or future changes in contaminated land guidance, prior to site activities.

Sources of Information

The RMS includes a review of the following report:

- Earth Environmental & Geotechnical Ltd – Geo-Environmental Site Investigation Report, Moss Lane East, Manchester (Reference A4320/21), dated November 2022.

This report is provided as Appendix 1.

2.0 SITE LOCATION AND DESCRIPTION

The site is located off Moss Lane East, Manchester. The approximate National Grid Reference for the centre of the site is SP 84187 95704 (X: 384187, Y: 395704) with the closest postcode being M14 4WB.

The site is a roughly rectangular parcel of land with access via Moss Lane East to the north and Broadfield Road to the west. The maximum dimensions of the proposed site are approximately 25m north to south and 23m east to west. The site occupies an area of approximately 0.05 hectares. The site is generally flat and level.

The general surrounding area comprised predominantly residential buildings.

A location plan is shown below as Figure 2.

Figure 2: Site Location Plan



3.0 PREVIOUS SITE INVESTIGATIONS

3.1 Earth Environmental & Geotechnical – Geo-Environmental Site Investigation Report, Moss Lane East, Manchester (Reference A4320/21), dated November 2022.

Scope of Works

Earth Environmental & Geotechnical Ltd undertook an intrusive investigation in two phases in July and September 2022. The site investigations included the following:

- Three window sample boreholes (designated WS2 to WS4 inclusive) were hand dug to a depth of 1.20m before window sampling commenced. The boreholes were drilled to a maximum depth of 3.00m bgl. SPTs were conducted and soil samples were collected and analysed for contamination and geotechnical properties. Soils were logged by an onsite geotechnical engineer.
- Nine trial pits (designated TP01 to TP09 inclusive) were excavated by use of a JCB 3CX to a maximum depth of 2.40m bgl. Soil samples were collected and analysed for contamination. Soils were logged by an onsite geotechnical engineer.
- Five of these trial pits were used for delineation around WS4, a previously identified contamination 'hotspot'. Samples labelled SP1-SP10 inclusive, were taken from trial pits TP05-TP09 inclusive for contamination testing. Soils were logged by an onsite geotechnical engineer.

The locations of the EEG Ltd exploratory holes are shown in Figures 3 and 4, below.

Figure 3: EEG Exploratory Hole Locations - WS Boreholes



Figure 4: EEG Exploratory Hole Locations - Trial Pit and Hotspot Sampling Location Plan



Ground Conditions

The recorded ground conditions are summarised as follows:

- **MADE GROUND** was encountered in all exploratory holes, comprising:
 - Grass over slightly gravelly SAND. Gravel is sandstone, red brick, slag, and glass.
 - Sandy gravelly CLAY. Gravel is sandstone, concrete, glass and red brick.
 - Gravelly SAND with rare cobbles. Cobble is red brick. Gravel is red brick, sandstone, glass, and rootlets.
 - Grass over slightly gravelly SAND. Gravel is sandstone, red brick, and glass.
 - Silty gravelly SAND. Gravel is red brick, concrete, sandstone and glass.
 - Concrete
 - SAND and GRAVEL with rare cobbles. Gravel is sandstone, red brick, concrete, glass, plastic, metal and ceramic tile.
 - Sandy GRAVEL. Gravel is concrete.
 - Gravelly CLAY. Gravel is sandstone.
- **CLAY** was encountered in exploratory holes WS2, WS3, WS4, TP01, TP02, TP03 and TP04, comprising:
 - Slightly silty slightly gravelly CLAY. Gravel is sandstone.
 - Slightly gravelly CLAY. Gravel is sandstone.
 - Dark brown sandy CLAY.
- **SAND** was encountered in WS3 only, comprising:
 - Light brown slightly clayey SAND.

Obstructions

No man-made obstructions or foundations were encountered in any of the window sample boreholes.

Observable Indications of Contamination

Gravel/cobbles of red brick, glass, concrete, plastic, metal and ceramic tile were observed in the Made Ground encountered on site, but these materials are generally considered inert.

However, rare gravel of slag was also encountered in the Made Ground.

No other visual or olfactory indications of contamination were observed.

