Phase III Remediation & Validation Strategy Proposals

At

Grey Mare Lane, Manchester

Client: Great Places

Reference: 34338-SUT-ZZ-00-RP-G-7301

Date: July 2025

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SUTCLIFFE INVESTIGATIONS

Phase III Remediation & Validation Strategy Proposals

Document Control Sheet

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Rev.	Date	Description	Prepared	Checked	Approved
P01	July 2025	Final Report	DE	DB	WGB
		Signatures:			

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1 Introduction

1.1 Terms of Reference

Sutcliffe Investigations were instructed by Great Places to design an appropriate remediation strategy for the proposed development at Grey Mare Lane, Manchester, M11 3FT.

The site is centred on National Grid Reference (NGR) 386954, 398294. The site area is approximately 0.47ha.

This report provides details on the protocols to be adopted during remedial works required to be undertaken on the site to ensure that any risks associated with long term human health are mitigated.

The soil sampling strategy and chemical analysis proposals set out in this document are produced in light of a Phase I Preliminary Risk Assessment and Phase II Ground Assessment for this site. This report and the outlined strategy should therefore be read in conjunction with:

- e3p Phase I Geoenvironmental Site Assessment Report Ref: 16-908-R1 (June 2023)
- e3p Phase II Geoenvironmental Site Assessment Report Ref: 16-908-R2-1 (June 2024).
- Sutcliffe Phase II Ground Assessment Report Ref. 31440-SUT-ZZ-00-RP-G-7202 (January 2025)
- e3p Ground Gas Addendum Report Ref: 16-908-R3-1 (June 2025).

1.2 Development Proposal & Legislative Context

Development Proposal

The proposed layout is shown in Bowker Sadler Drawing (Ref: 22-049-A-2005). This report has been prepared in support of a planning application to develop the site for housing with associated soft landscaping areas and infrastructure. Based on information received from the architect, it is anticipated that site levels will be retained to facilitate the proposed development option.

Site History

The site was recorded as residential housing in the north and south with an additional large building in the centre noted as ‘nurses’ home’. In circa 1930 residential housing in the west of the site was redeveloped into a Picture Theatre continuing off-site. The Nurses Home was fully redeveloped pre-1977 to construct the club (recently demolished). All buildings were demolished circa 2019, and the site has remained vacant since then.

Due to the historic developments noted across the site, there is a potential for areas of Made Ground across the site. Potential contaminants associated with Made Ground may comprise a wide range of metals, fuels, oils, acids, alkalis and asbestos.

Contamination may be present on site in the form of Silver Chloride, Silver Bromide and Silver Iodide as a result of the site’s historical use in the photographic processing industry.

Chlorine gas also poses a gassing issue, associated with the reduction of photographic chemicals during exposure to light.

Volatile contamination may be present within the Made Ground deposits associated with previous on-site development.

Legislative Context

The presence of contaminants which may pose a risk to human health or the environment, is a material planning consideration and it remains the responsibility of the developer to ensure safe development.

For planning it should be considered whether the site is suitable for its new use, and the responsibility for securing a safe development (including cumulative effects of pollution on health, and the potential sensitivity of the proposed development to adverse effects from pollution,) rests with the developer and/or landowner. Planning is concerned with the site's proposed use not its current use, where the amount of contamination is expected to be low relative to the level of risk. This is the opposite to Part 2A which considers high levels (significant harm) and the current use of the site.

Section 57 of the Environment Act 1995 adds Part 2A (ss.78A-18YC) to the Environmental Protection Act 1990 and contains the legislative framework for identifying and dealing with contaminated land. Where development is undertaken on land which may be affected by contamination, the National Planning Policy Framework, paragraph 120 to 122 considers pollution and remediation. This links the contaminated land regime within the development process.

1.3 Aims & Objectives

This report provides details of the remedial options applicable for a residential development with associated gardens.

It also provides procedures to be implemented, in order to verify the remedial measures. The remediation strategy report is required to provide information to regulatory authorities to satisfy planning conditions relating to contaminated land aspects on the site.

This document outlines Sutcliffe Investigations proposals for Remediation Strategies, and includes the following:

- Validation of installed gas protection measures compliant with a Characteristic Situation 2.
- Validation and verification work relating to "hotspot" removal required on the development site.
- Validation of imported top and sub soils required to facilitate landscape proposals.

2 Land Contamination Risks

2.1 Revised Conceptual Model

Based on the findings of the human health risk assessment as completed by e3p and has been presented within the Ground Assessment Report Ref. 16-908-R2-1 and Ground Gas Addendum Report Ref. 16-908-R3-1.

2.2 Discounted Contaminant Linkages

Groundwater Resources

No contaminant linkages remain for groundwater; therefore, no further action is required.

Surface Water Resources

No contaminant linkages remain for surface water; therefore, no further action is required.

2.3 Remaining Potential Contaminant Linkages

Long Term Human Health

Site wide elevated concentrations of lead and some PAH compounds were identified within both natural and Made Ground deposits. However, these can be mitigated via the use of cover systems across the site in proposed landscaping areas.

The elevated mercury concentration has only been identified within one area of the site (TP103, within shallow soils) and is therefore considered to be a localised hotspot. During a process of cut/fill enabling works, a hotspot removal should be undertaken where these soils may be chemically validated to assess chemical suitability for retention on site in an area of no future sensitivity.

Ground Gas

In accordance with e3p Ground Gas Addendum Report, it is recommended that installation of gas protection measures in accordance with BS 8485:2015 + A1:2019 for Characteristic Situation 2 (CS2) is considered appropriate.

It is recommended that the full ground gas assessment and recommended protection measures (if applicable) are agreed with the local authority prior to their adoption on site. Furthermore, all protection measures adopted should be validated by a suitably qualified engineer.

Table 2.1: BS8485 (2015+A1:2019) Point Score Summary

GAS PROTECTION SCORES FOR THE STRUCTURAL BARRIER	
Floor and substructure design	SCORE
Precast suspended segmental subfloor (i.e. beam and block)	**0**

GAS PROTECTION SCORES FOR VENTILATION PROTECTION MEASURES			
Protection Element System		Comments	SCORE
Passive sub floor dispersal layer: Media used to provide the dispersal layer are: - Clear void; - Polystyrene void former blanket; - Geocomposite void former blanket; - No-fines gravel layer with gas drains; - No-fines gravel layer.	Very good performance	- The ventilation effectiveness of different media depends on a number of different factors including the transmissivity of the medium, the width of the building, the side ventilation spacing and type and the thickness of the layer. - The selected score should be assigned taking into account the recommendations in Annex B of BS8485:2015. - Passive ventilation should be designed to meet at least "good performance".	**2.5**

GAS PROTECTION SCORE FOR THE GAS RESISTANT MEMBRANE		
Protection Element System	Comments	SCORE
Gas resistant membrane meeting all of the following criteria: - Sufficiently impervious to the gases with a methane gas transmission rate <40.0 ml/day/m2/atm (average) for sheet and joints (tested in accordance with BS ISO 15105-1 manometric method; - Sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions; - Sufficiently strong to withstand in-service stresses (e.g. settlement if placed below a floor slab); - Sufficiently strong to withstand the installation process and following trades until covered (e.g. penetration from steel fibres in fibre reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools etc); - Capable, after installation, of providing a complete barrier to the entry of the relevant gas; and, - Verified in accordance with CIRIA C735.	The performance of membranes is heavily dependent on the quality and design of the installation, resistance to damage after installation and integrity of joints. For example, a minimum 0.40mm thickness (equivalent to 370g/m^2 for polyethylene) reinforced membrane (virgin polymer) meets the performance criteria opposite. If a membrane is installed that does not meet all the criteria opposite, then the score is zero.	**2**

Certification that these passive protection measures have been installed correctly should be provided.

As the radon risk is classified within Radon Class 4, the proposed development will require a specialised Radon Membrane, with minimum thickness of 0.40mm thick (1600 gauge) suitably installed and validated. Notwithstanding, given the development has a recommendation for a ground gas membrane to be installed, this should provide sufficient protection for Radon Gas.

3 Remediation Strategy

3.1 Overview

The recommendations provided below are considered appropriate for the site based on the site investigation and the combined risk assessments completed by e3p (controlled waters, ground gas and long-term human health) and details recommended remediation and validation works.

3.2 Additional Works Required to Assess Outstanding Contaminant Linkages

No additional works are required to assess outstanding contaminant linkage.

3.3 Regulatory Approval

Consultation with Manchester City Council Contaminated Land Officer is recommended regarding the acceptability of the validation proposal.

Council validation requirements are presented in *Appendix C.*

3.4 Remedial Works

Development Area

Given the extent of the identified contamination a site strip will be required to a depth of 300mm, with a clean validated capping layer being placed in soft landscaped areas to bring site levels back up.

Elsewhere on site (areas of hardstanding) reduced site levels will be as per foundation design given the extent of contamination and the identified long term human health risks, remedial works will be required to ensure that the site is “fit for purpose”, assuming a residential (without plant uptake) end use.

It would be anticipated that the remainder of the site that is not formed of landscaping will be covered by hardstanding, this along with the capping system would provide a break layer to source pathway receptor linkages.

Human Health - Ground Gas

Ground gas monitoring has indicated elevated levels of Carbon Dioxide and Methane on site and due to the highest recorded concentrations of these it is recommended that the site is classified as an CS2 as outlined in CIRIA C665. As such gas protection measures will be required as part of the development of the site.

Gas protection measures should include a ventilated sub-floor void and a suitable gas membrane in accordance with the requirements of BS8485:2015+A1:2019 as set out in Table 2.1 of this report.

An example of a suitable gas protection membrane and a membrane validation pro forma are presented in Appendix B.

3.5 Proposed Capping Thickness – Soft Landscaping Area

Following the excavation of existing material to a depth of 300mm bgl in the development area to facilitate the removal of contamination, levels will need to be raised.

Reinstatement to achieve finished site levels will be required and will include the importation of clean validated top and sub soils, comprising a geotextile membrane, 150mm subsoil, overlain by minimum 150mm topsoil in the development area.

