



SOLUTIONS LIMITED

**VALIDATION REPORT
FOR 27-29 TRENCHARD DRIVE,
WYTHENSHAW, MANCHESTER**

**FOR
KANSHO PROPERTY SERVICES LTD**

Report Reference:

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QUALITY ASSURANCE

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LIST OF ACRONYMS

Acronym	Meaning
BGS	British Geological Survey
BH	Borehole
CDM	Construction Design and Management
CL:AIRE	Contaminated Land: Applications In Real Environments
CLR	Contaminated Land Report
COSHH	Control Of Substances Hazardous to Health
CSM	Conceptual Site Model
DCP	Dynamic Cone Penetrometer
DEFRA	Department for Environment Foods and Rural Affairs
DoE	Department of Environment
DP	Dynamic Probe
DWS	Drinking Water Standard
EA	Environment Agency
EQS	Environmental Quality Standard
GAC	Generic Acceptance Criteria
HA	Hand Auger
HP	Hand Pit
LPA	Local Planning Authority
LQM	Land Quality Management
mbgl	Metres Below Ground Level
MP	Mackintosh Probe
NGR	National Grid Reference
NPPF	National Planning Policy Framework
OS	Ordnance Survey
SGV	Soil Guideline Value
SPOSH	Significant Possibility of Significant Harm
SPT	Standard Penetration Test
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SSV	Soil Screening Value
TP	Trial Pit
TT	Trial Trench
WS	Windowless Sample / Window Sample
WSV	Water Screening Value

1. INTRODUCTION

1.1 BACKGROUND AND INSTRUCTION

GeoEnviro Solutions Ltd (GES) was instructed by Kansho Property Services Ltd (the Client) to conduct a Remedial Strategy at the proposed 27-29 Trenchard Drive, Wythenshaw.

GES were instructed to undertake a validation report for the remediation undertaken as part of the development. A remediation strategy was provided by the client. The report was compiled by Worms Eye in report ref: Trenchard Road / M22 5LZ . Salient details of these reports are summarised in Section 2.

1.2 PARTIES TO THE PROPOSED WORKS

The principal parties to the remediation and engineering works include:

- Kansho Property Ltd.
- Worms Eye.
- Stroma Building Control.
- ABC+ Warranty

1.3 PLANNING CONDITION

Planning permission (ref: 126435/FO/2020) has been granted for the above site. This report makes reference to a number of conditions outlined in the planning permission; a copy of the planning conditions is included within [Appendix 1](#)

1.4 PREVIOUS INVESTIGATIONS

Previous assessments conducted at the site comprise the following:

- Phase II
- Ground Gas Risk Assessment
- Worms Eye report dated 25th March 2020, referenced Trenchard Road / M22 5LZ / 2020 and entitled 'Intrusive Report'.

2. SITE SETTING

2.1 SITE INFORMATION

Location

The site is located at 27-29 Trenchard Road, Trenchard Drive, Moss Nook, Manchester, M22 5LZ, at approximate National Grid Reference NGR: 383893, 385454 (centre of the site).

3. FIELDWORKS

3.1 GROUND INVESTIGATION

All ground investigation works were completed from November the 11th 2024 under the supervision of a Geoenvironmental Engineer from GES.

The ground investigation has been carried out in accordance with BS5930: 2015+A1:2020 and the UK Specification for Ground Investigation Second Edition 2012.

All strata descriptions were undertaken in accordance with BS5930: 2015+A1:2020; EN ISO 14688-1&2:2018; and EN ISO 14689:2018.

Six trial pits were undertaken in the garden areas.

The positions of the exploratory holes in relation to the existing site layout can be reviewed on drawings 5210-24 / 01 which shows the locations of the trial pits, within [Appendix 1](#).

3.2 RESTRICTIONS

No restrictions were encountered during this ground investigation.

4. ENCOUNTERED GROUND CONDITIONS

The following ground conditions were encountered during the ground investigation.

4.1 GENERAL

Detailed strata descriptions are presented on the exploratory point logs presented in [Appendix 2](#).

4.2 MADE GROUND

Across the garden area between 30mm to 80mm of turf and topsoil was noted. This was found to overlie generally gravelly sands. The gravel was noted to comprise brick, concrete, ceramic and some plastic materials. These deposits were noted to present to depths between 300mm to in excess of 600mm bgl.

Upon penetrating these soils in TP01 to TP04 and TP06 natural soils were recorded comprising gravelly Sand deposits.

4.3 OBSTRUCTIONS

No obstructions were encountered during this ground investigation.

5. LABORATORY TESTING – CONTAMINATION

5.1 SOIL TESTING

All samples were sent to a UKAS accredited chemical testing laboratory, and MCERTS were used where available. The analytical strategy focussed on a general suite of potential contaminants and the analytical suites are summarised in Table 5.1, below.

Table 5.1: Summary of Chemical Testing Suite

Testing	Comment	No. of soil samples analysed
General metals suite including Arsenic, cadmium, chromium, copper, cyanide, lead, mercury, nickel, phenol, selenium, zinc, pH, and water soluble sulphate	General analysis of soils.	6
Speciated PAH and TPH CWG	General analysis of soils.	6
Asbestos Screen	General analysis of soils.	6

All chemical testing results are presented in [Appendix 3](#).

6. CONTAMINATION

6.1 SOIL TESTING

A total of six samples have been selected and analysed by Chemtech Ltd in their UKAS and MCERTS accredited laboratory-testing facility in accordance with laboratory protocol.

The testing completed comprised of a focused suite of heavy metals, speciated Total Petroleum Hydrocarbons (TPH CWG Aromatic/aliphatic split) and speciated Polycyclic Aromatic Hydrocarbons (PAH) including the more carcinogenic benzo(a)pyrene (BaP) and naphthalene, asbestos, soil organic matter (SOM) content, MTBE & BTEX, cyanide, pH and sulphates.

The results of this laboratory testing have been compared to the Soil Guideline Values (SGVs) as well as the CIEH 'LQM' guideline values for inorganic and organic contaminants in soils. The greater site area comprises of commercial use and therefore screening has been made against a land use of 'Residential with plant uptake'.

A set of Screening Values are provided in [Appendix 5](#).

Contaminants have been screened against revised LQM/CIEH S4UL criteria¹ where available. These GAC have been designed for use under planning, using Health Criteria Values based on minimal risk, and updated exposure parameters. The S4UL are intended to replace the previous LQM/CIEH GAC. The S4UL are based on the assumption of a sandy loam soil the 6% soil organic matter (SOM) criteria have been used, where available and appropriate, in the first instance. All soil samples were analysed for %SOM, the range was from 2-9.7%, and so this conservative approach is considered appropriate for initial screening.

Where no S4UL are available, the EIC/ AGS/ CL:AIRE/ GAC² have been used. The toxicological criteria within these are also based on minimal risk. It is recognised that these criteria have not recently been updated, and in particular, do not incorporate the slightly higher inhalation rates that have been used within the S4UL. However, given that they incorporate additional pathways, they are considered suitable for an initial screen. The EIC/ AGS/ CL:AIRE/ GAC are also based on a sandy loam soil and the 6% SOM criteria have been used in the first instance.

There is neither an S4UL nor an EIC/ AGS/ CL:AIRE/ GAC available for lead. In the absence of a GAC based on minimal risk, the C4SL for lead has been used. It is recognised that this is based on a "low level of toxicological concern" rather than on a minimal risk level. However, it is considered appropriate for use under planning, especially for a site where there will effectively be no pathways for inorganic metals following redevelopment.

All the GAC are based on a sandy loam soil. This is considered appropriate for use for initial screening. Although it is apparent from the laboratory soil descriptions, that the Made Ground, by its very nature is heterogeneous, and often has a significant sand/gravel component, especially at shallow depths, it is noted that many of the soil descriptions have a significant clay component.

All of the GAC assume unsaturated soils. However, the use of the GAC is considered to be conservative, because they assume a certain air-filled porosity and water-filled porosity.

¹ Nathanail et al. (2015) The LQM/CIEH S4ULs for Human Health Risk Assessment. Land Quality Press, 2015. Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3495

² CL:AIRE (2010) The EIC/AGS/CL:AIRE Generic Assessment Criteria for Human Health Risk Assessment

The GAC also assume that no free phase product is present and are not intended for use in this instance. No free product was observed within soils during the ground investigation.

6.2 SOIL TESTING RESULTS AND SCREENING

All metals, PAHs, and TPH CWG analytes are presented in the following tables with units in mg/kg unless otherwise stated. Other potential contaminants of concern are only shown where there is at least one result exceeding the limit of detection.

The results of the chemical laboratory testing are provided in [Appendix 4](#).

Tables 10.1 – 10.3 below and overleaf summarize the soil testing results.

Metalloids

Table 10.1: Metalloids Soil Exceedances

Determinant	Min	Max	GAC	Number of exceedances	Location of exceedances
Arsenic	8.8	20.1	37	0	-
Cadmium	<1.6	<1.6	11	0	-
Chromium total	15.4	22.9	910	0	-
Chromium (VI)	<0.04	<0.04	6	0	-
Copper	30.9	66.4	2400	0	-
Lead	629.0	147.0	200	1	TP01
Mercury	<0.7	<0.7	1.2	0	-
Nickel	12.6	24.5	180	0	-
Selenium	<3	<3	250	0	-
Zinc	79.2	288	3700	0	-
Total Phenols	<0.5	<0.5	550	0	-
Total Cyanide	<1	<1	34	0	-

*LQM/CIEH GAC for 'Residential with' use scenario based on a sandy loam soil and 6% SOM.

a) Based on the inorganic mercury GAC as the conceptual site model does not suggest that other forms of mercury are likely to be present on site.

b) LQM issued an update to the nickel S4ULs in August 2015, and this has been taken into account.

Organics

Table 10.2: PAH Soil Exceedances

Determinant	Min	Max	GAC	Number of exceedances	Location of exceedances
Naphthalene	<0.016	0.1	13	0	-
Acenaphthylene	<0.015	0.67	920	0	-
Acenaphthene	<0.013	0.124	100	0	-
Fluorene	<0.013	0.101	860	0	-
Phenanthrene	<0.013	1.790	440	0	-
Anthracene	<0.017	0.387	1100	0	-
Fluoranthene	<0.017	3.60	890	0	-

Determinant	Min	Max	GAC	Number of exceedances	Location of exceedances
Pyrene	<0.016	3.120	2000	0	-
Benzo(a)anthracene	<0.012	1.560	13	0	-
Chrysene	<0.028	1.660	27	0	-
Benzo(b)fluoranthene	<0.020	1.90	3.7	0	-
Benzo(k)fluoranthene	<0.025	0.710	100	0	-
Benzo(a)pyrene	<0.019	1.670	3	0	-
Indeno(1,2,3-cd)pyrene	<0.019	0.990	41	0	-
Dibenz(a,h)anthracene	<0.017	0.242	0.3	0	-
Benzo(ghi)perylene	<0.019	1.120	350	0	-

*LQM/CIEH GAC for 'Residential with' use scenario based on a sandy loam soil and 6% SOM.