Soil Contamination Assessment

Chemical analyses were carried out on four soil samples from the WS Exploratory Holes and were submitted for the following suite of determinants:

Asbestos Screen, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Vanadium, Zinc, Cyanide, Phenol, Sulphate (SO₄), Sulphide, pH, Soil Organic Matter,

Extractable Petroleum Hydrocarbons (EPH), Speciated Total Petroleum Hydrocarbons (TPH) and Speciated Polyaromatic Hydrocarbons (PAH).

Chemical analyses were also carried out on four soil samples from the Trial Pit Exploratory Holes from a return visit and were submitted for the same suite of determinants.

During the return visit, further testing was carried out to assess the spatial distribution of Speciated Polyaromatic Hydrocarbons (PAH) as part of a delineation around WS4; an identified naphthalene 'hotspot'.

The Phase II investigation identified elevated concentrations of contaminants in exceedance of screening criteria relevant to residential end use with plant uptake. The chemical exceedances in the WS Boreholes and Trial Pits included lead and several speciated PAHs, including Naphthalene, and are summarised in Table 1, below.

Below is a summary of the soil exceedances identified during the course of the previous site investigations. The C4SL/S4UL values have been derived using the average soil organic matter of the area tested. An average of 1% SOM was used in the SI report, but due to a higher average Soil Organic Matter observed, a more relevant assessment can be used.

Therefore, an average of 6% SOM can be used when comparing exceedance values in the northern part of the site (for samples from WS2-WS4 inclusive and SP1-SP10 inclusive) and an average of 2.5% can be used for the southern part of the site (for samples obtained from TP01-TP04 inclusive). This is presented in the following tables.

Table 1: Summary of Soil Contaminant Exceedances in EEG 2022 Site Investigation from Northern Part of the Site (WS Boreholes and Sampling Point Locations)

Contaminant	Location	Concentration (mg/kg)	C4SL/S4UL (mg/kg)
Lead	WS2 at 0.40m WS3 at 0.50m WS4 at 0.20m	290 - 493	200
Naphthalene	WS4 at 0.20m	82.3	13
Phenanthrene	WS4 at 0.20m	475	440
Benzo(a)anthracene	WS2 at 0.40m WS4 at 0.20m SP2, SP3, SP9	13.1 - 104	13
Chrysene	WS4 at 0.20m	91.6	27
Benzo(a)pyrene	WS2 at 0.40m WS3 at 0.50m WS4 at 0.20m SP1, SP2, SP3, SP4, SP6, SP8, SP9	5.27 – 85.4	5
Benzo(b)fluoranthene	WS2 at 0.40m WS3 at 0.50m WS4 at 0.20m SP1, SP2, SP3, SP4, SP5, SP6, SP7, SP8, SP9, SP10	3.71 - 91.2	3.7
Indeno(1,2,3-cd)pyrene	WS4 at 0.20m	48.7	41
Dibenz (a, h) anthracene	WS2 at 0.40m WS3 at 0.50m WS4 at 0.20m SP1, SP2, SP3, SP4, SP5, SP6, SP7, SP8, SP9, SP10	0.35 – 6.68	0.3

Table 2: Summary of Soil Contaminant Exceedances in EEG 2022 Site Investigation from Southern Part of the Site (Trial Pit Locations)

Contaminant	Location	Concentration (mg/kg)	C4SL/S4UL (mg/kg)
Lead	TP01 at 0.40m TP04 at 0.50m	364 - 502	200
Benzo(a)anthracene	TP01 at 0.40m TP04 at 0.50m	12.7 - 20.4	11
Benzo(a)pyrene	TP01 at 0.40m TP04 at 0.50m	9.69 - 13.9	5
Benzo(b)fluoranthene	TP01 at 0.40m TP04 at 0.50m	10.4 - 13.2	3.3
Dibenz (a, h) anthracene	TP01 at 0.40m TP02 at 0.15m TP04 at 0.50m	0.36 - 1.44	0.28

Due to the number and location of the contaminant exceedances it was deemed that the risk to residential (with plant uptake) end users was moderate. Therefore, it was recommended that pollutant linkages be broken by implementing a clean cover capping system in garden areas as well as removing the contaminated material from the naphthalene 'hotspot'. A remediation strategy was recommended to specify the design of the capping system an any following validation work.