3.6 Soil Validation Sampling & Testing

Soil Sampling

In accordance with the current requirements of the regulatory authorities, validation samples will be collected from all materials that are to be subject to movement and reuse under the protocols outlined within this Remediation Strategy, or for materials to be imported onto site to facilitate the proposed residential development.

Upon removal of the hotspot of unsuitable made ground in the southern sector, validation samples will be collected from the base and sidewalls (numbers dependent on the size of the hot spot) of the excavation to reasonably demonstrate no residual impact to the underlying strata.

Soil samples destined for chemical analysis will be collected at regular intervals in appropriate sampling containers. All samples will subsequently be stored in cooled boxes prior to submission to a UKAS / MCERTS accredited laboratory.

All samples will be collected using appropriate PPE and sampling equipment that will be cleaned at each sampling location.

Where material is found to contain concentrations of potential contaminants at levels in excess of the site-specific screening criteria the excavation will be extended, and further sampling undertaken.

The sampling frequency for materials to be managed under the Remediation Strategy is presented within *Table 3.1* and *Table 3.2*.

Table 3.1: Testing Frequency for Material Use on Site (Imported)

Material Use	Testing Frequency
Subsoil Greenfield Source *(150mm landscaping cover)*	1 Sample per 200m^3 (Minimum 3 samples)
Subsoil Brownfield Source *(150mm landscaping cover)*	1 Sample per 50m^3 (Minimum 3 samples)
Topsoil Greenfield Source *(150mm landscaping cover)*	1 Sample per 200m^3 (Minimum 3 samples)
Topsoil Brownfield Source *(150mm landscaping cover)*	1 Sample per 50m^3 (Minimum 3 samples)

Table 3.2: Testing Frequency for Material Use on Site (Site Generated)

Material Use	Testing Frequency
Site Generated 6F2	1 Sample Per 1000m^3 (Minimum 3 samples)
Site Won Made Ground General Backfill	1 Sample Per 250m^3 (Minimum 3 samples)

Material Use	Testing Frequency
Site Won Natural Backfill	1 Sample Per 2000m^3 (Minimum 3 samples)
Site generated Sub-Soil *(150mm landscaping cover)*	1 Sample Per 250m^3 (Minimum 3 samples)
Site Generated Topsoil Cover *(150mm landscaping cover)*	1 Sample per 50m^3 (Minimum 3 samples)
Hotspot Validation Samples	1 Sample per 10m of linear excavation to base and sidewall.

Imported Soil Validation Testing

Imported material needs to be compliant with BS3882: 2015 Specification for Topsoil and BS8601: 2013 Specification for Subsoil and requirements for use.

The typical testing suite will comprise:

Arsenic, boron, cadmium, chromium (total and hexavalent), copper, lead, mercury, nickel, selenium, vanadium, zinc, water soluble sulphate, pH, USEPA PAH 16, asbestos (presence or absence) and organic matter.

Where the source is 'brownfield' or to site source unknown, the soil will additionally be tested for the following:

Speciated banded petroleum hydrocarbons (TPHCWG), benzene, toluene, ethylbenzene and xylene (BTEX), MTBE, cyanide suite, boron and phenol.

Site Generated Soil Validation Testing

The typical testing suite will comprise:

Arsenic, boron, cadmium, chromium (total and hexavalent), copper, lead, mercury, nickel, selenium, vanadium, zinc, water soluble sulphate, pH, USEPA PAH 16, asbestos (presence or absence) and organic matter, speciated banded petroleum hydrocarbons (TPHCWG), benzene, toluene, ethylbenzene and xylene (BTEX), MTBE, cyanide suite, boron and phenol.

Dependant on this additional sampling and assessment consideration will be given to its emplacement within soft landscaping areas.

3.7 Soil Validation Criteria

Generic Soil Assessment Criteria – Imported Top & Sub soils

The results of the topsoil and subsoil samples may be contrasted to contemporary UK soil assessment criteria.

With regards to the soil risk assessment for imported top and sub soils Sutcliffe will use the following hierarchy:

- LQM Suitable 4 Use Levels (S4ULs).
- ATRISK Soil Screening Values (SSVs) and DEFRA Generic Assessment Criteria (GACs).
- DEFRA Category 4 Screening Levels (C4SLs) for Lead.

Based upon the above we will use the LQM S4ULs. These use similar assumptions and land uses to C4SLs. However, toxicological information has been based on 'minimal risk' as per previous guidelines and assumptions.

If contaminants are not present as S4ULs, then we propose to use ATRISK SSVs or CL:AIRE GACs. These follow the 'minimal' risk principle and more stringent exposure parameters and will be conservative. The only exception to this is for Lead where the C4SL is used.

3.8 Capping Layer Depth Validation

The depth of the capping layer on site will be demonstrated by excavating a hole and collecting photographic evidence. The photographs will show the location of the validation, the downhole view and the depth using a levelling staff.

3.9 Site Completion Report

The site completion report will include details of the imported soil validation and photographs of the soil depth placed across the site.

The site wide planning conditions may only be discharged once Manchester City Council are satisfied that, in accordance with the National Planning Policy Framework (NPPF):

- The site is suitable for its new use
- Adequate site investigation information, prepared by a competent person, is presented.

3.10 Additional Remedial Requirements

Site Material Management Plan (SMMP)

It is advised that an appropriate SMMP is designed for the scheme and prior to the commencement of any works and maintained throughout the development of the scheme. All waste transfer notes will need to be retained and documented to allow ease of review by the regulators.

Material Reuse

Should any material from the site be reused an assessment for suitability for use would be required. Sampling protocols to be implemented on receipt of agreement with the Manchester Council EHD are detailed in *Section 3*.

Unexpected Contamination

In the event that during the development works if unexpected contamination is identified then all works should cease and the appointed environmental consultant notified.

Documentation

On completion of the remedial works detailed within *Section 3.4* of this report, a Phase IV Completion Report will be required and will need to include the following documentation:

- Waste consignment notes for contaminated material removed from site, including details of the recipient waste facility.
- Consignment notes for top/sub soils imported to site.
- Photographic log of the gas membrane installation.
- Independent certification of guarantee from third party confirming the suitability of gas membrane installation.

Appendix A – Analytical Results

envirolab
Hattersley Science & Technology Park
Stockport Road, Hattersley, SK14 3QU

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 25/00047
Issue Number: 1 **Date:** 14 January, 2025

Client: Sutcliffe
18-20 Harrington Street
Liverpool
L2 9QA

Project Manager: (use) D Evans; D Bowen; A Tosh; W Baldwin/(use)Sar
Project Name: Grey Mare Lane (2 Sites)
Project Ref: 34338LG
Order No: 10673
Date Samples Received: 13/12/24
Date Instructions Received: 06/01/25
Date Analysis Completed: 14/01/25

Approved by:



Richard Wong
Client Manager

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
UKAS TESTING 1247

Envirolab Job Number: 25/00047

Client Project Name: Grey Mare Lane (2 Sites)

Client Project Ref: 34338LG

Lab Sample ID	25/00047/1	25/00047/2	25/00047/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH101	BH102	BH103							
Depth to Top	0.50	0.40	0.60							
Depth To Bottom	0.80	0.80	0.90							
Date Sampled	12-Dec-24	12-Dec-24	12-Dec-24							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	3AE	3A	4AED							
% Moisture at <40C$_A$	14.9	16.1	11.0					% w/w	0.1	A-T-044
% Stones >10mm$_A$	<0.1	<0.1	<0.1					% w/w	0.1	A-T-044
pH$_D^{M\#}$	8.65	8.84	11.29					pH	0.01	A-T-031s
Arsenic$_D^{M\#}$	2	3	5					mg/kg	1	A-T-024s
Cadmium$_D^{M\#}$	<0.5	<0.5	0.8					mg/kg	0.5	A-T-024s
Copper$_D^{M\#}$	20	23	25					mg/kg	1	A-T-024s
Chromium$_D^{M\#}$	24	27	16					mg/kg	1	A-T-024s
Chromium (hexavalent)$_D$	<1	<1	<1					mg/kg	1	A-T-040s
Lead$_D^{M\#}$	11	16	56					mg/kg	1	A-T-024s
Mercury$_D$	<0.17	<0.17	<0.17					mg/kg	0.17	A-T-024s
Nickel$_D^{M\#}$	26	29	13					mg/kg	1	A-T-024s
Selenium$_D^{M\#}$	<1	<1	<1					mg/kg	1	A-T-024s
Zinc$_D^{M\#}$	54	56	111					mg/kg	5	A-T-024s

Envirolab Job Number: 25/00047

Client Project Name: Grey Mare Lane (2 Sites)

Client Project Ref: 34338LG

Lab Sample ID	25/00047/1	25/00047/2	25/00047/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH101	BH102	BH103							
Depth to Top	0.50	0.40	0.60							
Depth To Bottom	0.80	0.80	0.90							
Date Sampled	12-Dec-24	12-Dec-24	12-Dec-24							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	3AE	3A	4AED							
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_{D}^{\#}$	NAD	NAD	NAD							A-T-045
Asbestos Matrix (visual)$_{D}$	-	-	-							A-T-045
Asbestos Matrix (microscope)$_{D}$	-	-	-							A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_{D}$	N/A	N/A	N/A							A-T-045

Envirolab Job Number: 25/00047

Client Project Name: Grey Mare Lane (2 Sites)