Table 10.3: TPH CWG Aliphatic/Aromatic Soil Exceedances

Determinant	Min	Max	GAC	Number of exceedances	Location of exceedances
Aromatic >C5 - C7	<0.010	<0.010	300	0	-
Aromatic >C7 - C8	<0.010	<0.010	660	0	-
Aromatic >C8 - C10	<0.010	<0.010	190	0	-
Aromatic >C10 - C12	<1.0	<1.0	380	0	-
Aromatic >C12 - C16	<1	36	660	0	-
Aromatic >C16 - C21	<1.5	231	930	0	-
Aromatic >C21 - C35	11	71.4	1700	0	-
Aromatic >C35 - C44	3.1	17.4	1700	0	-
Aliphatic >C5 - C6	<0.10	<0.10	160	0	-
Aliphatic >C6 - C8	<0.10	<0.05	530	0	-
Aliphatic >C8 - C10	<0.010	<0.010	150	0	-
Aliphatic >C10 - C12	<1	<1	760	0	-
Aliphatic >C12 - C16	<0.5	0.8	4300	0	-
Aliphatic >C16 - C35	<4.7	35.3	11000	0	-
Aliphatic >C35-C44	<0.5	10.1	11000	0	-

*LQM/CIEH GAC scenario based on a sandy loam soil and 6% SOM. It is noted that the LQM/CIEH S4UL guidance recommends an additive approach for the TPH fraction, so that a hazard index approach is used. Based on a preliminary conservative comparison of maximum concentrations to S4ULs, no forward modelling is necessary to prove that this would still result in no exceedances at the site.

Others

The results of the testing indicated no asbestos present.

7. CONCLUSIONS

The target remediation is recommend as being 600mm within the made ground soils from the remediation strategy report. It can be seen that the depth of imported material varied between 300mm to 600mm with natural soils revealed in these areas of reduced cover, therefore it is considered sufficient cover has been placed. Its should be appreciated that the cover material comprised multiple anthropogenic materials. The results of the chemical testing were compared against the values for residential with plant uptake for 6% SOM as suggested by the testing and is considered appropriate. The results suggest that the material is generally clean with the exception of 1 value for Lead in TP01. In view of the high value and shallow depth it is recommended that further work would be required to delineate and remove this hot spot of elevated lead contamination.

2. RELIANCE AND LIMITATIONS

This report has been prepared using published information and information provided by the Client and their professional advisers which has been made available to GES at the time of writing only. GES accepts no liability for any changes resulting from new information which has become available since this time.

This report is provided for the sole use of the client and their professional advisers and is confidential to them unless agreed otherwise in writing. This report may only be used and relied on once the work has been paid for in full. GES owes no duty of care and has no liability to any third party who is not authorised by GES to use this report. Any unauthorised third parties using information contained in this report do so at their own risk.

We are content that as a result of the site investigation works and subsequent soil testing undertaken, as outlined within this report, we have characterised the ground conditions and consequently the potential for contamination to exist on site. These works and ensuing assessment have been detailed in this report.

This assessment has been carried out to determine the potential risks posed to future end users, along with other key receptors, resulting from potential contamination at the site, based on the proposed development. Should any revisions in the development proposals result in a change any assessment parameters detailed in this report, a re-assessment of the risk should be carried out.

Whilst this report may reference observations made regarding the presence of features/ issues such as invasive species, ACM, site drainage and evidence of structural abnormalities, this report does not constitute specialist surveys on these matters. Should further specialist surveys be carried out in this regard, the findings of these should be reported to GES so that we may determine if this has any impact on the findings of this report.

The assessment and interpretation of the factual data obtained as part of this site investigation has been undertaken in accordance with standard consulting practise and with current national and international guidance.

This report presents the observations made during the site investigation and the factual data obtained. The conclusions and recommendations in this report are limited to those which can be made based on the findings of the survey and information provided by third parties. GES assumes all third party data to be true and correct. No responsibility can be accepted by GES for inaccuracies in the information provided by any other party.

This report is written in the context of an agreed scope of works and should not be used in a different context. Furthermore, new information, improved practises, and changes in legislation may require the reinterpretation of the report in whole or in part after its original issue. GES reserve the right to alter their conclusions and recommendations in the light of further information that may become available.

Ground conditions can be variable and change rapidly, especially in areas of Made Ground, however it is assumed that the ground conditions encountered and observed are typical and representative of the site as a whole. Most specifically with regard to this limited investigation, the ground conditions have been determined from a limited number of exploratory holes formed across the site, therefore only a small percentage of the total area of the site has been investigated. Interpolation between exploratory holes has enabled a general picture of the subsurface conditions to be produced. Conclusions drawn from the ground investigation should be read in this context. GES cannot accept responsibility for any situations resulting from locally unforeseen ground conditions occurring between exploratory holes.

In addition, subsurface conditions including contaminant concentrations and groundwater levels may vary spatially with time. This factor should be given due consideration in the event that the information contained within this report is used after any significant period of time has elapsed.

APPENDIX 1
DRAWINGS AND PLANS

Important – Planning permission & notices of consent

Compliance with conditions

- Your planning approval or consent is attached. It will contain conditions that you must comply with.
- Please read the conditions and understand their requirements and restrictions, for example submission and approval of details or measures to protect trees.
- Some conditions will require action before you start development and it is imperative that you seek to have these discharged before any work commences.
- Whilst every effort has been made to group conditions logically, it is your responsibility to ensure that you are aware of the requirements and/or restrictions of all conditions.
- If you fail to comply with the conditions this may result in a breach of planning control and this may lead to enforcement action.
- Failure to comply with conditions may also result in the development not being lawful.
- It is in your interests to demonstrate that conditions have been complied with. Failure to do so may cause difficulties if the property is sold or transferred.
- A fee is payable for each request to discharge conditions.
- For advice on any of these matters, please contact Planning, Manchester City Council, PO Box 532, Town Hall, Manchester M60 2LA or email planning@manchester.gov.uk

Town & Country Planning Act 1990 (as amended)

Planning Permission

Applicant

Mr Kanwarpreet Singh
17 Wood Road
Sale
M33 3RS

Agent (if used)

Mr DK Seddon
Howard & Seddon ARIBA
64 Washway Road
M33 7RE

Part 1 – Particulars of the application/development

Proposal: Conversion of the existing dwelling to create 2 no. three bedroom dwellings; and the erection of 2no. 4 bedroom dwellings with associated car parking and landscaping

Location: 27 Trenchard Drive, Manchester, M22 5LZ

Date of application: 1 April 2020

Application number: 126435/FO/2020

Part 2 – Particulars of decision

Manchester City Council gives notice that the development referred to in Part 1 has been **Approved** in accordance with the application and plans submitted subject to the condition(s) listed below (if any).

Article 35 Declaration

Officers have worked with the applicant in a positive and proactive manner to resolve any problems arising in relation to dealing with the planning application.

Condition(s) attached to this decision

1) The development must be begun not later than the expiration of three years beginning with the date of this permission.

Reason - Required to be imposed pursuant to Section 91 of the Town and Country Planning Act 1990.

2) The development hereby approved shall be carried out in accordance with the following drawings and documents:

- a) Drawing no.13673/OS, stamped as received on 6 March 2020
- b) Drawing no. 01, stamped as received on 6 March 2020
- c) Drawing no. 02, stamped as received on 6 March 2020
- d) Drawing no. 05c, stamped as received on 4 August 2020

- e) Drawing no. 07b, stamped as received on 13 August 2020
- f) Drawing no. 08b, stamped as received on 13 August 2020
- g) Drawing no. 09a, stamped as received on 9 July 2020

Reason - To ensure that the development is carried out in accordance with the approved plans. Pursuant to policies SP1 and DM1 of the Core Strategy.

3) Above-ground construction works shall not commence until samples and specifications of all materials, including window frames, to be used in the external elevations have been submitted to and approved in writing by the City Council as local planning authority. Thereafter the development shall be carried out in accordance with those details.

Reason - To ensure that the appearance of the development is acceptable to the City Council as local planning authority in the interests of the visual amenity of the area within which the site is located, as specified in policies SP1 and DM1 of the Manchester Core Strategy (2012).

4) Notwithstanding the provisions of the Town and Country Planning (General Permitted Development) Order 2015 or any order revoking and re-enacting that Order with or without modification) no part of any dwelling shall be used for any other purpose (including any other purpose in Class C3 of the Schedule to the Town and Country Planning (Use Classes) Order 1987 as amended by The Town and Country Planning (Use Classes) (Amendment) (England) Order 2010, or in any provision equivalent to that Class in any statutory instrument revoking and re-enacting that Order with or without modification) other than the purpose(s) of C3(a).

Reason - In the exceptional circumstances of a proliferation of HMO's restricting housing choice and adversely affecting sustainability and in the interests of residential amenity, to safeguard the character of the area and to maintain the sustainability of the local community through provision of accommodation that is suitable for people living as families pursuant to policy 7.4 of the Guide to Development in Manchester: Supplementary Planning Document and Planning Guidance, the National Planning Policy Framework and policies SP1, H7, H8 and DM1 of the Manchester Core Strategy (2012).

5) Above-ground construction works shall not commence until details of the measures to be incorporated into the development (or phase thereof) to demonstrate how Secured by Design accreditation will be achieved have been submitted to and approved in writing by the City Council as local planning authority. The development shall only be carried out in accordance with these approved details. The development hereby approved shall not be occupied or used until the Council as local planning authority has acknowledged in writing that it has received written confirmation of a Secured by Design accreditation.

Reason - To reduce the risk of crime pursuant to policies SP1 and DM1 of the Manchester Core Strategy (2012) and to reflect the guidance contained in the National Planning Policy Framework.

6) Before the development commences a scheme for acoustically insulating the proposed residential accommodation against noise from the local road network and Manchester Airport shall be submitted to and approved in writing by the City Council as local planning authority. There may be other actual or potential sources of noise which require consideration on or near the site, including any local commercial/industrial

premises. The approved noise insulation scheme shall be completed before any of the dwelling units are occupied.

Upon completion of the development and before first occupation of the residential units, a verification report will be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant's report. The report shall also undertake post completion testing to confirm that the internal noise criteria has been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the internal noise criteria.

Reason - To secure a reduction in noise from traffic or other sources in order to protect future residents from noise disturbance, pursuant to Policy DM1 in the Manchester Core Strategy.

7) The development shall not commence until a scheme for the investigation of the site and the identification of remediation measures (the Site Investigation Proposal) has been submitted to and approved in writing by the City Council as local planning authority.

The measures for investigating the site identified in the Site Investigation Proposal shall be carried out, before development commences and a report prepared outlining what measures, if any, are required to remediate the land (the Site Investigation Report and/or Remediation Strategy) which shall be submitted to and approved in writing by the City Council as local planning authority.

In the event that ground contamination, groundwater contamination and/or ground gas, not previously identified, are found to be present on the site at any time before the development in each phase is occupied, then development shall cease and/or the development shall not be occupied until, a report outlining what measures, if any, are required to remediate the land (the Revised Remediation Strategy) is submitted to and approved in writing by the City Council as local planning authority and the development shall be carried out in accordance with the Revised Remediation Strategy, which shall take precedence over any Remediation Strategy or earlier Revised Remediation Strategy.

Reason - To ensure that the presence of or the potential for any contaminated land and/or groundwater is detected and appropriate remedial action is taken in the interests of public safety, pursuant to policies DM1 and EN18 of the Manchester Core Strategy.

8) Prior to the occupation of the development hereby approved, a Contaminated Land Verification Report shall be submitted to the City Council as local planning authority.

Reason - To confirm that appropriate remedial action has been taken in the interests of public safety, pursuant to policies DM1 and EN18 of the Manchester Core Strategy.