4.0 LICENCES & APPROVALS

Various licences, permits and approvals are required at various stages before certain works can commence. Some activities can start before all such approvals are in place.

- (i) Approval of this Remediation Method Statement;
- (ii) All documentation in accordance with the CDM 2015 Regulations;
- (iii) General condition survey of boundary features
- (iv) A signed declaration by a qualified person of the Materials Management Plan (MMP) in accordance with CL: AIRE Waste Code of Practice, Version 2, March 2011. This would allow for reuse of excavated soils after demonstration of suitability for use.

5.0 PROPOSED WORKS

Aims

The remediation aims are to resolve contamination issues to protect human and environmental receptors and render the site suitable for the proposed end use.

Remediation aims are:

- Break-up of any remaining slabs and hardstanding.
- Segregation of Naphthalene contaminated material and removal offsite.
- Backfill of all resultant excavations with demonstrably suitable materials.
- Provision of 600mm clean cover system in soft landscaped areas.

The remediation strategy for the site has been developed after the completion of recent site investigations by Earth Environmental & Geotechnical Ltd in 2022.

Clean Cover Capping System – Specification

Due to the widespread nature of the contamination on the site, all areas of landscaping and garden areas will need to be capped with a suitable thickness of uncontaminated cover soils to break the potential contamination linkage, as follows:

-  A minimum total thickness of clean cover of 600mm should be placed in areas of proposed soft landscaping.
-  Clean cover may comprise a combination of subsoil and topsoil. Topsoil is to comprise no less than the upper 150mm. The material should ideally meet the requirement of BS3882:2015 Specification for topsoil.
-  A physical barrier should be present at the base of the capping system that will act as a no dig layer for future residents to prevent potential bioturbation

Clean Cover Capping System – Verification & Validation

Soils to be used as capping layers (site won or imported) must not contain contaminant concentrations above the assessment criteria for residential end use (with plant uptake) and be free of deleterious components e.g., glass, plastic, wood, ash, and metal solids.

Evidence will be required to demonstrate the suitability of the site won/imported materials to be used and that the capping has been installed in line with the specification outlined above. Validation will require:

-  Chemical analysis of soils will be carried out at source to ensure suitability for use, prior to being used/imported.
-  Relevant source test data for site won/imported soils will be provided to confirm all determinants are at concentrations below the relevant assessment criteria. Testing should be carried out at a frequency of **one sample per 100m³ batch of soil**.
-  Imported soils (if applicable) should be stockpiled on receipt and sampled from the stockpile prior to placement and undergo appropriate chemical analysis to confirm it is suitable for use.
-  Following confirmation that material is suitable for use, the material is to be placed in line with the above specification.
-  Following placement of clean cover system, trial holes will be formed in each area to confirm the correct implementation. Each pit will be inspected, photographed and the depths/thicknesses of the subsoil and topsoil measured by the consultant engineer.
-  A validation report will be provided for approval by the Environmental Health Contaminated Land Officer at the LA.

6.0 SITE WORKS

Outlined below are some of the main task and activities associated with the remediation works.

Site Organisation

Site works will be supervised throughout by a suitably qualified Engineer, who will report to a Project Manager. Supervision may be part-time for certain activities but will be full-time during the removal of any contaminated soil/fill and any placement of fill to an engineering specification.

Welfare Facilities/Security

Initial mobilisation works will include the establishment of appropriate office and welfare facilities. Such facilities may include but are not restricted to; office accommodation, canteen facilities, washroom/drying room, toilets, wheel wash, car parking, stores, and security unit.

The site should be secured by fencing to prevent unauthorised access onto the site during the enabling works.

Health & Safety

All site personnel will undergo a site-specific health and safety induction prior to commencement of work on site.

The Engineer will be informed prior to any proposed entry of a confined space or deep excavation. Entry will be restricted to suitably qualified and equipped personnel.

Works will be carried out about current statutory requirements and guidance by the Health & Safety Executive "Protection of workers and the general public during the redevelopment of contaminated land". Protective clothing, footwear and gloves will be required with hand washing and boot-washing facilities made available. Smoking will be limited to designated areas.

Site Clearance

The site should be cleared of all residual debris, vegetation, shrubs, bushes, and unprotected trees as instructed by the client.

With regards to invasive species (e.g., Japanese Knotweed) a specialist contractor should be employed to identify and remove such vegetation prior to any development taking place.