Client Project Ref: 34338LG

Lab Sample ID	25/00047/1	25/00047/2	25/00047/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH101	BH102	BH103							
Depth to Top	0.50	0.40	0.60							
Depth To Bottom	0.80	0.80	0.90							
Date Sampled	12-Dec-24	12-Dec-24	12-Dec-24							
Sample Type	SOIL - ES	SOIL - ES	SOIL - ES							
Sample Matrix Code	3AE	3A	4AED							
PAH-16MS										
Acenaphthene$_{A}^{M\#}$	<0.01	0.05	<0.10					mg/kg	0.01	A-T-019s
Acenaphthylene$_{A}^{M\#}$	<0.01	<0.01	<0.10					mg/kg	0.01	A-T-019s
Anthracene$_{A}^{M\#}$	<0.02	0.06	<0.20					mg/kg	0.02	A-T-019s
Benzo(a)anthracene$_{A}^{M\#}$	<0.04	0.13	<0.40					mg/kg	0.04	A-T-019s
Benzo(a)pyrene$_{A}^{M\#}$	<0.04	0.10	<0.40					mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene$_{A}^{M\#}$	<0.05	0.10	<0.50					mg/kg	0.05	A-T-019s
Benzo(ghi)perylene$_{A}^{M\#}$	<0.05	<0.05	<0.50					mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene$_{A}^{M\#}$	<0.07	<0.07	<0.70					mg/kg	0.07	A-T-019s
Chrysene$_{A}^{M\#}$	<0.06	0.17	<0.60					mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene$_{A}^{M\#}$	<0.04	<0.04	<0.40					mg/kg	0.04	A-T-019s
Fluoranthene$_{A}^{M\#}$	<0.08	0.37	<0.80					mg/kg	0.08	A-T-019s
Fluorene$_{A}^{M\#}$	<0.01	0.02	<0.10					mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene$_{A}^{M\#}$	<0.03	0.06	<0.30					mg/kg	0.03	A-T-019s
Naphthalene $_{A}^{M\#}$	<0.03	<0.03	<0.30					mg/kg	0.03	A-T-019s
Phenanthrene$_{A}^{M\#}$	<0.03	0.32	<0.30					mg/kg	0.03	A-T-019s
Pyrene$_{A}^{M\#}$	<0.07	0.33	<0.70					mg/kg	0.07	A-T-019s
Total PAH-16MS$_{A}^{M\#}$	<0.08	1.71	<0.80					mg/kg	0.01	A-T-019s
TPH Total with ID + GC Trace										
TPH total (>C6-C40)$_{A}^{M\#}$	16	703	397					mg/kg	10	A-T-007s
TPH FID Chromatogram$_{A}$	Appended	Appended	Appended							A-T-007s
TPH ID Interpretation$_{A}$	C12-C44 hydrocarbons with unknown profile	C6-C44 with PAHs plus other unknown hydrocarbons	C16-C44 hydrocarbons with unknown profile							A-T-007s

Report Notes

General

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

Key

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

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis
"Trace Asbestos Identified" will be reported if there is not enough present to verify the type.
Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). "TRACE" will be reported as a quantification result.
PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

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

Soil Chemical Analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH by method A-T-007:
For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.
Results "with Clean up" indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:
EPH CWG results have humics mathematically subtracted through instrument calculation.
Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:
Results greater than 12900µS/cm @ 25^0C / 11550µS/cm @ 20^0C fall outside the calibration range and as such are unaccredited.

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

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Sutcliffe, 18-20 Harrington Street, Liverpool, L2 9QA

Project No: 25/00047

Date Received: 06/01/2025 (am)

Project: Grey Mare Lane (2 Sites)

Cool Box Temperatures (°C): 13.1

Clients Project No: 34338LG

Lab Sample ID	25/00047/1	25/00047/2	25/00047/3
Client Sample No			
Client Sample ID/Depth	BH101 0.50-0.80m	BH102 0.40-0.80m	BH103 0.60-0.90m
Date Sampled	12/12/24	12/12/24	12/12/24
Deviation Code			
F	✓	✓	✓

Key
F *Maximum holding time exceeded between sampling date and analysis for analytes listed below*

HOLDING TIME EXCEEDANCES

Lab Sample ID	25/00047/1	25/00047/2	25/00047/3
Client Sample No			
Client Sample ID/Depth	BH101 0.50-0.80m	BH102 0.40-0.80m	BH103 0.60-0.90m
Date Sampled	12/12/24	12/12/24	12/12/24
PAH-16MS	✓	✓	✓
TPH Total with ID + GC Trace	✓	✓	✓
PAH (total 17)	✓	✓	✓
BTEX (total)	✓	✓	✓

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	25/00047/1	25/00047/2	25/00047/3
Client Sample No			
Client Sample ID/Depth	BH101 0.50-0.80m	BH102 0.40-0.80m	BH103 0.60-0.90m
Date Sampled	12/12/24	12/12/24	12/12/24
A-T-004s	08/01/2025	08/01/2025	08/01/2025
A-T-007s	14/01/2025	14/01/2025	14/01/2025
A-T-019s	08/01/2025	08/01/2025	08/01/2025
A-T-022s	08/01/2025	08/01/2025	08/01/2025
A-T-024s	08/01/2025	08/01/2025	08/01/2025
A-T-025w	09/01/2025	09/01/2025	09/01/2025
A-T-026w	09/01/2025	09/01/2025	09/01/2025
A-T-026w (F)	09/01/2025	09/01/2025	09/01/2025
A-T-030s	08/01/2025	08/01/2025	08/01/2025
A-T-031s	08/01/2025	08/01/2025	08/01/2025
A-T-031w	09/01/2025	09/01/2025	09/01/2025
A-T-032s	09/01/2025	09/01/2025	09/01/2025
A-T-032w	09/01/2025	09/01/2025	09/01/2025
A-T-037w	09/01/2025	09/01/2025	09/01/2025
A-T-040s	08/01/2025	08/01/2025	08/01/2025
A-T-044	08/01/2025	08/01/2025	08/01/2025
A-T-045	07/01/2025	07/01/2025	07/01/2025
A-T-050w	09/01/2025	09/01/2025	09/01/2025
A-T-ANCs	08/01/2025	08/01/2025	08/01/2025
Calc	08/01/2025	08/01/2025	08/01/2025
Calc-no stones	09/01/2025	09/01/2025	09/01/2025
Probe (w)	09/01/2025	09/01/2025	09/01/2025

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

End of Report

Sutcliffe	**SUTCLIFFE INVESTIGATIONS** TEL: 0151 227 3155 FAX: 0151 227 3156		**Long Term Human Health Risk Assessment**				
	Job Name:	0	**Job No.:**	0			
	Proposed Land Use:	Residential With Plant Uptake	**S.O.M. (%):**	1.0			
	Legend		**Sample Details**				
	Above Threshold:		**Lab Sample Ref.:**		25/00047/1	25/00047/2	25/00047/3
	Below Limit of Detection:	<0.01	**Depth Top (m bgl):**		0.50	0.40	0.60
	Not Tested:	n/t	**Depth Base (m bgl):**		0.80	0.80	0.90
	No Asbestos Detected:	NAD	**Date Sampled:**		12-Dec-24	12-Dec-24	12-Dec-24
	Contaminant	**Units**	**Threshold Source**	**Threshold Value**	**BH101**	**BH102**	**BH103**
Metals / Non-Metals / Other Suite	Arsenic (Total)	mg/kg	LQM S4UL	37	2	3	5
	Boron (Soluble)	mg/kg	LQM S4UL	290	n/t	n/t	n/t
	Cadmium (Total)	mg/kg	LQM S4UL	11	<0.5	<0.5	0.8
	Chromium III	mg/kg	LQM S4UL	910	n/t	n/t	n/t
	Chromium VI	mg/kg	LQM S4UL	6	<1	<1	<1
	Copper (Total)	mg/kg	LQM S4UL	2400	20	23	25
	Lead (Total)	mg/kg	C4SL	200	11	16	56
	Mercury (Total)	mg/kg	LQM S4UL	40	<0.17	<0.17	<0.17
	Nickel (Total)	mg/kg	LQM S4UL	130	26	29	13
	Selenium (Total)	mg/kg	LQM S4UL	250	<1	<1	<1
	Zinc (Total)	mg/kg	LQM S4UL	3700	54	56	111
	Cyanide (Total)	mg/kg	ATKINS	34	n/t	n/t	n/t
	Phenols (Total)	mg/kg	LQM S4UL	120	n/t	n/t	n/t
	Organic matter	%	LQM S4UL	N/a	n/t	n/t	n/t
	Sulphate (Acid Soluble)	mg/kg	LQM S4UL	N/a	n/t	n/t	n/t
	Sulphate as Water Soluble	g/l	LQM S4UL	N/a	n/t	n/t	n/t
	Sulphide	mg/kg	LQM S4UL	N/a	n/t	n/t	n/t
	pH	pH units	LQM S4UL	N/a	8.65	8.84	11.29
	Sulphur (Elemental)	mg/kg	LQM S4UL	N/a	n/t	n/t	n/t
Asbestos Suite	Asbestos in soil	N/a	-	N/a	NAD	NAD	NAD
	Asbestos Matrix (visual)	N/a	-	N/a	n/t	n/t	n/t
	Asbestos Matrix (microscope)	N/a	-	N/a	n/t	n/t	n/t
	Suitable for Water Absorption Test?	N/a	-	N/a	n/t	n/t	n/t
	Asbestos Quantification	% w/w	-	0.001	n/t	n/t	n/t
TPH Suite	C5 to C6 aliphatic	mg/kg	LQM S4UL	42	n/t	n/t	n/t
	C6 to C8 aliphatic	mg/kg	LQM S4UL	100	n/t	n/t	n/t
	C8 to C10 aliphatic	mg/kg	LQM S4UL	27	n/t	n/t	n/t
	C10 to C12 aliphatic	mg/kg	LQM S4UL	130	n/t	n/t	n/t
	C12 to C16 aliphatic	mg/kg	LQM S4UL	1100	n/t	n/t	n/t
	C16 to C21 aliphatic	mg/kg	-	N/a	n/t	n/t	n/t
	C21 to C35 aliphatic	mg/kg	-	N/a	n/t	n/t	n/t
	C16 to C35 aliphatic (as Calc.)	mg/kg	LQM S4UL	65000	n/t	n/t	n/t
	C35 to C44 aliphatic	mg/kg	LQM S4UL	65000	n/t	n/t	n/t
	Total Aliphatic	mg/kg	-	N/a	n/t	n/t	n/t
	C5 to C7 aromatic (Benzene)	mg/kg	LQM S4UL	70	n/t	n/t	n/t
	C7 to C8 aromatic (Toluene)	mg/kg	LQM S4UL	130	n/t	n/t	n/t
	C8 to C10 aromatic	mg/kg	LQM S4UL	34	n/t	n/t	n/t
	C10 to C12 aromatic	mg/kg	LQM S4UL	74	n/t	n/t	n/t
	C12 to C16 aromatic	mg/kg	LQM S4UL	140	n/t	n/t	n/t
	C16 to C21 aromatic	mg/kg	LQM S4UL	260	n/t	n/t	n/t
	C21 to C35 aromatic	mg/kg	LQM S4UL	1100	n/t	n/t	n/t
	C35 to C44 aromatic	mg/kg	LQM S4UL	1100	n/t	n/t	n/t
	Total Aromatic	mg/kg	-	N/a	n/t	n/t	n/t
	TPH (Total)	mg/kg	-	N/a	16	703	397
BTEX Suite	benzene	mg/kg	LQM S4UL	0.87	n/t	n/t	n/t
	toluene	mg/kg	LQM S4UL	130	n/t	n/t	n/t
	ethylbenzene	mg/kg	LQM S4UL	47	n/t	n/t	n/t
	M&P Xylene	mg/kg	LQM S4UL	56	n/t	n/t	n/t
	O-Xylene	mg/kg	LQM S4UL	60	n/t	n/t	n/t
PAH Suite	naphthalene	mg/kg	LQM S4UL	2.3	<0.03	<0.03	<0.30
	acenaphthylene	mg/kg	LQM S4UL	170	<0.01	<0.01	<0.10
	acenaphthene	mg/kg	LQM S4UL	210	<0.01	0.05	<0.10
	fluorene	mg/kg	LQM S4UL	170	<0.01	0.02	<0.10
	phenanthrene	mg/kg	LQM S4UL	95	<0.03	0.32	<0.30
	anthracene	mg/kg	LQM S4UL	2400	<0.02	0.06	<0.20
	fluoranthene	mg/kg	LQM S4UL	280	<0.08	0.37	<0.80
	pyrene	mg/kg	LQM S4UL	620	<0.07	0.33	<0.70
	benzo(a)anthracene	mg/kg	LQM S4UL	7.2	<0.04	0.13	<0.40
	chrysene	mg/kg	LQM S4UL	15	<0.06	0.17	<0.60
	benzo(b)fluoranthene	mg/kg	LQM S4UL	2.6	<0.05	0.1	<0.50
	benzo(k)fluoranthene	mg/kg	LQM S4UL	77	<0.07	<0.07	<0.70
	benzo(a)pyrene	mg/kg	LQM S4UL	2.2	<0.04	0.1	<0.40
	dibenzo(ah)anthracene	mg/kg	LQM S4UL	0.24	<0.04	<0.04	<0.40
	benzo(ghi)perylene	mg/kg	LQM S4UL	320	<0.05	<0.05	<0.50
	indeno(123cd)pyrene	mg/kg	LQM S4UL	27	<0.03	0.06	<0.30