9) The storage and disposal of waste shall be undertaken in accordance with the Waste Management Strategy stamped as received on 23 March 2020 and shall remain in situ whilst the development is in operation.

Reason - In the interests of visual and residential amenity, pursuant to Policy DM1 in the Manchester Core Strategy.

10) The car parking spaces hereby approved shall be laid out and made available for use before first occupation of the dwellinghouses. The car parking spaces shall remain in-situ for the duration of the development

Reason - In the interests of residential amenity and pedestrian and highway safety, pursuant to Policy DM1 in the Manchester Core Strategy.

11) No removal of or works to any hedgerows, trees or shrubs shall take place during the main bird breeding season 1st March and 31st July inclusive, unless a competent ecologist has undertaken a careful, detailed check of vegetation for active birds' nests immediately before the vegetation is cleared and provided written confirmation that no birds will be harmed and/or that there are appropriate measures in place to protect nesting bird interest on site. Any such written confirmation should be submitted to the local planning authority.

Reason - To ensure the protection of habitat of species that are protected under the Wildlife and Countryside Act 1981 or as subsequently amended in order to comply with policy EN15 of the Core Strategy.

12) Above grounds works shall not commence until details of biodiversity enhancements (bird boxes and bat bricks), including a timetable for their installation and maintenance regime, have been submitted to and been approved by the City Council as local planning authority. The development shall be carried out in accordance with the agreed details.

Reason - To ensure the protection of habitat of species that are protected under the Wildlife and Countryside Act 1981 or as subsequently amended in order to comply with policy EN15 of the Core Strategy Development Plan Document

13) Above grounds works shall not commence until a hard and soft landscaping treatment scheme has been submitted to and approved in writing by the City Council as local planning authority. The approved scheme shall be implemented not later than 12 months from the date the buildings are first occupied. If within a period of 5 years from the date of the planting of any tree or shrub, that tree or shrub or any tree or shrub planted in replacement for it, is removed, uprooted or destroyed or dies, or becomes, in the opinion of the local planning authority, seriously damaged or defective, another tree or shrub of the same species and size as that originally planted shall be planted at the same place.

Reason - To ensure that a satisfactory landscaping scheme for the development is carried out that respects the character and visual amenities of the area, in accordance with policies SP1, EN9 and DM1 of the Manchester Core Strategy.

14) No development hereby permitted shall be occupied until details of the implementation, maintenance and management of the sustainable drainage scheme have been submitted to and approved by the local planning authority. The scheme shall be implemented and thereafter managed and maintained in accordance with the approved details.

Reason: To manage flooding and pollution and to ensure that a managing body is in place for the sustainable drainage system and there is funding and maintenance mechanism for the lifetime of the development, pursuant to Policy DM1 in the Core Strategy Development Plan Document and the policies and guidance within the NPPF and NPPG

15) The development hereby approved shall be implemented in full accordance with the measures as set out within the Environmental Statement, stamped as received by the City Council as local planning authority on 23 March 2020. Within 3 months of the completion of the construction of the authorised development a verification statement shall be submitted to and approved in writing, by the City Council as local planning authority, confirming the incorporation of the specified measures at each phase of the construction of the development, including dated photographic documentary evidence of the implementation and completion of required works.

Reason - In order to minimise the environmental impact of the development pursuant to policies SP1, T1-T3, EN4-EN7 and DM1 of the Core Strategy for the City of Manchester and the principles contained within The Guide to Development in Manchester SPD (2007) and the National Planning Policy Framework.

16) No above ground works associated with the four dwellinghouses hereby permitted shall commence until the existing house known as 25 Trenchard Drive has been demolished in full in accordance with the drawing no. 08b, stamped as received on 13 August 2020, and the Design and Access Statement, stamped as received on 1 April 2020.

Reason - In the interests of residential amenity and to prevent the overdevelopment of the site, pursuant to Policy DM1 in the Manchester Core Strategy.

17) Prior to the commencement of development, a construction management plan outlining working practices during development shall be submitted to and approved in writing by the local planning authority, which for the avoidance of doubt should include:

- a) Evidence of community engagement with adjoining residential occupiers with regard to construction management arrangements. In particular, that residents have been notified in writing with respect to the timescale for the commencement and completion of development, hours of work and site access arrangements.
- b) Details of an emergency telephone number.
- c) Dust suppression measures.
- d) Compound locations where relevant.
- e) Location, removal and recycling of waste.
- f) Parking and routing of construction vehicles.
- g) Sheeting over of construction vehicles.
- h) The washing of contractor wheels and access roads.

Development shall only be carried out in accordance with the approved construction management.

Informatives

Building Regulations 2010

This permission does not grant approval under Building Regulations.

Street Naming & Numbering Requirements

Manchester City Council is responsible for allocating street naming and numbering within Manchester for new developments or property conversions. Individuals or businesses are not permitted to allocate their own property numbers, building or street names.

If your development includes the creation of new dwellings (either new build or conversion of existing buildings), creation of new commercial properties or the subdivision of existing properties you must ensure that you request new or changes to addresses through us so they can be officially allocated and registered in accordance with the Public Health Act 1925 Sections 17-19 & Greater Manchester Act 1981 Section 22.

Failure to do this may result in difficulties for the developer/occupier when requiring services such as connections to utilities, phone lines and postal services and may delay your development.

You can apply online at the following address:

http://www.manchester.gov.uk/info/100011/roads_parking_and_transport/1988/naming_and_numbering_of_houses_buildings_streets_and_roads/2

Informative for condition 6 - Noise survey data must include measurements taken during a rush-hour period and night time to determine the appropriate sound insulation measures necessary. The following noise criteria will be required to be achieved:

Bedrooms (night time - 23.00 - 07.00)	30 dB LAeq (individual noise events shall not exceed 45 dB L _{Amax,F} by more than 15 times)
Living Rooms (daytime - 07.00 - 23.00)	35 dB LAeq
Gardens and terraces (daytime)	55 dB LAeq

Noise survey data must include measurements taken during a rush-hour period and night time to determine the appropriate sound insulation measures necessary. With regards to aircraft, take-offs are more noisy than landings and so data is required for aircraft movements during easterly and westerly conditions. The internal noise criteria are as follows:

Bat Roost - Whilst the building to be converted has been assessed as low risk for bats, the applicant is reminded that under the Habitat Regulation it is an offence to disturb, harm or kill bats. If a bat is found all work should cease immediately and a suitably licensed bat worker employed to assess how best to safeguard the bat(s). Natural England should also be informed.

Aerodrome Safeguarding - Cranes, whilst they are temporary, can be a hazard to air safety. The developer or crane operator must therefore contact Manchester Airport's Control of Works Office using the details provided below, at least 21 days in advance of intending to erect a crane or other tall construction equipment on the site. This is to obtain a Tall Equipment Permit and to ascertain if any operating restrictions would be required. Any operating restrictions that are subsequently imposed by Manchester Airport must be fully complied with. Email: control-of-works@magairports.com Tel: 0161 489 6114 It is important that any conditions in this response are applied to a plan

Date: 25 September 2020

Signed: 

Julie Roscoe
Director of Planning, Building Control & Licensing

Manchester City Council, P O Box 532, Town Hall, Manchester M60 2LA

Notes

1. This permission refers only to that required under the Town and Country Planning Act 1990 does not include any consent or approval under any other enactment, byelaw, order or regulation.

2 If the applicant is aggrieved by the decision of the local planning authority to refuse permission or approval for the proposed development, or to grant permission or approval subject to conditions, they may appeal to the Secretary of State in accordance with Section 78(1) of the Town and Country Planning Act 1990 within six months of the date of the notice of the decision.

The Planning Inspectorate have introduced an online appeals service that can be used to make appeals online. This service is available through the gov.uk website – www.gov.uk/planning-inspectorate. The Inspectorate will publish details of your appeal on the internet. Alternatively If you are unable to access the online appeal form, please contact the Planning Inspectorate to obtain a paper copy of the appeal form on tel: 0303 444 5000.

The Secretary of State has power to allow a longer period for the giving of a notice of appeal but they will not normally be prepared to exercise this power unless there are special circumstances that excuse the delay in giving notice of appeal.

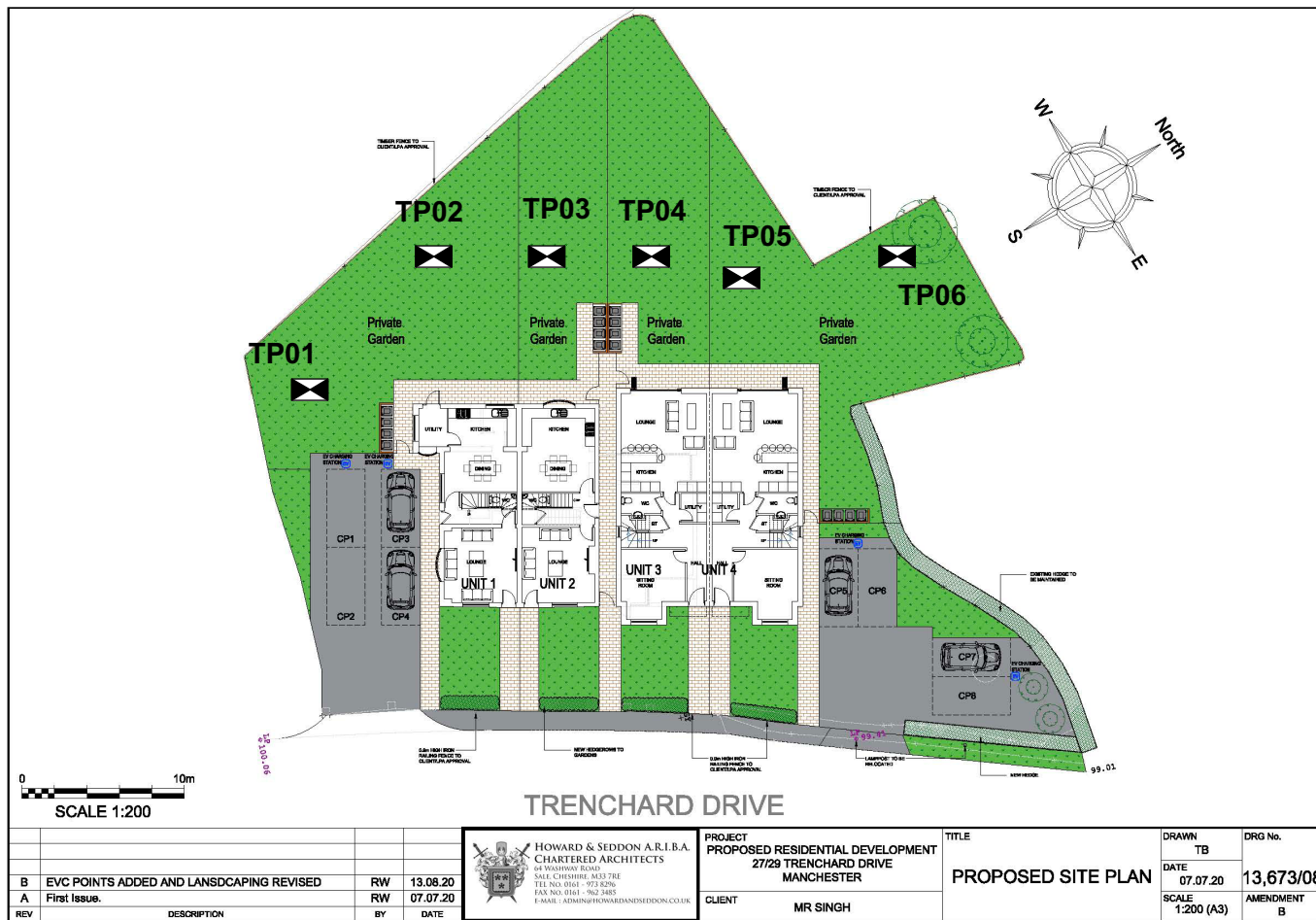
If you intend to submit an appeal that you would like examined by inquiry then you must notify the City Council (planning@manchester.gov.uk) and the Planning Inspectorate (inquiryappeals@planninginspectorate.gov.uk) at least 10 days before submitting the appeal. Further details are on GOV.UK.