Removal of Existing Asphalt Hardstanding and Concrete

Existing areas of hardstanding will require removal to allow the development to be constructed. This material could be re-used appropriately onsite (subject to suitability of use) or removed off site in a controlled manner.

Unexpected Contamination

If during site clearance works or other excavations, material with visual or olfactory evidence of previously unrecorded contamination is encountered, the principal contractor should contact the environmental consultant.

These soils should be sampled, and chemical analysis carried out. The environmental consultant shall decide upon the chemical suitability of the material, to either remain on site or if it is likely to present a risk to receptors.

If the soils present a risk, the materials should be removed from site or remediated.

Any excavated material identified as potentially contaminated should be stockpiled on a non-permeable membrane, and tested for suitability for either re-use on site, or disposed offsite.

If prolonged stockpiling is unavoidable, these soils should be covered with a non-permeable membrane at the end of each working day, to prevent the possibility of leachate migrating from the soils due to infiltration.

Should the material be removed from site, waste acceptance criteria testing should be undertaken, and the material disposed of in a suitably licensed facility. The development of a Materials Management Plan (MMP) in line with the CL: AIRE Code of Practice may be required to remove or re-use soils.

Backfill of all Resultant Excavations with Demonstrably Suitable Materials.

All excavations must be backfilled with demonstrably suitable materials. Imported soils must be certified at source and onsite soils must be tested for suitability for re-use on site.

Provision of a Clean Growing Medium in Soft Landscaped Areas

Where areas of soft landscaping are proposed, a clean growing medium (i.e., topsoil) must be provided to a minimum thickness of 150mm.

The details for the 600mm clean cover capping system are outlined in section 5.0 above.

7.0 ENVIRONMENTAL MONITORING & CONTROLS

General

All works should be carried out in a manner that minimises impact on the environment and generates adequate and accurate records to demonstrate remediation works have been carried out to the required standard and in accordance with all applicable legislation. All such records should be collated on contract completion (or sooner as required) and included within the contract completion report. Appropriate progress reports should be provided in a format and at a frequency as agreed with the client and project manager including on-going monitoring/validation information.

Comprehensive records should be maintained throughout the project. These should be collated on contract completion into a completion and validation report, which should be submitted to the appropriate regulators for approval. It will be presented in an appropriate manner to allow interested third parties to fully understand the whole remediation process.

The records should include correspondence with the regulators & other third parties, environmental monitoring data, validation testing, comprehensive as-built drawings, photographs, collation of all site investigation reports, operational method statements & risk assessments, construction phase health & safety plan and confirmation of post remediation considerations especially in respect of interaction with initial construction (groundwork's).

Noise Control

Earthworks will only take place during normal working hours 7.00am – 6.00pm Monday to Friday and 8.00am to 13:00pm on Saturdays with no working on Sundays or Bank Holidays. The site manager shall assess noise and its impact upon neighbours through the working day and to ensure the following mitigation measures are being utilised:

All plant and machinery will be fitted with adequate silencers and will not be operated unless in good condition.

Noise levels will be as per normal for a project of this nature. Pneumatic breakers will be used but location and hours of use controlled whenever possible.

Should residents make any complaints regarding noise associated with the works, the site manager shall investigate. Such investigation may include the use of portable monitoring equipment to record noise levels at the location of the complainant. The nature of the complaint and findings of the investigation shall be discussed with the local EHO. If the complaint is upheld appropriate remedial action shall be taken. Such action may include the adjustment of working hours or the alteration of site practices and working methods.

Odour Control

Works may produce odours, but good site practice and associated mitigation measures should ensure fugitive odours are kept to an absolute minimum. Such controls may include:

- Additional covers will be applied to stockpiles if they are contributing to fugitive odours.

- Areas of excavation i.e., area of exposed contaminated soils, will be kept to a minimum and covered/re-instated as soon as is practicably possible.
- Odour suppressing equipment shall be utilised at appropriate locations at appropriate times.

If a complaint is made regarding odours from nearby residents, the site manager shall respond by attending the complainant's property to assess the nature and level of odour nuisance including monitoring where appropriate. Appropriate mitigation measures as described herein shall then be enforced including, if necessary, suspension of excavation works until the prevailing weather conditions become more favourable.