Appendix B – Gas Protection Membrane Specification & Membrane Validation Proforma

Protech GM Super

GAS PROTECTION

• HIGH RISK CHARACTERISTIC SITES •

REGULATIONS COMPATIBILITY TABLE

	CIRIA 665 CHARACTERISTIC SITUATION 2	CIRIA 665 CHARACTERISTIC SITUATION 3-6	BS8485 CHARACTERISTIC SITUATION 2	BS8485 CHARACTERISTIC SITUATION 3-6	BRE 211 RADON	NHBC AMBER 1	NHBC AMBER 2 & RED
METHANE	✓	✓	✓	✓	N/A	✓	✓
CARBON DIOXIDE	✓	✓	✓	✓	N/A	✓	✓
RADON	N/A	N/A	N/A	N/A	✓	N/A	N/A

DESCRIPTION

Protech GM Super is a high performance proprietary reinforced gas barrier, that incorporates a 12 micron aluminium foil layer, for maximum protection against ground-borne gases. This has been specifically designed to conform with the latest guidance documents. Due to its unique composition, the membrane is extremely robust and flexible and, therefore, easy to install on site. The membrane also provides protection from damp when placed below the slab and, therefore, there is no need to install a separate DPM.



SPECIFICATION

CIRIA C665, BS8485:2015 & Local Authority Ground Gas Handbook recommended that gas membranes are specified on the basis of the 'need to survive' construction, i.e. use one that is puncture and tear resistant.

Thickness should not be the main determinant of the suitability of a membrane for a particular site, although it can indirectly influence some key performance parameters.

In practise, because of the nature of construction sites, the durability, survivability and robustness of membranes are equally important than purely permeability to gas.

Protech GM Super incorporates a reinforced grid to ensure that maximum protection is achieved when installed to manufacturers' instructions.

The need for high quality workmanship during installation should not be under-estimated. The health and safety of the occupants of the building is dependent on its satisfactory performance. If installed incorrectly or damaged during the construction process, the membrane is rendered ineffective and will fail to provide adequate protection against the ingress of ground gas or vapours.

TYPICAL PROPERTIES	
Roll Length	50m
Width	2m
Weight	370g/m^2
Thickness	0.4mm
Colour	Green / Silver
Methane Permeability (ISO 15105-1)	≤ 0.1 ml/day/m^2

REQUIRED ACCESSORIES

- Protech GM Super Starter Band (1m x 50m)
- Protech GM Tape
- Protech GM Tophats
- Protech SAGM (Self Adhesive Gas Membrane)
- Protech GM Flashing Strip
- Protech GM Super Corner Units
- Protech GM Primer
- Protech GM 3mm Protection Board
- Protech GM Protection Fleece
- Protech 125

VENTING

On sites where venting is required, our Provoid Venting System should be used. We can provide design advice for both passive and active venting systems to suit individual site requirements.

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE 11/4868

BGA British Geomembrane Association

BSI

CE

Revised April 2021

Visual Inspection of Gas Protection Measures

Site Name:	Gas characteristic situation:
Job Number:	Type of development and building/block checked: residential/commercial/other
Date:	Building description:
Visit by:	Foundation type: suspended floor/raft/other
Weather at time of inspection:	Gas protection type: passive/active

No.	Item	Comments (see notes)
1 Gas membrane		
1.1	Condition of sub-grade and underside of gas membrane	
1.2	Gas membrane type	
1.3	Gas membrane condition	
1.4	Joining tape product	
1.5	Lapping design	
1.6	Laps. Welds and joints seals	
1.7	Service entries seals	
2 Passive venting		
2.1	Sub-floor void	
2.2	External wall airbricks	
2.3	Internal sleeper walls	
2.4	External vent trenches/ducts	
3 Active venting		
3.1	System details	
Additional Notes:		

Notes: inspection checklist

1.1	Underside of gas membrane	Check that the sub grade does not contain rough/uneven surfaces, is appropriately clean and that there are no hard/sharp objects. That protective sand blinding or geotextile (if specified) is present and meets the design criteria.
1.2	Gas membrane type	Manufacturer and product specification, gauge, colour, brand/name, material batch/roll numbers, storage arrangements (protected from dirt/damage?)
1.3	Gas membrane condition	Open punctures, tears, rips, stretching? Excessive footprints/evidence of traffic? Presence of debris? Repairs? Signs of weakness such as raised or sunken indentations? Protection plan in place to restrict access to lain gas membrane?
1.4	Joining tape product	Product type, brand, thickness, material, width, colour? Use of double sided tape?
1.5	Lapping design	Joints lapped and sealed in accordance with manufacturer's requirements/ specification? Minimum overlap insured? Sections taped twice?
1.6	Laps and joints sealed	Welds complete? Appropriate joining/double sided tape used?
1.7	Service entries sealed	Top hats seal arrangements fixed around service entries? Use of Jubilee clips?
2.1	Sub-floor void	Is a check possible? Void former? Gravel (type/specification)? Height of void space? Is it clear?
2.2	External wall airbricks	Numbers, size, positions as design drawing?
2.3	Internal sleeper walls	Ventilation holes (honeycomb brickwork/pipe crossings?) – size, spacing, location in accordance with design?
2.4	External vent trenches/ducts	Located and constructed in accordance with design drawings? If open-topped gravel – gravel type/presence of fines? If pipe or other vent, check position and construction for functionality and absence of blockages. Ability of void former to withstand bearing of the superstructure?
3.1	Active venting	Type of air supply: mechanical, natural, combined? Location/condition/number of fans and vents? Location and size of inlets? Provision of air-cleaning devices and air heaters? Supply and exhaust ductwork? Alarm provision/installation? Gas monitoring system in under-floor void?

Photographs

No.	Description

The gas protection measures inspected:	a Are acceptable and comply with the specification
	b Are acceptable but attention is drawn to issues related to item no.
	c Are not acceptable due to issues related to item no.

Name: **Signature:** **Date:**

Appendix C – Council Validation Requirements

MANCHESTER
CITY COUNCIL

Planning & Contaminated Land

Technical Guidance

February 2021

Environmental Protection
Environmental Health
Neighbourhoods Directorate
Manchester City Council

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Service Aim

This guidance aims to provide help and advice in relation to land contamination in a planning context to encourage good practice and mitigation of impacts. It outlines what is expected in relation to current guidance and policy with the aspiration that new developments achieve the highest possible standards without compromising the health and well-being of people that live and work within the City of Manchester.

Applicants, developers, landowners and contaminated land consultants are advised to read this document prior to submitting a planning application.

This document is written to serve as an informative and a helpful source of advice. Readers must note that legislation, guidance and practical methods may be subject to change. The Council has taken all reasonable precautions to ensure the information is correct. However, the Council, its officers, servants, or agents, will not accept any liability for loss or damage caused by any person relying on this information, or for any errors or omissions in the information provided.

Overview

Many areas of the City have previously been occupied by a variety of industrial activities. Historically, the predominant industries included textile and dye works, heavy engineering works, chemical works, gas works and brickworks. In general, early industrialists had little or no knowledge of the environmental effects of their manufacturing processes or operating practices. Consequently, over a period of time a particular site may have been home to a variety of industries, each of which may have left substances in the ground that may be hazardous to human health and the environment. Additionally, more recent activities may also have had a detrimental impact on the environment.

As the Government encourages more redevelopment on brownfield land, developers now have to take into account the possibility of land contamination. The purpose of this guide is to make applicants, developers and their advisors aware of the information that Manchester City Council (MCC) requires in assessing an application for planning consent on land that may be affected by the presence of contamination.