3. The statutory requirements are those set out in Section 79(6) of the Town and Country Planning Act 1990, namely Sections 70(1) and 72(1) of the Act.

4. If either the local planning authority or the Secretary of State refuses permission to develop land or grants it subject to conditions, the owner may claim that they can neither put the land to a reasonably beneficial use in its existing state nor render the land capable of a reasonably beneficial use by the carrying out of any development which has been or would be permitted.

In these circumstances, the owner may serve a purchase notice on the Council in whose area the land is situated. This notice will require the Council to purchase his interest in the land in accordance with the provisions of Part VI of the Town and Country Planning Act 1990

5. In certain circumstances, a claim may be made against the local planning authority for compensation, where permission is refused or granted subject to conditions by the Secretary of State on appeal or on a reference of the application to them. The circumstances in which such compensation is payable are set out in Section 114 of the Town and Country Planning Act 1990.



GeoEnviro Solutions Ltd
 4A Haggwood Stone Quarry,
 Woodhead Road, Honley,
 HD9 6PW
 Tel: 01484 986010
 Email: info@geoenvirosolutions.com
 Web: www.geoenvirosolutions.com



PROJECT NAME Trenchard Drive

PROJECT NUMBER 5210-24

TITLE
TP Location Plan

DRAWING NO.

5210-24/01

SCALE

N.T.S

DATE

Nov 2024

DRAWN BY

JD

APPENDIX 2
TRIAL PIT LOGS



Trial Pit Log

Project Name: 27-29 Trenchard Drive		Client: Kansho Property Limited		Date: 05/11/2024	
Location: Trenchard Drive, Wythenshawe, Manchester		Contractor: GeoEnviro Solutions Ltd			
Project No. : 5210-24		Crew Name: GeoEnviro Solutions Ltd		Equipment: Hand Tools	
Location Number TP01	Location Type TP	Level	Logged By JD	Scale 1:10	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30 - 0.45	ES		0.03			Grass over dark brown slightly clayey medium SAND with occasional rootlets. [TOPSOIL]	1 2
					0.20			MADE GROUND: Dark brown gravelly medium SAND with occasional plastic tube pieces. Gravel is of angular to sub-rounded quartz, brick, sandstone, concrete, and glass.	
					0.45			MADE GROUND: Densely compacted dark brown gravelly medium SAND with occasional cobbles. Gravel is of angular to sub-rounded quartz, brick, sandstone, and glass. Cobbles are of angular sandstone and brick.	
					0.60			Dark brown slightly gravelly medium SAND with occasional rootlets. Gravel is of sub-angular to sub-rounded medium to coarse sandstone. [TILL]	
								End of Borehole at 0.600m	

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
0.30	0.30	Stable					

Remarks
1. No visual or olfactory evidence of hydrocarbon contamination was noted. 2. Groundwater was not encountered. 3. The trial pit was backfilled with arisings.



Trial Pit Log

Project Name: 27-29 Trenchard Drive			Client: Kansho Property Limited			Date: 05/11/2024					
Location: Trenchard Drive, Wythenshawe, Manchester			Contractor: GeoEnviro Solutions Ltd								
Project No. : 5210-24			Crew Name: GeoEnviro Solutions Ltd			Equipment: Hand Tools					
Location Number TP02		Location Type TP		Level		Logged By JD		Scale 1:10		Page Number Sheet 1 of 1	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.30 - 0.50	ES		0.04			Grass over dark brown slightly clayey medium SAND with occasional rootlets. [TOPSOIL] MADE GROUND: Dark brown slightly gravelly medium SAND with occasional rootlets. Gravel is of sub-angular to sub-rounded fine to medium brick, sandstone, and concrete. MADE GROUND: Grey slightly sandy GRAVEL. Sand is of medium grain. Gravel is of angular to sub-rounded fine to medium brick and concrete. MADE GROUND: Dark brown gravelly medium SAND with occasional fragments of plywood pallet and cobbles. Gravel is of angular to sub-rounded to sandstone, brick, clay pottery fragments, flint, and slate. Cobbles are of sub-angular sandstone and brick. Dark brown slightly gravelly medium SAND with occasional rootlets. Gravel is of sub-angular to sub-rounded medium to coarse sandstone. [TILL]			
					0.14						
					0.18						
					0.30						
					0.60						
							End of Borehole at 0.600m				
Dimensions		Trench Support and Comment				Pumping Data					
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks			Date	Rate	Remarks		
0.30	0.30	Stable									
Remarks											
1. No visual or olfactory evidence of hydrocarbon contamination was noted. 2. Groundwater was not encountered. 3. The trial pit was backfilled with arisings.											



Trial Pit Log

Project Name: 27-29 Trenchard Drive				Client: Kansho Property Limited				Date: 05/11/2024			
Location: Trenchard Drive, Wythenshawe, Manchester				Contractor: GeoEnviro Solutions Ltd							
Project No. : 5210-24				Crew Name: GeoEnviro Solutions Ltd				Equipment: Hand Tools			
Location Number TP04		Location Type TP		Level		Logged By JD		Scale 1:10		Page Number Sheet 1 of 1	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.30 - 0.50	ES		0.07			Grass over dark brown slightly clayey medium SAND with occasional rootlets. [TOPSOIL] MADE GROUND: Dark brown gravelly medium SAND with occasional plastic tube pieces. Gravel is of angular to sub-rounded quartz, brick, sandstone, concrete, and glass. MADE GROUND: Dark brown slightly clayey slightly sandy GRAVEL with occasional fragments of bin liner bags.			
					0.15						
					0.50						
					0.60			Firm slightly sandy CLAY. Sand is medium grain. [TILL]			
								End of Borehole at 0.600m			
Dimensions		Trench Support and Comment		Pumping Data							
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks				
0.30	0.30	Stable									
Remarks											
1. No visual or olfactory evidence of hydrocarbon contamination was noted. 2. Groundwater was not encountered. 3. The trial pit was backfilled with arisings.											



Trial Pit Log

Project Name: 27-29 Trenchard Drive		Client: Kansho Property Limited		Date: 05/11/2024	
Location: Trenchard Drive, Wythenshawe, Manchester		Contractor: GeoEnviro Solutions Ltd			
Project No. : 5210-24		Crew Name: GeoEnviro Solutions Ltd		Equipment: Hand Tools	
Location Number TP05	Location Type TP	Level	Logged By JD	Scale 1:10	Page Number Sheet 1 of 1

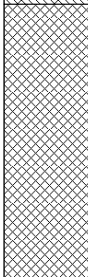
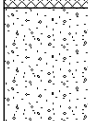
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.37 - 0.50	ES		0.08			Grass over dark brown slightly clayey medium SAND with occasional rootlets. [TOPSOIL]	
					0.37			MADE GROUND: Dark brown gravelly medium SAND with occasional plastic tube pieces. Gravel is of angular to sub-rounded quartz, brick, sandstone, concrete, and glass.	
					0.60			MADE GROUND: Dark brown slightly gravelly medium SAND with occasional rootlets. Gravel is of sub-angular to sub-rounded fine to medium sandstone and brick.	
								End of Borehole at 0.600m	

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
0.30	0.30	Stable					

Remarks
1. No visual or olfactory evidence of hydrocarbon contamination was noted. 2. Groundwater was not encountered. 3. The trial pit was backfilled with arisings.





Project Name: 27-29 Trenchard Drive					Client: Kansho Property Limited					Date: 05/11/2024				
Location: Trenchard Drive, Wythenshawe, Manchester					Contractor: GeoEnviro Solutions Ltd									
Project No. : 5210-24					Crew Name: GeoEnviro Solutions Ltd					Equipment: Hand Tools				
Location Number TP06		Location Type TP			Level		Logged By JD		Scale 1:10		Page Number Sheet 1 of 1			
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description						
		Depth (m)	Type	Results										
		0.30 - 0.45	ES		0.08			Grass over dark brown slightly clayey medium SAND with occasional rootlets. [TOPSOIL]						
								MADE GROUND: Dark brown gravelly medium SAND with occasional plastic tube pieces. Gravel is of angular to sub-rounded quartz, ceramic tile, brick, sandstone, concrete, and glass.						
								Dark brown slightly gravelly medium SAND with occasional rootlets. Gravel is of sub-angular to sub-rounded medium to coarse sandstone. [TILL]						
							End of Borehole at 0.600m							
Dimensions		Trench Support and Comment				Pumping Data								
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks		Date	Rate	Remarks						
0.30	0.30	Stable												
Remarks														
1. No visual or olfactory evidence of hydrocarbon contamination was noted. 2. Groundwater was not encountered. 3. The trial pit was backfilled with arisings.														

APPENDIX 3
CHEMICAL TESTING RESULTS



ANALYTICAL TEST REPORT

Report Number 24-03893, issue number 1

Contract name: Trenchard Drive Manchester

Client reference: 5210-24

Clients name: GeoEnviro Solutions

Clients address: GeoEnviro Solutions
Unit 7 Springvale Works
Brookfoot Lane
Brighouse
HD6 2RA

Samples received: 08/11/2024

Analysis started: 08/11/2024

Analysis completed: 15/11/2024

Report issued: 15/11/2024

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
\$	Test carried out by an approved subcontractor
I/S	Insufficient sample to carry out test
U/S	Sample not suitable for testing
NAD	No Asbestos Detected

Approved by: Abbie Neasham-Bourn
Senior Reporting Administrator

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Lab ref	Sample ID	Depth (m)	Sample description	Material removed	% Removed	% Moisture
21743	TP01	0.30 - 0.45	Brown Loamy Sand with Gravel and Vegetation.	-	-	15.8
21744	TP02	0.30 - 0.50	Brown Loamy Sand with Gravel and Vegetation.	-	-	13.6
21745	TP03	0.30 - 0.45	Brown Loamy Sand with Gravel and Vegetation.	-	-	15.4
21746	TP04	0.30 - 0.50	Brown Loamy Sand with Gravel and Vegetation.	-	-	11.9
21747	TP05	0.37 - 0.50	Brown Loamy Sand with Gravel and Vegetation.	-	-	10.5
21748	TP06	0.30 - 0.45	Brown Loamy Sand with Gravel and Vegetation.	-	-	11.7

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

- a Sampling date not provided
- b Sampling time not provided (waters only)
- c Sample not received in appropriate containers
- d Storage Temperature
- e Headspace present in sample container
- f Sample exceeded sampling to receipt
- g Sample exceeded holding time(s)