Dust Control

Earthworks may produce dust during prolonged periods of dry weather. The site manager shall assess dust and its impact upon neighbours through the working day and ensure the following mitigation measures are being utilised to control dust:

- The use and maintenance of good quality site roads;
- Enforcing speed limits of site plant and;
- Dust suppression via water applied by towed bowser

8.0 OTHER CONSIDERATIONS

Material Management Plan

The development of a Materials Management Plan (MMP) in line with the CL: AIRE Code of Practice may be required to re-use or remove onsite soils.

The development of an MMP will require a Cut and Fill model to identify the sources of and possible destinations for site-won materials. In respect of re-using site won soils, formation levels should be designed to accommodate the required thickness of clean cover soils in garden/landscaped areas, without the requirement for offsite disposal of significant soil quantities.

Waste Soils

Waste Acceptance Criteria testing should be undertaken to ensure that the materials to be disposed of off-site are received by a suitably licensed facility. Chemical testing should be completed by a reputable laboratory with MCERTS accreditation prior to making disposal arrangements.

Where excess soils require off-site disposal, the materials need to be managed under the appropriate legislation e.g., MMP.

9.0 VALIDATION REPORT

A validation report would be developed for the site which would detail the following:

- Thickness of clean cover capping system used in soft landscaped areas
- Chemical testing of imported material used as the cover system
- Removal offsite of naphthalene contaminated soils

The report would be provided to the local authority for the discharging of relevant planning conditions.

APPENDIX 1

EEG GEOENVIRONMENTAL SITE INVESTIGATION (2022)

APPENDIX 2

ASSESSMENT CRITERIA FOR CLEAN COVER SYSTEM

Assessment Criteria Based on Residential with Homegrown Produce End Use

Inorganic Compounds	Assessment Criteria - Residential with Homegrown Produce (mg/kg)		
Arsenic	37		
Cadmium	11		
Chromium (III)	910		
Chromium (VI)	6		
Lead	200		
Mercury	1.2		
Nickel	180		
Selenium	250		
Copper	2400		
Zinc	3700		
Organic Compounds	1% SOM	2.5% SOM	6% SOM
Naphthalene	2.3	5.6	13
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Fluorene	170	400	860
Phenanthrene	95	220	440
Anthracene	2400	5400	11000
Fluoranthene	280	560	890
Pyrene	620	1200	2000
Benzo(a)anthracene	7.2	11	13
Chrysene	15	22	27
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(k)fluoranthene	77	93	100
Benzo(a)pyrene	2.2	2.7	3.0
Dibenz (a, h) anthracene	0.24	0.28	0.3
Indeno(1,2,3-cd) pyrene	27	36	41
Benzo (g, h, i) perylene	320	340	350
Benzene	0.087	0.17	0.37
Toluene	130	290	660
Ethylbenzene	47	110	260
o-Xylene	60	140	330
m-Xylene	59	140	320
p-Xylene	56	130	310
TPH Fractions	1% SOM	2.5% SOM	6% SOM
Aliphatic EC 5-6	42	78	160
Aliphatic EC >6-8	100	230	530
Aliphatic EC >8-10	27	65	150
Aliphatic EC >10-12	130 (48) ^{vap}	330 (118) ^{vap}	760 (283) ^{vap}
Aliphatic EC >12-16	1100 (24) ^{sol}	2400 (59) ^{sol}	4,300 (142) ^{sol}
Aliphatic EC >16-35	65,000 (8.48) ^{f, sol}	92,000 (21) ^{f, sol}	110,000 ^f
Aliphatic EC >35-44	65,000 (8.48) ^{f, sol}	92,000 (21) ^{f, sol}	110,000 ^f
Aromatic EC 5-7	70	140	300
Aromatic EC >7-8	130	290	660

	Assessment Criteria - Residential with Homegrown Produce (mg/kg)		
TPH Fractions	1% SOM	2.5% SOM	6% SOM
Aromatic EC >8-10	34	83	190
Aromatic EC >10-12	74	180	380
Aromatic EC >12-16	140	330	660
Aromatic EC >16-21	260 ^f	540 ^f	930 ^f
Aromatic EC >21-35	1,100 ^f	1,500 ^f	1,700 ^f
Aromatic EC >35-44	1,100 ^f	1,500 ^f	1,700 ^f
Asbestos Fibres	< 0.001%		

The site-specific risk-based criteria are based upon DEFRA/EA CLEA modelling assuming a sandy loam with 1% Soil Organic Matter and pH of 7.