In order to assess submitted information, the Environmental Protection Team would expect a developer to demonstrate that due consideration has been given to the guidance contained within this document.

For more detail on the underpinning principles on which this document is based, the reader is directed to the Land Contamination Risk Management (LCRM) information from the Environment Agency (EA) and the National Planning Policy Framework (NPPF)

This Guidance Note is written to serve as an informative and helpful source of advice. Readers must note that legislation, guidance and practical methods may be subject to change. This Council has taken all reasonable precautions to ensure the information is correct. However, the Council, its officers, servants, or agents, will not accept any liability for loss or damage caused by any person relying on this information, or for any errors or omissions in the information provided.

1.0 What is Contaminated Land

Local Authorities are responsible for addressing land contamination issues within two separate regimes: The Contaminated Land Regime (commonly known as Part 2A) and the Planning Regime (Development Control).

1.1 Definition under Part 2A of the Environmental Protection Act 1990

The definition of contaminated land (from Section 78A(2) of the Environmental Protection Act 1990 (EPA 1990) is; any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that:

a) significant harm is being caused or there is the significant possibility of such harm being caused; or
b) significant pollution of controlled waters is being caused or there is a significant possibility of such pollution being caused

Part 2A of the EPA 1990, as inserted by Section 57 of the Environment Act 1995, was brought into force on 01 April 2000. It requires all local authorities to identify contaminated land in its area and secure its remediation to a condition suitable for its current use.

To fall within the Part 2A definition, the land when assessed in the context of its current use must be capable of causing significant harm to human health or other specified receptors and/or significant pollution of controlled waters. Development of land will have to take into account Part 2A because a change in the use of the land may bring the development inside the statutory definition of contaminated land by creating a pollutant linkage.

A key element of the Part 2A regime is the Source-Pathway-Receptor pollutant linkage concept. Each element is defined as follows:

- The source is the contamination in, on or under the land;
- The pathway is the route by which the contamination reaches the receptor, and;
- The receptor is defined as living organisms, ecological systems or property which may be harmed.

Without the clear identification of all three elements of the pollutant linkage, land cannot be identified as contaminated land under the regime.

1.1.1 Impacts to Human Health

1. Uptake of contaminants by food plants grown in contaminated soil: Heavy metals (e.g. cadmium, lead) and persistent organic pollutants including certain pesticides and veterinary products may result in an accumulation in food plants to concentrations where they exceed legal limits and/or may pose a hazard to human health. Uptake will depend on concentration in soil, its chemical form, soil pH, plant species and prominence in diet.
2. Ingestion and inhalation: Substances may be ingested directly by young children playing on contaminated soil, by eating plants which have absorbed metals or are contaminated with soil or dust. Ingestion may also occur via

contaminated water supplies. Metals, some organic materials and radioactive substances may be inhaled from dusts and soils.

3. Skin contact: Soils containing tars, oils and corrosive substances may cause irritation to the skin through direct contact. Some substances (e.g. phenols) maybe absorbed into the body through the skin or through cuts and abrasions.
4. Irradiation: As well as being inhaled and absorbed through the skin, radioactive materials emitting gamma rays can cause a radiation response at a distance from the material itself.
5. Fire and explosion: Materials such as coal, coke particles, oil, tar, pitch, rubber, plastic and domestic waste are all combustible. If heated by contact with buried power cables or careless disposal of hot ashes they may ignite and burn underground. Both underground fires and biodegradation of organic materials may produce toxic or flammable gases. Methane and other gases may explode if allowed to accumulate in confined spaces.

1.1.2 Impacts to Buildings

1. Fire and explosion: Underground fires may cause ground subsidence and cause structural damage to buildings. Accumulations of flammable gases in confined spaces leads to a risk of explosion. Underground fires may damage building services.
2. Chemical attack on building materials and services: Sulphates may attack concrete structures. Acids, oils and tarry substances may accelerate corrosion of metals or attack plastics, rubber and other polymeric materials used in pipe work and service conduits or as jointing seals and protective coatings to concrete and metals.
3. Physical: Blast-furnace and steel making slag (and some natural materials) may expand if ground conditions are changed by development. Degradation of fills may cause settlement and voids in buried tanks and drums may collapse as corrosion occurs or under loading from construction traffic.

1.1.3 Impacts to the Natural Environment

1. Phytotoxicity (prevention/inhibition of plant growth): Some metals are essential for plant growth at low levels and are phytotoxic at higher concentrations. Methane and other gases may give rise to phytotoxic effects by depleting the oxygen content in the root zone.
2. Contamination of water resources: Soil has a limited capacity to absorb, degrade or attenuate the effects of pollutants. When this is exceeded, polluting substances may enter into surface and groundwater.
3. Ecotoxicological effects: Contaminants in soil may affect microbial, animal and plant populations. Ecosystems or individual species on the site, in surface waters or areas affects by migration from the site may be affected.

1.2 Planning definition

The planning system uses a slightly different definition for contaminated land, which is not based solely on the legal definition set out in Part 2A. A wider range of contamination and receptors is relevant to planning but the degree of harm or pollution and the approach to remediation are essentially the same.

However, to avoid confusion with the term Contaminated Land the planning regime uses the wider term land affected by contamination. This is intended to cover all cases where the actual or suspected presence of substances in, on or under the land may cause risks to people, human activities or the environment, regardless of whether or not the land meets the statutory definition in Part 2A.

The NPPF states that; as a minimum, the land should not be capable of being determined as contaminated land under Part 2A of the EPA 1990

The principal difference is that under the planning system, risks have to be assessed based upon the new or intended use of the land, rather than the existing use.

However, the principles underlying both regimes are fundamentally the same, namely, the identification and remediation of land that may pose a risk to human health and/or the environment.

Typical causes of land contamination include previous industrial or commercial usage, mining, and the landfilling of wastes. Land can also become contaminated due to its proximity to contaminated areas.

Part 2A was designed and intended to encourage voluntary remediation and should only be used where no appropriate alternative solution exists. The Contaminated Land Strategy published by the Council provides details of the planning system to ensure land is made suitable for use when it is redeveloped and/or encouraging polluters and owners of land to deal with problems without the need for Part 2A to be used directly.

1.3 Types of contamination

Contaminating substances may include,

- Metals e.g. cadmium, arsenic, lead, iron, nickel, chromium
- Inorganic compounds e.g. cyanide, ammonium, chlorides
- Organic substances e.g. oils, petrol, solvents, phenols, PAHs, PCBs
- Gases e.g. methane, carbon dioxide, hydrogen sulphide, volatiles
- High or low pH

Contamination may not occur solely as a result of human activities and land can be contaminated as a result of its natural state. For example, in Greater Manchester, marsh gas can cause a contamination problem, particularly in areas previously occupied by moss land.

2.0 Roles and responsibilities

2.1 Role of the Owner/Developer

Where development is proposed, the developer is responsible for ensuring that development is safe and suitable for use for the purpose for which it is intended.

The developer is therefore responsible for determining whether land is suitable for a particular development or can be made so by remedial action. In order to demonstrate this, the developer should determine:

1. Whether the land in question is already affected by contamination through source – pathway – receptor pollutant linkages;
2. Whether the proposed development will create new linkages, e.g. new pathways by which existing contaminants might reach existing or proposed receptors; and
3. What action is needed to break those linkages and avoid new ones, deal with any unacceptable risks and enable safe development and future occupancy of the site and neighbouring land.

A potential developer will need to satisfy the local authority that unacceptable risk from contamination will be successfully addressed through remediation without undue environmental impact during and following the development.

In doing so, a developer should be aware that actions or omissions on their part could lead to liability being incurred under Part 2A, e.g. where development fails to address an existing unacceptable risk or creates such a risk by introducing a new receptor or pathway.

Where an agreed remediation scheme includes future monitoring and maintenance schemes, arrangements will need to be made to ensure that any subsequent owner is fully aware of these requirements and assumes ongoing responsibilities that remain with the new landowner.

2.2 Role of the Local Planning Authority

The Local Planning Authority (LPA) has a duty to take account of all material planning considerations including land contamination during the preparation of Local Plans and when considering an application for planning permission. Usually where there is reason to believe land may be contaminated, or the proposed development is of particular sensitivity e.g. housing, a full assessment may be required in advance of planning approval being issued, and a planning condition requiring assessment of possible contamination may be recommended by the LPA and applied to the decision notice.

When considering development on land affected by contamination, the principal objective of the LPA is to ensure that any unacceptable risks to human health, property and/or the wider environment are identified so that appropriate action can be considered and then taken to address those risks. In achieving this objective, the LPA should assist in providing the necessary confidence to owners and occupiers of the land after development, regarding the condition and the ranking of the land in relation to relevant environmental protection regimes, such as Part 2A.

2.3 Role of the Environmental Protection Team

The Environmental Protection (EP) Team are responsible for addressing land contamination issues using Part 2A and the planning system, and are consulted by the Planning Department on applications within Manchester's district.

EP consider a number of environmental issues, including land contamination, before making a recommendation to the Planning department. Typically this recommendation is that the application either be approved, be approved subject to appropriate conditions, or be refused.

The recommendations made by EP are not binding on the Planning department, who will consider all relevant issues concerning a planning application but land contamination is a material planning consideration that must be taken into account in the decision making process.

2.4 Role of other organisations

The Environment Agency (EA) are a statutory consultee for any planning applications where development is proposed on land potentially affected by contamination. Where the EA are consulted and land contamination is an issue they will seek to implement the objective of the water framework directive to prevent and limit the entry of pollutants into groundwater.

Within the LPA, Building Control will also need to be satisfied that any risks to the development from potential contamination have been adequately addressed. The Building Regulations 2000 require developers to demonstrate that hazards from potential contamination have been properly assessed and appropriate measures put in place to address any risk.

3.0 The planning procedure

The actual or possible presence of contamination is a material planning consideration. Planning advises that as a precautionary approach, the possibility of contamination should be assumed when considering planning applications in relation to all land subject to or adjacent to previous industrial use and also where uses are being considered that are particularly sensitive to contamination, e.g. housing, schools, hospitals and children's play areas.