Lab ref	Sample ID	Depth (m)	Deviating	Tests (Reason for deviation)
21743	TP01	0.30 - 0.45	N	
21744	TP02	0.30 - 0.50	N	
21745	TP03	0.30 - 0.45	N	
21746	TP04	0.30 - 0.50	N	
21747	TP05	0.37 - 0.50	N	
21748	TP06	0.30 - 0.45	N	

SOILS

Lab Number					21743	21744	21745	21746	21747
Client Reference					SOIL	SOIL	SOIL	SOIL	SOIL
Sample ID					TP01	TP02	TP03	TP04	TP05
Depth (m)					0.30 - 0.45	0.30 - 0.50	0.30 - 0.45	0.30 - 0.50	0.37 - 0.50
Sampling Date					05/11/2024	05/11/2024	05/11/2024	05/11/2024	05/11/2024
Test	Method	Accred	LoD	Units					
Asbestos									
Asbestos Identification	SUBCON	SU	0	-	NAD	NAD	NAD	NAD	NAD
Metals									
Arsenic	CE264	U	1.8	mg/kg	20.1	16.0	13.1	8.8	9.2
Cadmium	CE264	M	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Chromium	CE264	U	2	mg/kg	22.9	22.3	17.5	17.7	15.4
Copper	CE264	M	1.6	mg/kg	66.4	40.3	43.5	31.2	30.9
Lead	CE264	U	2.3	mg/kg	629	211	231	155	147
Mercury	CE264	U	0.7	mg/kg	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Nickel	CE264	M	2.1	mg/kg	24.5	18.1	17.1	14.9	12.6
Selenium	CE264	U	3	mg/kg	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Zinc	CE264	M	4	mg/kg	288	79.2	145	92.7	103
Volatile Petroleum Hydrocarbons									
>C5-C6 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
>C6-C8 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
>C8-C10 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
>C8-C10 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
>C6-C7 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
>C7-C8 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Colourimetric									
Water Soluble Chromium VI	CE263	N	0.04	mg/kg	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Water Soluble Sulphate	CE261	U	1.8	mg/l	328	359	683	3390	1860
Total Monohydric Phenols	CE078	N	0.5	mg/kg	0.99	< 0.50	< 0.50	< 0.50	< 0.50
Total Cyanide	CE077	N	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Combustion									
Moisture Content	CE001	N	0.1	%	15.8	13.6	15.4	11.9	10.5
Soil Organic Matter	CE072	N	0.1	%	16.1	0.79	9.74	4.84	6.45
Soil Organic Matter	CE072	N	0.1	%	16.1	0.79	9.74	4.84	6.45
TPH Ali/Aro									
>C12-C16 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	0.6	< 0.5	0.5	0.8	0.8
>C12-C16 Aromatic (EH_2D_AR)	CE250	N	1	mg/kg	5.0	2.0	4.5	6.9	7.1

SOILS

>C16-C21 Aliphatic (EH_2D_AL)	CE250	N	0.7	mg/kg	0.9	< 0.7	1.0	2.0	1.2
>C16-C21 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	8.8	< 2.0	7.0	11.3	16.1
>C21-C35 Aliphatic (EH_2D_AL)	CE250	N	4	mg/kg	< 4.0	< 4.0	4.3	35.3	4.9
>C21-C35 Aromatic (EH_2D_AR)	CE250	N	4.5	mg/kg	31.7	11.0	29.8	71.4	41.7
>C35-C44 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	< 0.5	< 0.5	< 0.5	10.1	< 0.5
>C35-C44 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	7.9	3.1	6.7	17.4	9.3
>C10-C12 Aliphatic (EH_2D_AL)	CE250	N	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic (EH_2D_AR)	CE250	N	0.6	mg/kg	1.5	0.7	1.4	2.3	1.8
Polyaromatic hydrocarbons									
Naphthalene	CE087	M	0.016	mg/kg	0.042	0.021	0.100	< 0.016	0.025
Acenaphthylene	CE087	M	0.015	mg/kg	0.034	< 0.015	0.067	< 0.015	0.023
Acenaphthene	CE087	M	0.013	mg/kg	0.063	0.025	0.124	0.072	0.036
Fluorene	CE087	U	0.013	mg/kg	0.046	0.019	0.101	0.052	0.026
Phenanthrene	CE087	M	0.014	mg/kg	0.740	0.222	1.79	0.642	0.331
Anthracene	CE087	U	0.017	mg/kg	0.199	0.066	0.387	0.211	0.086
Fluoranthene	CE087	M	0.017	mg/kg	1.65	0.456	3.68	1.54	0.780
Pyrene	CE087	M	0.016	mg/kg	1.40	0.381	3.12	1.33	0.719
Benzo(a)anthracene	CE087	U	0.012	mg/kg	0.795	0.231	1.56	0.750	0.474
Chrysene	CE087	M	0.028	mg/kg	0.859	0.234	1.66	0.760	0.495
Benzo(b)fluoranthene	CE087	M	0.02	mg/kg	1.05	0.263	1.98	0.927	0.651
Benzo(k)fluoranthene	CE087	M	0.025	mg/kg	0.417	0.104	0.710	0.340	0.228
Benzo(a)pyrene	CE087	U	0.019	mg/kg	0.896	0.224	1.67	0.816	0.534
Indeno(1,2,3-cd)pyrene	CE087	M	0.019	mg/kg	0.521	0.130	0.990	0.468	0.320
Dibenzo(a,h)anthracene	CE087	M	0.017	mg/kg	0.140	0.037	0.242	0.117	0.084
Benzo(g,h,i)perylene	CE087	M	0.019	mg/kg	0.608	0.150	1.12	0.519	0.377
Total PAH(16)	CE087	N	0.28	mg/kg	9.45	2.56	19.3	8.55	5.19
BTEX									
Benzene	CE267	U	0.0005	mg/kg	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Toluene	CE267	U	0.001	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	CE267	U	0.001	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes	CE267	N	0.003	mg/kg	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
MTBE	CE267	N	0.002	mg/kg	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
m,p-Xylene	CE267	U	0.002	mg/kg	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
oXylenes	CE267	U	0.002	mg/kg	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Wet Chem									
pH	CE004	M	0.1	pH units	6.6	6.3	7.2	7.8	7.6

SOILS

Lab Number					21748
Client Reference					SOIL
Sample ID					TP06
Depth (m)					0.30 - 0.45
Sampling Date					05/11/2024
Test	Method	Accred	LoD	Units	
Asbestos					
Asbestos Identification	SUBCON	SU	0	-	NAD
Metals					
Arsenic	CE264	U	1.8	mg/kg	9.2
Cadmium	CE264	M	1.6	mg/kg	< 1.6
Chromium	CE264	U	2	mg/kg	20.0
Copper	CE264	M	1.6	mg/kg	47.3
Lead	CE264	U	2.3	mg/kg	233
Mercury	CE264	U	0.7	mg/kg	< 0.7
Nickel	CE264	M	2.1	mg/kg	17.6
Selenium	CE264	U	3	mg/kg	< 3.0
Zinc	CE264	M	4	mg/kg	147
Volatile Petroleum Hydrocarbons					
>C5-C6 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	< 0.10
>C6-C8 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	< 0.10
>C8-C10 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	< 0.10
>C8-C10 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	< 0.010
>C6-C7 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	< 0.010
>C7-C8 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	< 0.010
Colourimetric					
Water Soluble Chromium VI	CE263	N	0.04	mg/kg	< 0.040
Water Soluble Sulphate	CE261	U	1.8	mg/l	843
Total Monohydric Phenols	CE078	N	0.5	mg/kg	< 0.50
Total Cyanide	CE077	N	1	mg/kg	1.5
Combustion					
Moisture Content	CE001	N	0.1	%	11.7
Soil Organic Matter	CE072	N	0.1	%	8.53
Soil Organic Matter	CE072	N	0.1	%	8.53
TPH Ali/Aro					
>C12-C16 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	0.7
>C12-C16 Aromatic (EH_2D_AR)	CE250	N	1	mg/kg	6.0

SOILS

>C16-C21 Aliphatic (EH_2D_AL)	CE250	N	0.7	mg/kg	1.7
>C16-C21 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	18.8
>C21-C35 Aliphatic (EH_2D_AL)	CE250	N	4	mg/kg	5.4
>C21-C35 Aromatic (EH_2D_AR)	CE250	N	4.5	mg/kg	50.5
>C35-C44 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	0.6
>C35-C44 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	11.2
>C10-C12 Aliphatic (EH_2D_AL)	CE250	N	1	mg/kg	< 1.0
>C10-C12 Aromatic (EH_2D_AR)	CE250	N	0.6	mg/kg	1.8
Polyaromatic hydrocarbons					
Naphthalene	CE087	M	0.016	mg/kg	< 0.016
Acenaphthylene	CE087	M	0.015	mg/kg	< 0.015
Acenaphthene	CE087	M	0.013	mg/kg	< 0.013
Fluorene	CE087	U	0.013	mg/kg	< 0.013
Phenanthrene	CE087	M	0.014	mg/kg	< 0.014
Anthracene	CE087	U	0.017	mg/kg	< 0.017
Fluoranthene	CE087	M	0.017	mg/kg	< 0.017
Pyrene	CE087	M	0.016	mg/kg	< 0.016
Benzo(a)anthracene	CE087	U	0.012	mg/kg	< 0.012
Chrysene	CE087	M	0.028	mg/kg	< 0.028
Benzo(b)fluoranthene	CE087	M	0.02	mg/kg	< 0.020
Benzo(k)fluoranthene	CE087	M	0.025	mg/kg	< 0.025
Benzo(a)pyrene	CE087	U	0.019	mg/kg	< 0.019
Indeno(1,2,3-cd)pyrene	CE087	M	0.019	mg/kg	< 0.019
Dibenzo(a,h)anthracene	CE087	M	0.017	mg/kg	< 0.017
Benzo(g,h,i)perylene	CE087	M	0.019	mg/kg	< 0.019
Total PAH(16)	CE087	N	0.28	mg/kg	< 0.280
BTEX					
Benzene	CE267	U	0.0005	mg/kg	< 0.0005
Toluene	CE267	U	0.001	mg/kg	< 0.001
Ethylbenzene	CE267	U	0.001	mg/kg	< 0.001
Xylenes	CE267	N	0.003	mg/kg	< 0.003
MTBE	CE267	N	0.002	mg/kg	< 0.002
m,p-Xylene	CE267	U	0.002	mg/kg	< 0.002
oXylenes	CE267	U	0.002	mg/kg	< 0.002
Wet Chem					
pH	CE004	M	0.1	pH units	7.6

METHOD DETAILS

METHOD	TESTNAME	METHOD SUMMARY	ANALYSIS BASIS
CE267	VPH in Soil	HS-GCFID	As submitted sample
SUBCON	Asbestos Solid	HSG248	Air Dried Sample
CE264	Metals by ICP in Soil	ICPOES	Air dried sample
CE267	BTEX in solids	Analysis by HSGCFID	As submitted sample
CE263	ChromiumVI by Discrete Analyser in Solid	Gallery	Air dried sample
CE261	Anions by Discrete Analyser in Solids	Gallery	Air dried sample
CE250	GCXGC in Solids	DCM Extraction and GCxGC-FID	As submitted sample
CE087	PAH in Soil	DCM Extraction and GCMS	As submitted sample
CE078	Phenols in Solids	Continuous Flow Analyser	As submitted sample
CE077	Cyanides in Solids	Continuous Flow Analyser	As submitted sample

REPORT INFORMATION

Report No.:24-03893, issue number 1

Key

U	ISO17025 Accredited Result
M	ISO17025 and MCERTS Accredited Result
N	Do not currently hold accreditation
^	MCERTS accreditation not applicable for sample matrix
*	ISO17025 accreditation not applicable for sample matrix
S	Subcontracted
I/S	Insufficient Sample
U/S	Unsuitable sample
N/T	Not tested
<	Means "less than"
>	Means "greater than"

LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.