Purpose	Classification	Testing Frequency	Chemical Analysis
Source Testing & Suitability For Use	Topsoil	1 sample per 50m ³ [Minimum of 3 per source]	➤ Inorganic Compounds; ➤ Speciated Polycyclic Aromatic Hydrocarbons; ➤ Speciated Petroleum hydrocarbons; ➤ Asbestos Identification.
	Sub-Soil	1 sample per 250m ³ [Minimum of 3 per source]	
Validation Testing	Topsoil	1 sample per 3 plots	
	Sub-Soil	1 sample per 3 plots	

The sampling frequency for materials intended for gardens is to be managed under the Remediation Strategy

APPENDIX 3

REPORT LIMITATIONS

LIMITATIONS

This contract was completed by Earth Environmental & Geotechnical Ltd based on a defined programme and scope of works and terms and conditions agreed with the client. This report was compiled with all reasonable skill, and care, bearing in mind the project objectives, the agreed scope of works, the prevailing site conditions, the budget, and staff resources allocated to the project.

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If a third party relies on this report, it does so wholly at its own and sole risk and Earth Environmental & Geotechnical Ltd disclaims any liability to such parties.

It is Earth Environmental & Geotechnical Ltd understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was an important factor in determining the scope and level of the services. Should the purpose for which the report is used, or the proposed use of the site change, this report will no longer be valid and any further use of, or reliance upon the report in those circumstances by the client without Earth Environmental & Geotechnical Ltd review and advice shall be at the client's sole and own risk.

The report was written in 2022 and should be read considering any subsequent changes in legislation, statutory requirements, and industry best practices. Ground conditions can also change over time and further investigations, or assessment should be made if there is any significant delay in acting on the findings of this report. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of Earth Environmental & Geotechnical Ltd. In the absence of such written advice of Earth Environmental & Geotechnical Ltd, reliance on the report in the future shall be at the client's own and sole risk. Should Earth Environmental & Geotechnical Ltd be requested to review the report in the future, Earth Environmental & Geotechnical Ltd shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between Earth Environmental & Geotechnical Ltd and the client.

The observations and conclusions described in this report are based solely upon the services that were provided pursuant to the agreement between the client and Earth Environmental & Geotechnical Ltd. Earth Environmental & Geotechnical Ltd has not performed any observations, investigations, studies or testing not specifically set out or mentioned within this report.

Earth Environmental & Geotechnical Ltd is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, Earth Environmental & Geotechnical Ltd did not seek to evaluate the presence on or off the site of electromagnetic fields, lead paint, radon gas or other radioactive materials.

The services are based upon Earth Environmental & Geotechnical Ltd observations of existing physical conditions at the site gained from a walkover survey of the site together with Earth Environmental & Geotechnical Ltd interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The findings and recommendations contained in this report are based in part upon information provided by third parties, and whilst Earth Environmental & Geotechnical Ltd have no reason to doubt the accuracy and that it has been provided in full of those it was requested from, the items relied on have not been verified.

No responsibility can be accepted for errors within third party items presented in this report. Further Earth Environmental & Geotechnical Ltd was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the services. Earth Environmental & Geotechnical Ltd is not liable for any inaccurate information, misrepresentation of data or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to Earth Environmental & Geotechnical Ltd and including the doing of any independent investigation of the information provided to Earth Environmental & Geotechnical Ltd save as otherwise provided in the terms of the contract between the client and Earth Environmental & Geotechnical Ltd.

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable and as investigation excavations only allow examination of the ground at discrete locations. The potential exists for ground conditions to be encountered which are different to those considered in this report. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and Earth Environmental & Geotechnical Ltd] based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.

The groundwater conditions entered on the exploratory hole records are those observed at the time of investigation. The normal speed of investigation usually does not permit the recording of an equilibrium water level for any one water strike. Moreover, groundwater levels are subject to seasonal variation or changes in local drainage conditions and higher groundwater levels may occur at other times of the year than were recorded during this investigation.

Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site.