Where development is proposed on land that is or may be affected by contamination, an assessment of risk should be carried out by the applicant for consideration by the LPA before the application is determined. Any existing or new unacceptable risks should be identified and proposals made to deal with them effectively as part of the development process.

When a planning application is made, the planning officer will consult with the Contaminated Land Section and the application (with supporting information) will be assessed to determine whether there is the potential for contamination to influence the site, whether suitable measures have been proposed to address any risks and whether the proposed development is acceptable.

Other statutory bodies and relevant local authority departments may also be consulted as necessary, including English Nature, Natural England and the departments for building control, conservation and archaeology, and engineering.

If there is the potential for contamination to affect the site, or the end-use is particularly sensitive, recommendations will be made that pre-commencement conditions be imposed upon the development. These are intended to ensure that the site is made suitable for its proposed end use and ensure the safety of site workers, future site users and the protection of the environment.

It is essential that the developer and their agents provide as much information to the LPA at every stage of the planning process. Withholding information, however trivial, may cause a delay to the application. The onus is on the applicant to keep the LPA well informed about the development at all times so that decisions can be made swiftly and the application process completed as quickly as possible.

For large developments on sites where serious contamination is known, or is likely to be present, it is strongly recommended that a pre-application consultation with the LPA be undertaken. It may save both time and money if a thorough pre-application consultation takes place prior to submission of a full planning application. This may result in a site investigation being required to be submitted with the application.

3.1 Pre-commencement conditions

On the 1st October 2018 The Town and Country Planning (Pre-commencement conditions) Regulations 2018 came into force. These regulations mean the local planning authority needs to give notice to applicants when pre-commencement conditions have been recommended. The applicant has 10 working days to accept the pre-commencement conditions (or to challenge them).

With regards to land contamination there is a pre-commencement requirement for sites where there is a risk of contamination being present. This requires the council to be in receipt of; and to agree the findings of a preliminary risk assessment, a site investigation and a remediation strategy prior to works commencing on site.

For some low risk sites we may accept a preliminary risk assessment only but there will still be a post completion element in the form of a validation/site completion report before the condition can be fully discharged.

3.2 Local Planning Policy

Land and water contamination are covered in the Manchester City Council Core Strategy 2012-2027 under EN17 and EN18

3.2.1 Policy EN17 – Water Quality

Development should avoid any adverse impact on water quality, including during the construction phase, and wherever possible should seek to enhance water quality, both chemical and ecological.

Development should minimise surface water run-off from development and associated roads, and maximise the use of appropriate sustainable drainage systems, to minimise groundwater contamination, and to avoid pollutants reaching watercourses.

Development close to a watercourse should also ensure that waste or litter cannot enter the watercourse from the site.

Development should, where feasible and appropriate, seek to open up any culverted or hidden watercourse beneath the site to improve the ecological status of that watercourse.

This will help towards the achievement of the water framework directive by 2027. This policy also gives advise related to Sustainable Urban Drainage Systems (SUDS)

3.2.2 Policy EN18 – Contaminated Land and Ground Stability

The Council will give priority for the remediation of contaminated land to strategic locations as identified within the core strategy. Any proposal for development of contaminated land must be accompanied by a health risk assessment

All new development within former mining areas shall undertake an assessment of any
associated risk to the proposed development and, if necessary, incorporate appropriate mitigation measures to address them

The Council's target is for 90% of new development to be on previously developed land. This is in line with historical trends across Manchester and will ensure a sustainable approach is taken with regard to the use of land as a limited resource.

3.3 National Planning Policy

The National Planning Policy Framework (last updated February 2019) covers Land Contamination in paragraphs 178 and 179.

178. Planning policies and decisions should ensure that:

a. A site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);
b. After remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and
c. Adequate site investigation information, prepared by a competent person, is available to inform these assessments.

179. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

4.0 Criteria used for assessing the submitted information

Information submitted in support of planning applications must be of an acceptable minimum standard in order to satisfy the LPA. The guidance contained within this section aims to inform developers of the procedural requirements of a risk-based approach to land contamination, as defined in current UK legislation and guidance.

A detailed technical framework for investigating and dealing with land affected by contamination is contained within Land Contamination Risk Management (LCRM, published in October 2020). The process involves identifying, making decisions on, and taking appropriate action to deal with, land contamination in a way that is consistent with government policies and legislation within the UK.

The approach outlined in this guidance note is consistent with LCRM and is based on a staged or tiered approach to risk assessment, which includes the following three key elements:

1. Risk Assessment
2. Options Appraisal
3. Remediation and Verification

Risk assessment generally involves developing a conceptual model (Section 4.1), which identifies whether there could be any potentially unacceptable risks at the site. The conceptual model may then be used to determine if any further assessment is required. If this preliminary assessment clearly demonstrates that contamination at the site poses no unacceptable risks (i.e. no source-pathway-receptor relationships) then further assessments may not be required.

The procedure for investigating a potentially contaminated site would be expected to meet the criteria outlined in British Standard (BS) 10175 (2011) Investigation of Potentially Contaminated Sites – Code of Practice. Typical components of a report submitted in support of a planning application would generally include the following four components:

1. Preliminary Risk Assessment (PRA) (often referred to as a Phase 1 Investigation or Desk Study)
2. Phase 2 Investigation (intrusive investigation)
3. Remediation Strategy
4. Verification Report

Points 1-3 are a pre-commencement requirement.

A more detailed checklist of LPA requirements in relation to each of these components can be found in Appendix A.

4.1 Preliminary Risk Assessment

A Preliminary Risk Assessment (PRA) (sometimes referred to as a Phase 1 investigation or Desk Study) should provide a preliminary qualitative assessment of risk by interpreting information on a site's history, considering the likelihood of contamination being present and making an initial hazard assessment. The PRA

typically consists of a desk study, site reconnaissance, development of a conceptual model and a basic hazard assessment.

The desk study comprises a search of available information and historical maps, which can be used to identify the likelihood of contamination being present. The two main indicators for the likely presence of contamination at a site are past industrial uses and/or close proximity to a landfill. A detailed appraisal of documentary research can be found in CLR 3 Documentary Research on Industrial Sites.

A simple site reconnaissance survey of the site is conducted to identify if there are any obvious signs of contamination at the surface. Further information regarding site inspection can be found in CLR 2 Guidance on Preliminary Site Inspection of Contaminated Land.

A conceptual model is a representation (text and/or graphics) of the relationships between contamination sources, pathways and receptors developed on the basis of hazard identification. Developing a conceptual model should be viewed as an iterative process that should be refined during subsequent phases of assessment.

Using the information gathered, the conceptual model of the site is constructed and a basic hazard assessment is carried out.

4.2 Phase 2 investigation

A Phase 2 investigation (site investigation) aims to reduce the uncertainties identified in the initial conceptual model by quantifying potential contamination at the site. The data obtained will be used to inform a decision as to whether the site is potentially harmful. A Phase 2 report generally consists of an intrusive site investigation and a subsequent risk assessment. The investigation process should seek to clearly identify and characterise plausible source-pathway-receptor linkages at the site and provide information for the refinement of the initial conceptual model.

4.3 Remediation strategy

This is a document detailing what action is to be carried out so that contamination no longer presents a risk to site users, property or ecological systems. It may include measures such as the removal of contamination, encapsulation of the contaminants, treatment of the contaminants or measures to break the pollution linkages. Please note that Government policy encourages sustainable methods of remediation.

A remediation strategy should be submitted where a site investigation identifies levels of contamination that will require remediation prior to the site being suitable for its intended use. This statement should include full details of how the contamination problem at the site will be addressed and demonstrate that the standard of remediation work complies with current best practice and guidance. This must be approved by the LPA before any remedial actions at the site commence.

4.4 Verification report

Where contamination has been found and/or remediated, the developer will be required to submit a verification report. In certain circumstances it may be necessary for the developer to conduct post-completion monitoring. This should be undertaken to the approval of the LPA and results of the monitoring should be submitted for review. For limited remediation works or protective works a verification statement alone may be acceptable, but prior confirmation of this should be obtained from the LPA.

The verification report should provide confirmation that all measures outlined in the approved remediation statement have been successfully completed, including where appropriate, validation testing.

Recommendations to discharge land contamination conditions will only be made once the Contaminated Land Section has received and approved a satisfactory verification report.

5.0 Reporting Considerations

The complexity of land contamination technical guidance, coupled with individual site variability, makes it difficult to produce comprehensive guidance applicable to every situation.

However, when assessing the adequacy of a site investigation, a number of common problems frequently arise. These generally relate to areas where technical guidance may be complex or incomplete. In an attempt to minimise the occurrence of these problems, the CLS apply consistent criteria for certain technical aspects of a site investigation. This section is intended to highlight recurring problem areas and key points that are of particular importance.

5.1 Obtaining representative samples

All sampling strategies should be designed to provide data that is representative of the site conditions as a whole. Sampling should be undertaken in accordance with recognised sample collection methodology and guidance, with reference made to recommendations within BS 10175. Reference to the historical site information obtained from the desk study is essential in order to target possible sources of contamination and to ensure that an appropriate suite of analysis is performed. Justification for the chosen sampling regime and analysis suite should be clearly set out in the site investigation report.

5.2 Sample analysis

A suitably accredited laboratory should be used to undertake analysis of samples. The site investigation should include a detailed plan showing the location of sampling points and accreditation details of the laboratory used, together with summary tables of results. A full set of results should be included in the report submitted and an electronic form from the laboratory that undertook the analysis should also be submitted.

5.3 Generic and detailed quantitative risk assessment (GQRA and DQRA)

Defra formally withdrew the 1987 ICRCL trigger and action values in December 2002, following the implementation of the Contaminated Land Exposure Assessment Model (CLEA) and associated publication of the Soil Guideline Values (SGVs).

In 2008, the CLEA UK model and the SGVs were withdrawn by Defra and a revised CLEA model was launched. MCC would expect all future site investigations to make no reference to the withdrawn standards.

Generic and detailed QRA should now be carried out using assessment criteria derived using the new CLEA model (1.06). Where site-specific target levels are used they should be calculated based on suitable and reasonable assumptions as well as current best practice and associated briefing notes and guidance. Reference should also be made to statistical analysis of the resulting data from the intrusive investigation.