This report shall not be reproduced except in full, without prior written approval.

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

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

The results relate only to the sample received.

Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Moisture Content Calculated on a Wet Weight basis

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

Sampling was undertaken by Chemtech Environmental Limited and is outside the UKAS accreditation scope.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

BTEX compounds are identified by retention time only and may include interference from co-eluting compounds.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying

For soils and solids, analytical results are inclusive of stones, where applicable.

Sample Retention and Disposal

All soil samples will be retained for a period of 4 weeks from the point of receipt

All water samples will be retained for a period of 2 weeks from the point of Reporting

Charges may apply to extended sample storage

TPH Classification - HWOL Acronym System

HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
2D	GC-GC - Double coil gas chromatography
#1	EH_Total but with humics mathematically subtracted
#2	EH_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry

APPENDIX 4

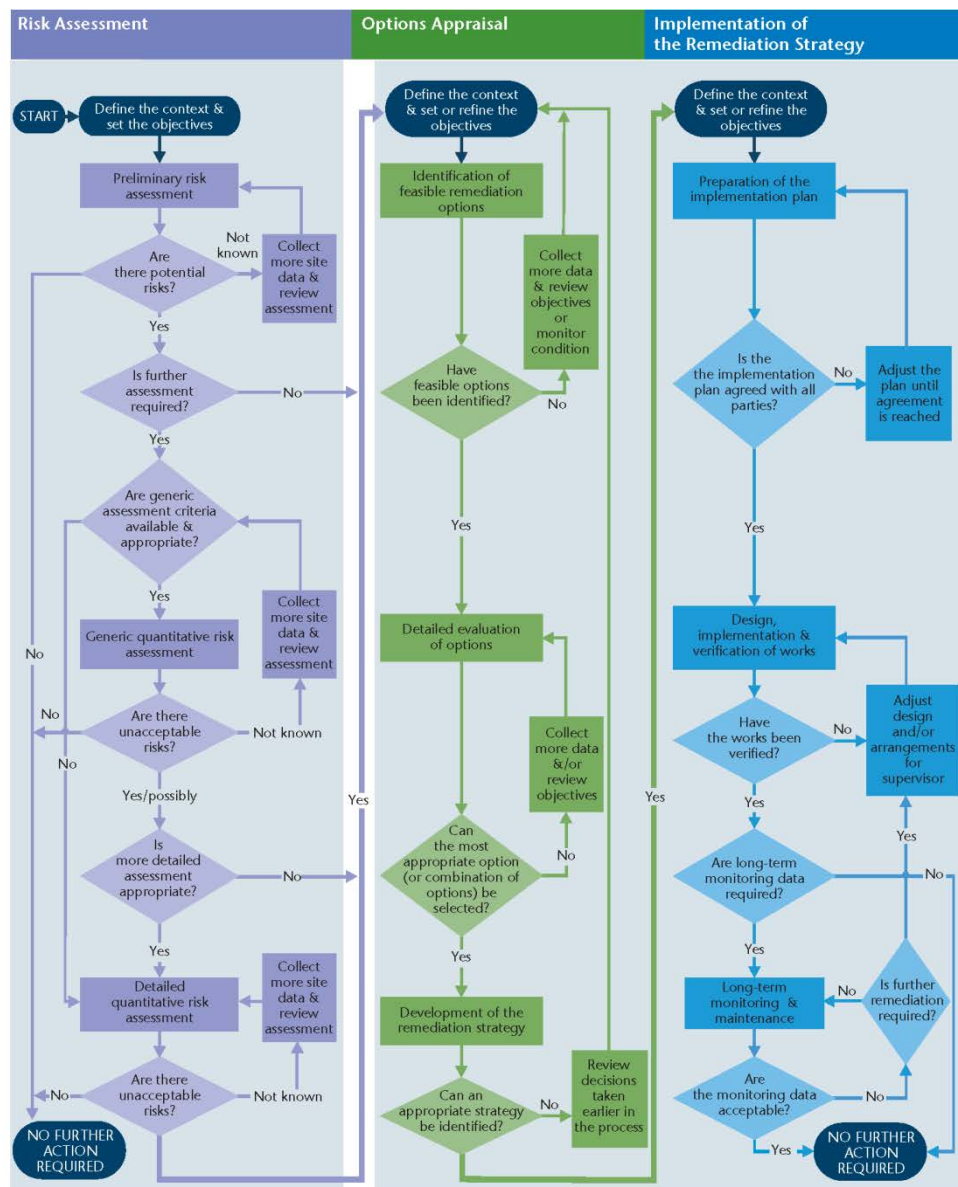
CHEMICAL SCREENING CRITERIA

APPENDIX H - HUMAN HEALTH ASSESSMENT CRITERIA

Context

Contaminated Land is defined under law through Part IIA of the Environmental Protection Act 1990, implemented through Section 57 of the Environment Act 1995 and associated guidance ("Part IIA"). These specify that a "suitable for use" approach is to be applied in the assessment of potentially contaminated land, implemented through a phased programme of site investigation and risk assessment appropriate to the site under consideration.

The assessment of potential risks posed by contaminated land is based upon the assessment of plausible contaminant source - pathway - receptor linkages ("pollutant linkages") for the current and/or proposed future use of the site. The process for the assessment of contaminated land adopted in this report is in line with guidance issued by DEFRA and Environment Agency (EA) 2004: "Model Procedures for the Management of Contaminated Land (CLR11)". The overall process for the management of land contamination is shown Figure 1 of CLR11 and reproduced below:



The risk assessment and subsequent investigation, remediation and verification must address all potential sources of pollutants that may be present on the site (the "hazards"), all receptors that may be harmed by these (e.g. human health, controlled waters, ecological receptors) and the pathways by which the contamination may be transported from the

contaminant source(s) to the receptor(s). This is defined within the conceptual model for the site, which represents the characteristics of the site in a form that shows the possible pollutant linkages. As further information becomes available (for example, through site investigation), so the conceptual model will be refined.

Remedial action can be specified at any phase within this assessment process to break the identified pollutant linkage. In determining whether or not to undertake further assessment or to undertake remediation, the potential cost-savings arising from a more thorough assessment of the pollutant linkages and more tightly defined remedial strategy must be considered against the direct costs involved in the work and the time that this will take to execute and gain regulatory approval.

A different approach to the statistical appraisal of data is required depending on whether the assessment is being undertaken to assess land as Contaminated Land in accordance with the regulations or whether the assessment is to assess whether the site is suitable for new development in accordance with the Planning regime. The statistical approach to assessment is discussed further in CL:AIRE:2009 "Guidance on Comparing Data with a Critical Concentration".

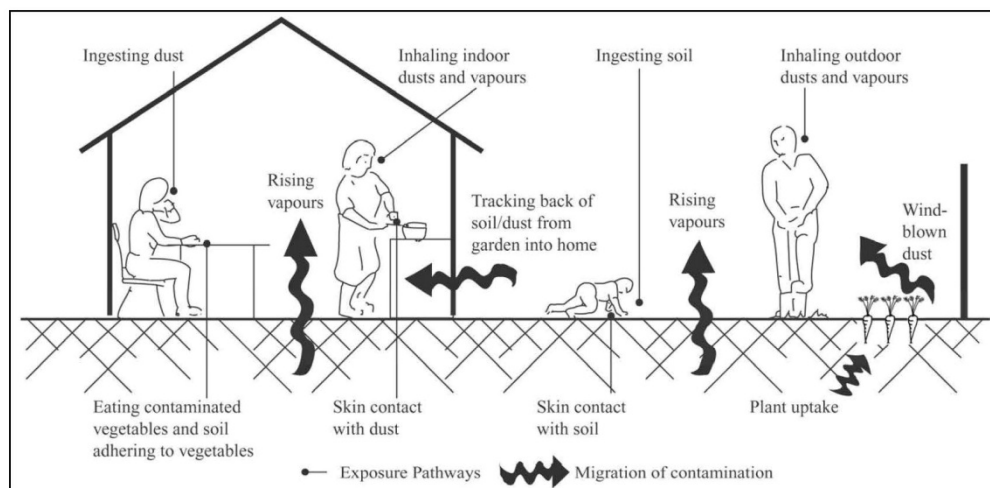
Some form of Detailed Quantitative Risk Assessment (DQRA) will be essential for those cases where appropriate GAC values cannot be established for the contaminant linkages under consideration.

Generic Assessment Criteria for Human Health Risk Assessment

In March 2002, the Department for Environment, Food and Rural Affairs (DEFRA) and the Environment Agency (EA) published the Contaminated Land Exposure Assessment (CLEA) Model and a series of related reports and guidance. These were designed to provide a scientifically based framework for the assessment of chronic risks to human health from contaminated land. The initial documents (CLR7 – 10) were withdrawn and replaced with revised guidance issued by the Environment Agency including:

- “Using Soil Guideline Values”; SC050021/SGV Introductions, EA, 2009;
- “Human Health toxicology assessment of contaminants in soil”; SC050021/SR2, EA, 2009;
- “Update technical background to the CLEA model”; SC050021/SR3, EA, 2009;
- CLEA Software (Version) Handbook; SC050021/SR4; EA, 2008;
- Compilation of Data for priority Organic Contaminants for Derivation of Soil Guideline Values; Science Report SC050021/SR7, 2008; and,
- Guidance on Comparing Data with a Critical Concentration; CL:AIRE, 2009.

The CLEA model and associated guidance was developed to calculate an estimated tolerable daily intake (TDI) of contaminants for site users given a set of ‘typical’ human health exposure pathways which are detailed in “SR3: Updated technical background to the CLEA model” (Science Report SC050021/SR3, EA, 2009) and reproduced below.



- **Ingestion**
 - o Outdoor soil;
 - o Indoor dust;
 - o Home grown produce;
 - o Soil attached to home grown produce.
- **Dermal Contact**
 - o Outdoor soil;
 - o Indoor dust.
- **Inhalation**
 - o Outdoor dust;
 - o Indoor dust;
 - o Outdoor vapour;
 - o Indoor vapour.

It should be noted that the CLEA model does not include an exhaustive list of potential exposure pathways, e.g. certain compounds can pass through plastic water pipes into drinking water supply.

The potential significance of each of the exposure pathways is dependent upon the type of land use and the nature of the contaminant being considered. The CLEA model considers principal 'default' land use scenarios and makes a series of assumptions with regards to building type (where applicable), identification of the critical human receptor group, exposure frequency and duration. The definitions of the principal land use types given in SR3 (EA, 2009) are:

- **Residential land use;**

A typical residential property consisting of a two story terraced house built on a ground-bearing slab of 0.15m thickness with a private garden consisting of lawn, flowerbeds, and a small fruit and vegetable patch. The occupants are assumed to be parents with young children, who make regular use of the garden. The critical receptor is a 0 – 6 year old female.

Active exposure pathway are: ingestion of outdoor soil, ingestion of indoor dust, ingestion of home grown produce and soil adhering to home grown produce; direct dermal contact with outdoor soil and indoor dust; inhalation of outdoor dust and vapour and indoor dust and vapour.

- **Allotments**

A plot of open space commonly made available by the Local Authority to tenants to grow fruit and vegetables for their own consumption. There are usually several plots to a site and the overall site area may cover more than one hectare. The tenants are assumed to be the parents or grandparents and that young children make occasional accompanied visits to the plots. The critical receptor is a 0 – 6 year old female and there is no building present on Site.

Active exposure pathways are ingestion of outdoor soil, ingestion of home grown produce and soil adhering to home grown produce; direct dermal contact with outdoor soil; inhalation of outdoor vapour.

- **Commercial and industrial land use.**

A typical commercial or light industrial property consisting of a three-story office building (pre-1970) with a ground bearing floor slab at which employees spend most time indoors and are involved in office based or related light physical work. The critical receptor is a working female adult aged 16 – 65 years.

Active exposure pathway are ingestion of outdoor soil, ingestion of indoor dust; direct dermal contact with outdoor soil and indoor dust; inhalation of outdoor dust and vapour and inhalation of indoor dust and vapour.

Soil Guideline Values

Based on the assumption of each land use type, the EA and DEFRA developed and published Soil Guideline Value (SGV) using the CLEA model for a number of principal contaminants and 'default' end-use scenarios of residential, allotments and commercial/industrial use. The primary purpose of the SGVs are as trigger value for the tolerable daily intake (TDI), below which it can be assumed that the soil does not pose an unacceptable risk to the identified receptor. Where soils contamination is present above this level further assessment may be required. SGVs were developed for the following contaminants:

- Heavy metals and other inorganic compounds: arsenic, cadmium, chromium, cyanide, lead (now withdrawn), mercury, nickel and selenium;
- Benzene, ethylbenzene, toluene and xylenes;
- Phenol;
- Dioxins and dioxin-like polychlorinated biphenyls (PCBs)
- Polycyclic aromatic hydrocarbons (PAHs) – 11 substances

LQM/CIEH Generic Assessment Criteria of Human Health Risk Assessment

In addition, in 2009 CIEH through LQM and EIC published generic assessment criteria (GACs) for 82 substances including metals, petroleum hydrocarbons, PAHs and explosive substances for a variety of soil types and the three 'default' land uses – (residential, allotments and commercial end-uses) as described in SR3 (EA, 2009). These have been superseded as described below.

Category 4 Screening Values

In 2013 "SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination" (CL:AIRE 2013) was issued which detailed findings of a research project undertaken by CL:AIRE to set out the framework by which potential Category 4 Screening Levels (pC4SL) may be derived. This was supplemented in 2014 by "SP1010: Development of Category 4 Screening Levels for the Assessment of Land Affected by Contamination – Policy Companion Document" (DEFRA, 2014). SP1010 proposed several updated toxicology information relating to contaminant behaviour updated assumptions relating to the modelling of human exposure to soil contaminants, derivation of separate C4SLs for residential with the consumption of home grown produce, residential without the consumption of home grown produce, and two new land uses: public open spaces near residential housing (POS resi) and public parks (POS park).

- **Public Open Space: Residential**

For public open space in close proximity to residential housing and the central green area around which houses are located, as on many housing estates from the 1930s to 1970s. It is also applicable for smaller areas commonly incorporated in newer developments as informal grassed areas or more formal landscaped areas with a mixture of open space and covered soil with planting. It is considered to be a generally grassed area up to 0.5ha with up to 50% bare soil. The land use is an important resource for children and the area is near the homes. The critical receptor is a female child age >3 - <9 years old (CLEA age class 4 – 9) as younger children are unlikely to play outdoors unsupervised.

Active exposure pathways are: ingestion of outdoor soil, ingestion of indoor dust; direct dermal contact with outdoor soil and indoor soil derived dust; inhalation of outdoor and indoor dust and inhalation of outdoor vapour.

- **Public Open Space: Park**

A public park is defined as an area of open space provided for recreational use and usually owned and maintained by the Local Authority. It is anticipated the park could be used for a wide range of activities, including the following:

- o Family visits and picnics;
- o Children's play area;
- o Sporting activities such as football on an informal basis (i.e. no a dedicated sports pitch); and
- o Dog walking.

The park is modelled as an area >0.5 ha of predominantly grasses open space with no more than 25% of exposed soil.

The critical receptor is a female child with CLEA age classes 1 – 6.

Active exposure pathway are: ingestion of outdoor soil; direct dermal contact with outdoor soil; inhalation of outdoor dust and inhalation of outdoor vapour.

Furthermore the C4SLs are based on a different toxicological benchmark, the 'low level of toxicological concern' (LLTC). This difference in approach was adopted because the C4SLs were primarily intended for use under Part2A of the EPA 1990 to quickly screen out Category 4 sites where there is "*no risk or that the level of risk posed is low*". SGVs and LQM GACs are

based on the more conservative 'minimal or tolerable level of risk' as defined in SR2 (EA, 2009) and were derived for assessment of contamination for the Planning process.

Lead

The SGV for lead was withdrawn in 2011 and is not used in this report. The C4SL for lead provides a technically robust and conservative assessment tool using significantly updated toxicological modelling than the withdrawn SGV and derived in line with current science of lead toxicology.

LQM/CIEH Suitable 4 Use Levels (S4ULs)

The publication of the C4SLs resulted in considerable and inconclusive debate about the applicability of the lower level of protection of the C4SL, which are underlain by the LLTC, outside of the Part 2A context for which they were derived. In 2014 LQM/CIEH presented a Suitable 4 Use Levels (S4ULs), which incorporate the updated assumption exposure derived for the production of the C4SLs but within the context of deriving screening criteria above which further assessment of the risks or remedial action may be needed. The S4ULs replace the 82 substances, species and fractions and congeners contained in the previous LQM/CIEH GACs issued in 2009. Additionally, following changes and new land uses proposed in the C4SL research project, S4ULs have also been derived for the majority of substances for which the EA derived SGVs in 2009.

The GAC values adopted in this report are summarised in Table 1, below.

[illegible]

Parameter	Residential <u>with</u> homegrown produce			Residential <u>without</u> homegrown produce			Allotment			Commercial / Industrial			Public Open Space near Residential			Public Open Space - Park			Source
	(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)						
SOM	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	
PAHs																			
Acenaphthene	210	510	1100	3000 (57)	4700(141)	6000 (336)	34	85	200	84000 (57)	97000 (141)	100000	15000	15000	15000	29000	30000	30000	LQM (2014)
Acenaphthylene	170	420	920	2900 (86.1)	4600 (212)	6000 (506)	28	69	160	8300 (86.1)	97000 (212)	100000	15000	15000	15000	29000	30000	30000	LQM (2014)
Anthracene	2400	5400	11000	31000 (1.17)	35000	37000	380	950	2200	520000	540000	540000	74000	74000	74000	150000	150000	150000	LQM (2014)
Benzo(a)anthracene	7.2	11	13	11	14	15	2.9	6.5	13	170	170	180	29	29	29	49	56	62	LQM (2014)
Benzo(a)pyrene	2.2	2.7	3	3.2	3.2	3.2	0.97	2	3.5	35	35	36	5.7	5.7	5.7	11	12	13	LQM (2014)
Benzo(b)fluoranthene	2.6	3.3	3.7	3.9	4	4	0.99	2.1	3.9	44	44	45	7.1	7.1	7.1	13	15	16	LQM (2014)
Benzo(g,h,i)perylene	320	340	350	360	360	360	290	470	640	3900	4000	4000	640	640	640	1400	1500	1600	LQM (2014)
Benzo(k)fluoranthene	77	93	100	110	110	110	37	75	130	1200	1200	1200	190	190	190	370	410	440	LQM (2014)
Chrysene	15	22	27	30	31	32	4.1	9.4	19	350	350	350	57	57	57	93	110	120	LQM (2014)
Dibenz(a,h)anthracene	0.24	0.28	0.3	0.31	0.32	0.32	0.14	0.27	0.61	3.5	3.6	3.6	0.57	0.57	0.58	1.1	1.3	1.4	LQM (2014)
Fluoranthene	280	560	890	1500	1600	1600	52	130	290	23000	23000	23000	3100	3100	3100	63	6300	6400	LQM (2014)
Fluorene	170	400	860	2800 (30.9)	3800 (76.5)	4500 (183)	27	67	160	63000 (30.9)	68000	71000	9900	9900	9900	20000	20000	20000	LQM (2014)
Indeno(1,2,3-cd)pyrene	27	36	41	45	46	46	9.5	21	39	500	510	510	82	82	82	150	170	180	LQM (2014)

Parameter	Residential <u>with</u> homegrown produce			Residential <u>without</u> homegrown produce			Allotment			Commercial / Industrial			Public Open Space near Residential			Public Open Space - Park			Source
	(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			
SOM	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	
Naphthalene	2.3	5.6	13	2.3	5.6	13	4.1	10	24	190 (76.4)	460 (183)	1100 (432)	4900	4900	4900	1200 (76.4)	1900 (183)	3000	LQM (2014)
Phenanthrene	95	220	440	1300 (36)	1500	1500	15	38	90	22000	22000	23000	3100	3100	3100	6200	6200	6300	LQM (2014)
Pyrene	620	1200	2000	3700	3800	3800	110	270	620	54000	54000	54000	7400	7400	7400	15000	15000	15000	LQM (2014)
Coal Tar (BaP as surrogate marker)	0.79	0.98	1.1	1.2	1.2	1.2	0.32	0.67	1.2	15	15	15	2.2	2.2	2.2	4.4	4.7	4.8	LQM (2014)
BTEX and TPH																			
Benzene	0.087	0.17	0.37	0.38	0.7	1.4	0.017	0.034	0.075	27	47	90	72	72	73	90	100	110	LQM (2014)
Toluene	130	290	660	880 vap (869)	1900	3900	22	51	120	56000 vap (869)	110000 vap (1920)	180000 vap (4360)	56000	56000	56000	87000 vap (869)	95000 vap (1920)	100000 vap (4360)	LQM (2014)
Ethylbenzene	47	110	260	83	190	440	16	39	91	5700 vap (518)	13000 vap (1220)	27000 vap (2840)	24000	24000	25000	17000 vap (518)	22000 vap (1220)	27000 vap (2840)	LQM (2014)
Xylene - o	60	140	330	88	210	480	28	67	160	6600 (478)	15000 (1120)	33000 (2620)	41000	42000	43000	17000 (478)	24000 (1120)	33000 (2620)	LQM (2014)
Xylene - m	59	140	320	82	190	450	31	74	170	6200 (625)	14000 (1470)	31000 (3460)	41000	42000	43000	17000 (625)	24000 (1470)	32000 (3460)	LQM (2014)
Xylene - p	56	130	310	79	180	430	29	69	160	5900 (576)	14000 (1350)	30000 (3170)	41000	42000	43000	17000 (576)	23000 (1350)	31000 (3170)	LQM (2014)
Aliphatic EC 5-6	42	78	160	42	78	160	730	1700	3900	3200 (304)	5900 (558)	12000 (1150)	570000 (304)	590000	600000	95000 (304)	130000 (558)	180000 (1150)	LQM (2014)
Aliphatic EC >6-8	100	230	530	100	230	530	2300	5600	13000	7800 (144)	17000 (322)	40000 (736)	600000	610000	620000	150000 (144)	220000 (322)	320000 (736)	LQM (2014)