More recently the following criteria have been released Category 4 Screening Levels (C4SLs) (replaced SGVs) and Suitable 4 Use Values (S4ULs) (replaced LQM/CIEH GACs). Where these values exist they should be used instead of the SGVs and LQM/CIEH GACs.

The CLR7 report 'Assessment of Risks to Human Health from Land Contamination: An Overview of the Development of Soil Guideline Values and Related Research' was withdrawn in 2008. Consultants when assessing site investigation data should adopt a suitable statistical approach. The CIEH and CL:AIRE set out in the document 'Guidance on Comparing Soil Contamination Data with a Critical Concentration' an approach that is a useful starting point for statistically assessing data.

It is usually inappropriate to apply quantitative criteria developed outside the UK, to UK sites, as assumptions underlying the models used to derive these criteria often reflect different behaviour patterns, local soil types or other technical factors.

Where other land contamination quantitative criteria are used e.g. Dutch or USEPA, the reasoning behind not using current UK guidance should be given and their use must be fully justified and referenced within the report. This would be expected to include a discussion of the conceptual model and assumptions used to derive the generic criteria together with an assessment of the underpinning toxicological data.

5.4 Assessment criteria for ground gas

If the development is situated within 250m of a landfill site or is suspected of having the potential to generate ground gas, it will be necessary to assess the potential risk and, if required, to incorporate appropriate gas protection measures into the development design.

When undertaking gas monitoring and designing gas protection measures reference should be made the following British Standards:

- BS8576 - Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds (VOCs)
- BS8485 - Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings

Guidance is also available for assessment of the risks associated with the presence of methane and carbon dioxide within ground gas (full references are given at the end of this document), this includes:

- CL:AIRE TB18 - Continuous Ground-Gas Monitoring and the Lines of Evidence Approach to Risk Assessment
- Assessing Risks Posed by Hazardous Gas Ground Gases to Buildings (CIRIA C665)
- BRE Report 414 publication Protective Measures for Housing on Gas Contaminated Land
- NHBC - Guidance on Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are present
- CIEH Local Authority Guide to Ground Gas

Due to the age of some of the guidance documents their use will need to be fully justified.

It should also be noted that when submitting ground gas monitoring data a current calibration certificate for all machines used for the gas monitoring should also be submitted. The risk assessment will also need to demonstrate that sufficient data have been obtained to determine the gas regime for the site.

6.0 Cover Systems

The main function of an engineered cover system should be to provide a safe and permanent barrier between any 'significant' levels of buried contamination and residents/site users.

It is not uncommon for developers to include a simple cover system into garden and soft landscaped areas. This is done in order to provide a reduction in the hazard to human health in situations where 'marginally' elevated levels of contaminants have been encountered, as well as to provide a suitable medium for plant growth.

There is currently no definitive guidance available that is able to adequately address the design of either of these cover systems. Therefore the CLS considers that where cover systems are used there should be no distinction between 'marginal' and 'significant' levels of contamination.

6.1 Depth of cover systems and capping layers

Where used as a capping layer of cover system, fill materials should be installed at prescribed depths according to their soil type and the role they play within the cover system. As cover systems are almost always site-specific, the various depth of fill can vary greatly depending on how complex or engineered the cover system is to be, but there are a few minimum standards to be observed, which are described below.

Typical cover system design requires a capillary break layer at its base, which is then overlain by various depths/types of fill material. These individual layers working in unison form the cover system or capping layer.

The minimum acceptable total depth for fill materials (including the break layer) within private garden areas should be 600 mm. This figure is recommended and has been adopted for the following reasons:

i. Root systems for shrubs are typically up to 600 mm;
ii. Excavations are unlikely to be deeper than 600 mm in typical gardening activities;
iii. Bioturbation (soil-mixing by biological organisms) is typically limited to the top 600 mm of the soil profile;
iv. Excavations by children or pets are unlikely to exceed 600 mm.

The minimum acceptable total depth for fill materials (including the break layer) within areas of soft-landscaping, common areas or public open spaces is 450 mm. This relaxation of cover depth is designed to reflect the reduced risk afforded by diminished exposure of human health receptors to potentially contaminated soils within these public areas via direct contact (dermal, ingestion, inhalation).

6.2 Depth of growing medium and planting

In certain circumstances, where it can be demonstrated that future activities will not result in soil mixing, it may be acceptable to use a shallower depth of cover material. A robust case would need to first be presented for prior approval from the LPA. An additional consideration when planting landscaped areas is that BS 3882 recommends the rooting depths in Table 2.

Table 1 Growth medium rooting depths for various vegetation types

Vegetation Type	Rooting Depth (mm)
Grass	450
Plants	450
Shrubs	600
Trees	900

6.3 Sampling Ratios

When a cover system is used, a desk study should be provided with details of the source of the cover material. It should be demonstrated that the soil is free from contamination by supplying results of analytical tests. Justification for the analytical suite used should be included. Sampling densities should be justified and based on the findings of a desk study. It would be expected that as an absolute minimum sampling would consist of at least three samples for each source used. One sample for every 200m^3 from proven 'greenfield' sources and one sample every 50m^3 from 'unknown', 'mixed' or 'brownfield' sources (for residential gardens). Table 3 summarises the recommended sampling frequencies depending on the soil source and end use.

Table 2 Sampling frequencies for imported or site-won fill materials

End-Use	Greenfield Soils	Remediated Soils	Brownfield Soils	Unknown Soil Source
Residential Gardens	1:200m^3	1:100m^3	1:50m^3	1:50m^3
Soft landscaping	1:200m^3	1:150m^3	1:150m^3	1:150m^3
Other	1:200m^3	1:200m^3	1:200m^3	1:200m^3

6.4 On-site or Off-site Soil Validation

Fill material imported onto site should be stored in a designated area, which is clearly identified on an appropriate scale plan. Stockpile management protocols consistent with best practice apply.

The Environmental Protection Team does not routinely accept off-site validation of fill material (whether this is top-soil, sub-soil or other substrate), as this often results in chemical testing of different material to that actually imported to site. It is therefore difficult to prove the exact chemical nature of the material eventually imported, as off-site validation tends to involve composite samples taken from a 'typical batch' of the material intended for import. As such, validation testing of imported fill materials should be carried out in-situ, after materials have been imported to site.

An exception will be made if samples can be taken at source from a stockpile which has already been allocated to the site in question and this can be proven in the validation report.

6.5 Documentary Evidence

Chemical analysis: All raw laboratory data should be submitted with the analytical test certificate.

Statistical analysis of datasets: Calculations in line with CIEH/CL:AIRE guidance should be provided.

Photographic evidence: Photographs of installed remedial measures (of any type) are required. Photographic evidence should be representative and where necessary, include a scale/ruler. This is of particular importance when photographing cover depths to verify the agreed depth of cover has been installed.

Plans: Showing pertinent information relating to remediation, such as stockpile locations, areas subject to remedial measures or areas of further investigation.

Import/export data: Pertinent data relating to fill materials/wastes, including volumetric data (i.e. how much was imported to site), source data (i.e. where the material came from) and waste transfer data (where applicable).

6.6 Obtaining Representative Samples

All sampling strategies should be designed to provide data that is representative of the site conditions as a whole. Sampling should be undertaken in accordance with recognised sample collection methodology and guidance, with reference made to recommendations within the British Standard BS10175 guidance document. It is essential to derive a CSM using the information obtained from the PRA to target possible sources of contamination and also to ensure that an appropriate suite of analysis is performed. Justification for the chosen sampling regime and analysis suite should be clearly set out in the site investigation report.

A suitably accredited laboratory should be used to undertake analysis of samples. The site investigation should include a detailed plan showing the location of sampling points and accreditation details of the laboratory used, together with summary tables of results. A full set of results, including exploratory hole logs, should be submitted.

7.0 Other Information

7.1 Human Remains and / or Burial Sites

If you have been made aware through means such as historical records that the site is on or adjacent to an existing or former burial ground that may contain human remains, you must contact Environmental Health at the earliest opportunity.

If at any time during site investigation works, ground-works or excavating on a site within the boundary of MCC you discover human remains, suspected human remains or bones of an unknown type you must stop all works, secure the area and contact the Police and Environmental Health for advice. Environmental Health can be contacted through the City Council's contact centre on 0161 234 5004.

7.2 Japanese Knotweed

Japanese knotweed is a very invasive species of plant which is not native to the British Isles. Since it was introduced into the UK as an ornamental garden plant in the mid-nineteenth century it has spread across the UK, particularly along watercourses, transport routes and waste areas. Japanese knotweed is not just a problem for our native wildlife; the vigorous growth can also damage buildings and hard surfaces. Once established underneath or around the built environment, it can be particularly hard to control.

Neither the Environment Agency or the Local Authority are responsible for controlling Japanese knotweed, other than that growing on their own land. Managing knotweed is the responsibility of the owner/occupier of a site.

Japanese Knotweed Guidance
Invasive Species Guidance

Contact Details for the Environment Agency

Telephone: 08708 506 506 (Mon-Fri, 8am - 6pm)

E-mail: enquiries@environment-agency.gov.uk

Postal Address: National Customer Contact Centre, PO Box 544 Rotherham S60 1BY

7.3 Asbestos

With regard to the MCC CLS there are three issues related to asbestos that we may be contacted in relation to and they are;

- Dealing with asbestos as part of a land contamination condition or in relation to the planning process;
- Concerned members of the public thinking about asbestos in their homes, in/on neighbouring properties or on current developments close by, and;
- Members of the public working and being exposed to asbestos in their workplace.

7.3.1 Asbestos and Contaminated Land

If the presence of asbestos within made ground is suspected then contact use via the City Council's contact centre on 0161 234 5004.

7.3.2 Asbestos, Neighbours and Current Developments

If the issue is with members of the public having concerns with their house, neighbours or building sites dealing with asbestos sheeting or similar, then please visit our website.

If asbestos is suspect within a building due for demolition then the initial contact should be with the Health and Safety Executive.

7.3.3 Asbestos at Work

If the issue is work related then please visit the Health and Safety Executive website.