Parameter	Residential <u>with</u> homegrown produce			Residential <u>without</u> homegrown produce			Allotment			Commercial / Industrial			Public Open Space near Residential			Public Open Space - Park			Source
	(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)						
SOM	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	
Aliphatic EC >8-10	27	65	150	27	65	150	320	770	1700	2000 (78)	4800 (190)	11000 (451)	13000	13000	13000	14000 (78)	18000 (190)	21000 (451)	LQM (2014)
Aliphatic EC >10-12	130 (48)	330 (118)	760 (283)	130 (48)	330 (118)	760 (283)	2200	4400	7300	9700 (48)	23000 (118)	47000 (283)	13000	13000	13000	21000 (48)	23000 (118)	24000(2 83)	LQM (2014)
Aliphatic EC >12-16	1100 (24)	2400 (59)	4300 (142)	1100 (24)	2400 (59)	4300 (142)	11000	13000	13000	59000 (24)	82000 (59)	90000 (142)	13000	13000	13000	25000 (24)	25000 (59)	26000 (142)	LQM (2014)
Aliphatic EC >16-35	65000 (8.48)	92000 (21)	110000	65000 (8.48)	92000 (21)	110000	260000	270000	270000	1600000	1700000	1800000	250000	250000	250000	450000	480000	490000	LQM (2014)
Aliphatic EC >35-44	65000 (8.48)	92000 (21)	110000	65000 (8.48)	92000 (21)	110000	260000	270000	270000	1600000	1700000	1800000	250000	250000	250000	450000	480000	490000	LQM (2014)
Aromatic EC 5-7	70	140	300	370	690	1400	13	27	57	26000 (1220)	46000 (2260)	86000 (4710)	56000	56000	56000	76000 (1220)	84000 (2260)	92000 (4710)	LQM (2014)
Aromatic EC >7-8	130	290	660	860	1800	3900	22	51	120	56000 (869)	110000 (1920)	180000 (4360)	56000	56000	56000	87000 (869)	95000 (1920)	100000 (4360)	LQM (2014)
Aromatic EC >8-10	34	83	190	47	110	270	8.6	21	51	3500 (613)	8100 (1500)	17000 (3580)	5000	5000	5000	7200 (613)	8500 (1500)	9300 (3580)	LQM (2014)
Aromatic EC >10-12	74	180	380	250	590	1200	13	31	74	16000 (364)	28000 (899)	34000 (2150)	5000	5000	5000	9200 (364)	9700 (899)	10000	LQM (2014)
Aromatic EC >12-16	140	330	660	1800	2300 (419)	2500	23	27	130	36000 (169)	37000	38000	5100	5100	5000	10000	10000	10000	LQM (2014)
Aromatic EC >16-21	260	540	930	1900	1900	1900	46	110	260	28000	28000	28000	3800	3800	3800	7600	7700	7800	LQM (2014)
Aromatic EC >21-35	1100	1500	1700	1900	1900	1900	370	820	1600	28000	28000	28000	3800	3800	3800	7800	7800	7900	LQM (2014)

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	(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			
SOM	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	
Aromatic EC >35-44	1100	1500	1700	1900	1900	1900	370	820	1600	28000	28000	28000	3800	3800	3800	7800	7800	7900	LQM (2014)
Aromatic EC >44-75	1600	1800	1900	1900	1900	1900	1200	2100	3000	28000	28000	28000	3800	3800	3800	7800	7800	7900	LQM (2014)
VOCs																			
1,2-dichloroethane (1,2-DCA)	0.0071	0.011	0.019	0.0092	0.013	0.023	0.0046	0.0083	0.016	0.67	0.97	1.7	29	29	29	21	24	28	LQM (2014)
1,1,1-trichloroethane	8.8	18	39	9	18	40	48	110	240	660	1300	3000	140000	140000	140000	57000 (1425)	76000 (2915)	100000 (6392)	LQM (2014)
1,1,2,2,tetrachloroethane	1.6	3.4	7.5	3.9	8	17	0.41	0.89	2	270	550	1100	1400	1400	1400	1800	2100	2300	LQM (2014)
tetrachloroethene	0.18	0.39	0.9	0.18	0.4	0.92	0.65	1.5	3.6	19	45	95	1400	1400	1400	810 (424)	1100 (951)	1500	LQM (2014)
tetrachloromethane (Carbon tetrachloride)	0.026	0.056	0.13	0.026	0.056	0.13	0.45	1	2.4	2.9	6.3	14	890	920	950	190	270	400	LQM (2014)
Trichloroethene	0.016	0.034	0.075	0.017	0.036	0.08	0.041	0.091	0.21	1.2	2.6	5.7	120	120	120	70	91	120	LQM (2014)
Trichloromethane (chloroform)	0.91	1.7	3.4	1.2	2.1	4.2	0.42	0.83	1.7	99	170	350	2500	2500	2500	2600	2800	3100	LQM (2014)
Chloroethene (Vinyl chloride)	0.00064	0.00087	0.0014	0.00077	0.001	0.0015	0.00055	0.001	0.0018	0.059	0.077	0.12	3.5	3.5	3.5	4.8	5	5.4	LQM (2014)
2,4,6 Trinitrotoluene (TNT)	1.6	3.7	8.1	65	66	66	0.24	0.58	1.4	1000	1000	1000	130	130	130	260	270	270	LQM (2014)

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	(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)						
SOM	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	
RDX	120	250	540	13000	13000	13000	17	38	85	210000	210000	210000	26000	26000	27000	49000 (18.7)	51000	53000	LQM (2014)
HMX	5.7	13	26	6700	6700	6700	0.86	1.9	3.9	110000	110000	110000	13000	13000	13000	23000 (0.35)	23000 (0.39)	24000 (0.48)	LQM (2014)
Aldrin	5.7	6.6	7.1	7.3	7.4	7.5	3.2	6.1	9.6	170	170	170	18	18	18	30	31	31	LQM (2014)
Dieldrin	0.97	2	3.5	7	7.3	7.4	0.17	0.41	0.96	170	170	170	18	18	18	30	30	31	LQM (2014)
Atrazine	3.3	7.6	17.4	610	620	620	0.5	1.2	2.7	9300	9400	9400	1200	1200	1200	2300	2400	2400	LQM (2014)
Dichlovos	0.032	0.066	0.014	6.4	6.5	6.6	0.0049	0.01	0.022	140	140	140	16	16	16	26	26	27	LQM (2014)
Alpha-Endosulfan	7.4	18	41	160 (0.003)	280 (0.007)	410 (0.016)	1.2	2.9	6.8	5600 (0.003)	7400 (0.007)	8400 (0.016)	1200	1200	1200	2400	2400	2500	LQM (2014)
alpha- Hexachlorocyclohe xane	0.23	0.55	1.2	6.9	9.2	11	0.035	0.087	0.21	170	180	180	24	24	24	47	48	48	LQM (2014)
beta- hexachlorocyclohe xanes	0.085	0.2	0.46	3.7	3.8	3.8	0.013	0.032	0.077	65	65	65	8.1	8.1	8.1	15	15	16	LQM (2014)
gamma- hexachlorocyclohe xanes	0.06	0.14	0.33	2.9	3.3	3.5	0.0092	0.023	0.054	67	69	70	8.2	8.2	8.2	14	15	15	LQM (2014)
Chlorobenzene	0.46	1	2.4	0.46	1	2.4	5.9	14	32	56	130	290	11000	13000	14000	1300 (675)	2000 (1520)	2900	LQM (2014)
1,2- Dichlorobenzene	23	55	130	24	57	130	94	230	540	2000 (571)	4800 (1370)	11000 (3240)	90000	95000	98000	24000 (571)	36000 (1370)	51000 (3240)	LQM (2014)
1,3- Dichlorobenzene	0.4	1	2.3	0.44	1.1	2.5	0.25	0.6	1.5	30	73	170	300	300	300	390	440	470	LQM (2014)

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SOM	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	
1,4-Dichlorobenzene	61	150	350	61	150	350	15	37	88	4400 (224)	10000 (540)	25000 (1280)	17000	17000	17000	36000 (224)	36000 (540)	36000 (1280)	LQM (2014)
VOCs Continued																			
1,2,3-Trichlorobenzene	1.5	3.6	8.6	1.5	3.7	8.8	4.7	12	28	102	250	590	1800	1800	1800	770 (134)	1100 (330)	1600 (789)	LQM (2014)
1,2,4-Trichlorobenzene	2.6	6.4	15	2.6	6.4	15	55	140	320	220	530	1300	15000	17000	19000	1700 (318)	2600 (786)	4000 (1880)	LQM (2014)
1,3,5-Trichlorobenzene	0.33	0.81	1.9	0.33	0.81	1.9	4.7	12	28	23	55	130	1700	1700	1800	380 (36.7)	580 (90.8)	860 (217)	LQM (2014)
1,2,3,4-Tetrachlorobenzen e	15	36	78	24	56	120	4.4	11	26	1700 (122)	3080 (304)	4400 (728)	830	830	830	1500 (122)	1600	1600	LQM (2014)
1,2,3,5-Tetrachlorobenzen e	0.66	1.6	3.7	0.75	1.9	4.3	0.38	0.9	2.2	49 (39.4)	120 (98.1)	240 (235)	78	79	79	110 (39)	120	130	LQM (2014)
1,2,4,5-Tetrachlorobenzen e	0.33	0.77	1.6	0.73	1.7	3.5	0.06	0.16	0.37	42 (19.7)	72 (49.1)	96	13	13	13	25	26	26	LQM (2014)
Pentachlorobenzen e	5.8	12	22	19	30	38	1.2	3.1	7	640 (43)	770 (107)	830	100	100	100	190	190	190	LQM (2014)
Hexachlorobenzen e	1.8 (0.2)	3.3 (0.5)	4.9	4.1 (0.2)	5.7 (0.5)	6.7 (1.2)	0.47	1.1	2.5	110 (0.2)	120	120	16	16	16	30	30	30	LQM (2014)
Phenol	280	550	1100	750	1300	2300	66	140	280	760 _{dir} (31000)	1500 _{dir} (35000)	3200 _{dir} (37000)	760 _{dir} (31000)	1500 _{dir} (35000)	3200 _{dir} (37000)	760 _{dir} (31000)	1500 _{dir} (35000)	3200 _{dir} (37000)	LQM (2014)

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	(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)						
SOM	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	1%	2.50%	6%	
Chlorophenols (excluding pentachlorophenol)	0.87 (g)	2	4.5	94	150	210	0.13 (g)	0.3	0.7	3500	4000	4300	620	620	620	1100	1100	1100	LQM (2014)
Pentachlorophenol	0.22	0.52	1.2	27 (16.4)	29	31	0.03	0.08	0.19	400	400	400	60	60	60	110	120	120	LQM (2014)
Carbon Disulphide	0.14	0.29	0.62	0.14	0.29	0.62	4.8	10	23	11	22	47	11000	11000	12000	1300	1900	2700	LQM (2014)
Hexachlorobutadie ne	0.29	0.7	1.6	0.32	0.78	1.8	0.25	0.61	1.4	31	66	120	25	25	25	48	50	51	LQM (2014)

(g) derived based on 2,3,4,6-tetrachlorophenol; dir - based on a threshold protective of direct skin contact with phenol (guideline in brackets based on health effects following long term exposure provided for illustration only); (vap) calculated for vapour phase only. SOM - Soil Organic Matter; (4.5) solubility.