7.4 Coal Mining

Historical coal mining has been undertaken in part of MCC.

If the Coal Authority (CA) does not comment on specific risks (which they will only do when there have been recorded emissions) on occasion this is wrongly being interpreted as implying that there are no gas risks. Due to the volume of consultation responses they deal with they do not have the in-house capacity to provide detailed technical guidance in every case. The CA have provided a statement where former mining has been identified on a site which has been included in Appendix C.

8.0 References

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Department of the Environment, 2004, PPS23, Planning & Pollution Control.

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8.1 Additional Reference Material

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Department of the Environment, 1994, CLR Report No 4, Sampling Strategies for Contaminated Land.

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Department of Environment, Transport and Regions, 2000, Guidelines for Environmental Risk Assessment & Management, Revised Departmental Guidance.

Environment Agency, 1999, R&D Publication 20, Methodology for the Derivation of Remedial Targets for Soil and Groundwater to Protect Water Resources.

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Environment Agency, February 2010, SC030114, Evidence, Verification of Remediation of Land Contamination.

Harris, M R, Herbert, S M & Smith, M A, 1995-1998, CIRIA Special Publications 101-112, Remedial Treatment for Contaminated Land, 12 Volumes.

Health & Safety Executive, 1991, Protection of Workers & the General Public during the Development of Contaminated Land.

National House Building Council (NHBC), 1999, NHBC Standards Chapter 4.1, Land Quality – Managing Ground Conditions.

The LQM/CIEH S4ULs for Human Health Risk Assessment, 2015.

Appendix A Checklist outlining the information required in support of a planning application

Preliminary Risk Assessment/Desk Study (pre-commencement)

- A site description.
- A detailed site plan showing the site location, extent and boundary.
- A review of historical information including copies of historical maps where available.
- Background information on past and present uses of the site and its surrounding area.
- Background information on the nature of any hazards and potential sources identified.
- An appraisal of the site's environmental setting including:
- Geology, hydrology and hydrogeology.
- Information on coal workings and other extractive industries.
- Waste management issues and landfill sites.
- Water abstractions and discharges, pollution incidents, IPPC Part A and B, and radon.
- Drainage and services.
- A review of previous desk studies or site investigations.
- Risk screening by means of an initial conceptual model, which should generally include the following.
- Source characterisation.
- Migration pathway descriptions.
- Environmental receptor identification and discussion.
- Identification of potential pollution linkages.
- Description of the limitations and uncertainties inherent in the conceptual model.
- Recommendations and conclusions.

Phase 2 Site Investigation (pre-commencement)

- Site Investigation Methodology:
    - A clear investigation scheme, based on findings of desk study.
    - Methods of investigation with justification of the methodology and investigation techniques used.
    - Justification of exploration locations and a plan showing their position.
    - Sampling and analytical strategy.
    - Coverage of investigations (statistical significance - targeted and non-targeted)
- Environmental monitoring including water sampling and gas monitoring/sampling.
    - Results and findings of the site investigation:
    - Ground, groundwater and gas conditions encountered.
    - Presentation of laboratory analysis, sampling and monitoring results.
- Discussion of any ground contamination (soil/gas/water) encountered.
- Refine conceptual model.
- Qualitative and quantitative risk assessments (clearly identifying pollutant linkages).

- Recommendations for remediation.
- Recommendations for further investigation (if required).

Remediation Strategy (pre-commencement

- Clear remediation strategy.
- Detailed outline of works to be carried out.
    - Description of ground conditions.
    - Type, form and scale of contamination to be remediated.
- Consents, agreements and licenses (waste management issues).
- Implementation and validation of remediation.
    - Use of on-site observations and visual evidence.
    - Chemical analysis/monitoring data.
    - Proposed clean up standard.
    - Construction Quality Assurance.

Verification Report (post completion)

- Details of works carried out and contamination encountered during investigation.
- Details and justification of any changes from the original remediation strategy.
- Demonstration of compliance and description of validation methods.
    - Laboratory and in-situ results.
    - Monitoring results for groundwater and gases.
    - Summary data plots and tables relating to clean up criteria.
    - Plans showing treatment areas and details of any differences from the original remediation strategy.
    - Photographic and other media records.
    - Waste management details and records.
- Ongoing environmental monitoring or works to be carried out.
- Confirmation that remediation objectives have been met.

Appendix B Frequently Asked Questions

Q: How much of the work can I do without employing a consultant?

A: Simply determining whether land contamination is likely to be an issue is relatively straight-forward. Researching the history and uses of a site at the local studies unit of a library, and making enquiries of the Council and other agencies, can be carried out by competent developers. You can also contact the Environmental Protection Team and request an Environmental Search to use as part of the Desk Study, for further information and costs see our website

Q: Can the Council advise on employing a consultant or contractor?

A: The Council cannot recommend any consultant or contractor. Lists can be found in telephone and trade directories. There are websites that may help to identify consultants and contractors with suitable experience. Advice may be given as to the type of expertise a consultant or contractor might be expected to demonstrate.

Q: Who should I address correspondence to within the Council?

A: Once a land contamination condition has been placed on an application all correspondence relating to the subsequent assessment process should be directed to the Planning Department who will refer the information to the Environmental Protection Team. The team will keep the appropriate planning officer informed of the progress of the application.

Q: When should I contact the Environment Agency?

A: Although local authorities are the primary regulators of Part 2A, the Environment Agency assume the role when contamination is found to impact on controlled waters. Therefore, if a development is likely to impact on either surface waters or groundwater the advice of the Agency should be sought.

Appendix C Coal Authority Statement

The CA does not have any interest in matters of ground contamination, but does seek to ensure that where development is proposed on sites with coal mining features at or near the surface, the risks of potential ground instability and the possible presence of mine gas are appropriately considered and reflected in the layout and design of the development as may be necessary, and in any proposed mitigation or remediation measures.

The CA identifies specific risk features based on abandoned mine plans and other data, and in combination they constitute the CA defined Development High Risk Area (DHRA). The CA normally contacts all 181 local planning authorities within the defined coalfield every April to advise of the availability of the current DHRA data, and to request that it is downloaded by each LPA. Guidance on the consideration of coal mining related risks and our consultation process is also produced and periodically reviewed by the CA and is made available to all such LPAs.

For most forms of development within the DHRA, LPAs should require developers to submit a Coal Mining Risk Assessment (CMRA) with the Planning Application. For more guidance please go the Coal Authority website.

If a CMRA is required, the LPA should then also consult the Planning team at the CA in accordance with the formal consultation process. The Planning team will review the submitted CMRA and compare it with the mining information held by the CA. In accordance with the CA defined role as a statutory consultee, a substantive response will then be sent back to the LPA. The response will confirm whether or not the submitted CMRA is considered adequate, and whether or not the CA wishes to raise any objection to the proposed development. If an objection is not raised then it is usually the case that the CA will recommend certain pre-commencement planning conditions in respect of site investigation and remediation as may be necessary.

Some specific risk features (such as mine entries and their zones of influence) are considered to have direct implications for site layout, whereas others (such as probable and recorded coal mine workings at shallow depth) do not have a direct impact on site layout provided appropriate investigation is undertaken, and appropriate remediation is implemented. It is important to note therefore that within the DHRA, LPAs should ensure that CMRA are treated as a fundamental validation requirement. They should not be required by planning condition, as the matters in consideration may be critical to the very principle of the development.

A CMRA should be produced by a technically competent person and should review a breadth of source data to consider the potential risks of ground instability and mine gas. In addition to identifying such risks, the risk assessment should show how all coal mining related risks that cannot be discounted, have been appropriately reflected in the development that is proposed and in any further site investigations and related remedial or mitigation measures that may be recommended.

The CA expects that where possible stability risks should be dealt with directly. Engineering solutions related to the design of the development will not normally be considered acceptable as a substitute for ground treatment, unless such treatment is

demonstrated to be impractical, and the proposed engineering solution has been designed on the basis of specific site investigations.

It should be noted that wherever coal resources or coal mine features exist at or near the surface, there is the potential for mine gases to exist. These risks should always be considered by the LPA.

Potential gas pathways to the surface can change over time and may be induced by construction activities on site.

There are different types of mine gas - all potentially toxic, and some potentially explosive.

Whilst it is expected that the risks of mine gas are taken into account in CMRA, in its responses to LPAs the CA will normally only highlight specific gas risks and make related recommendations where we have records of previous gas emissions in the locality.

If we do not raise a specific comment, it should be recognised by LPAs and developers that mine gas may nonetheless be present. Therefore, no comment should not be interpreted as meaning no risk.

Whether or not specific risks are highlighted by the CA, LPAs should seek their own technical advice on the gas risks that may exist, and appropriate measures to be implemented, from technically competent personnel.

Please note that whilst our statutory role only involves discussion with LPAs through the formal consultation process, developers and their technical advisors may seek guidance from the CA through our chargeable Pre-application Advice Service.

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- Report Errors and Omissions to the Architect.
- Check all dimensions on site
- Drawing to be read in conjunction with the Health and Safety Plan and all relevant Risk Assessments

1:5
1:50 1m 2 3

1:1
1:100 1m 2 3 4 5 6

Schedule of Accommodation

House Type	Area	Count	
1b2p	49 m²	1	
1b2p	50 m²	4	
1b2p	51 m²	30	
1b2p	52 m²	22	70%
		57	
2b3p	61 m²	13	
2b3p	62 m²	1	
2b3p	63 m²	7	
2b3p	66 m²	4	30%
		25	
		82	

6 No. Accessible = 7% Total Car Parking

N

Proposed Site Plan
1 : 200

1:1
1:200 2m 4 6 8 10 12 14 16 18 20 22 24 26 28 30

P:\2022\22-049\Drawings\working\arefix - site.rvt

Rev. Date Drn. Chkd.

BowkerSadler

Project
Grey Mare Lane

Client
Great Places Housing Group

Drawing
Proposed Site Plan

Scale	Sheet Size	Drawn	Checked	Date
1 : 200	@ A1	AT	KLM	28/03/2025

Project No.	Originator	Zone	Level	Form	Discipline	Number	Revision
22-049 -	BSA -				A -	**2005**	

Status
Tender

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