

Solum House
Unit 1, Elliott Court
St Johns Road
Meadowfield
Durham
DH7 8PN
Tel: (0191) 378 6380

e-mail: admin@arc-environmental.com
www.arc-environmental.com



PHASE 2: GROUND INVESTIGATION REPORT

JLL PLANNING / ADEPT CONSULTING ENGINEERS

PROPOSED EXTENSION

MILLBROOK INDEPENDENT HOSPITAL

WASTDALE ROAD

MANCHESTER

M23 2RX

Project No: 24-586

Prepared by:

Thomas White

Date:

A blue ink signature of Thomas White.

25/04/2025

Approved by:

Phillip Brown

Date:

A blue ink signature of Phillip Brown.

25/04/2025

The information and / or advice contained in this Phase 2: Ground Investigation Report is based solely on, and is limited to, the boundaries of the site, the immediate area around the site, and the historical use(s) unless otherwise stated. This 'Report' has been prepared to collate information relating to the physical, environmental, and industrial setting of the site, and to highlight, where possible, the likely problems that might be encountered when considering the future development of this site for the proposed end use. All comments, opinions, diagrams, cross sections and / or sketches contained within the report, and / or any configuration of the findings is conjectural and given for guidance only and confirmation of the anticipated ground conditions should be considered before development proceeds. Agreement for the use or copying of this report by any Third Party must be obtained in writing from Arc Environmental Limited (ARC). If a change in the proposed land use is envisaged, then a reassessment of the site should be carried out.

CONTENTS

1.0 INTRODUCTION	Page 3
2.0 SITE DETAILS	Page 3
3.0 SCOPE OF WORKS	Page 3
4.0 INVESTIGATION RATIONALE	Page 3
4.1 – Contamination Related Sampling & Site Protocols	Page 4
5.0 GROUND CONDITIONS	Page 4
5.1 – Soil Profile	Page 5
5.2 – Groundwater & Stability	Page 5
5.3 – Existing Foundations	Page 5
6.0 INSITU TESTING & SAMPLING	Page 6
6.1 – Insitu Standard Penetration Tests	Page 6
6.2 – Gas and Groundwater Monitoring	Page 6
7.0 LABORATORY TESTING	Page 8
7.1 – Determination of pH & SO ₄	Page 8
7.2 – Determination of Liquid & Plastic Limits	Page 8
7.3 – Contamination Screening / Screening Strategy	Page 9
8.0 GROUND CONTAMINATION RISK ASSESSMENT	Page 9
8.1 – Methodology	Page 9
8.2 – Level 1 Risk Assessment (Human Health)	Page 9
8.3 – Controlled Waters Risk Assessment	Page 11
8.4 – Revised Conceptual site Model (RCSM)	Page 11
9.0 CONCLUSIONS & RECOMMENDATIONS	Page 13
9.1 – Ground Conditions	Page 13
9.2 – Groundwater & Stability	Page 14
9.3 – Waste Classification Analysis	Page 14
9.4 – Foundation Options	Page 15
9.5 – Ground Contamination Assessment	Page 15
9.6 – Gas Protection Measures	Page 15
9.7 – General Comments	Page 16

APPENDICES

Appendix I	Location Plan, Aerial Photograph, Existing Site Layout Plan & Proposed Development Layout Plan
Appendix II	Exploratory Hole Location Plan & Borehole Record Sheets & Foundation Detail Record Sheets
Appendix III	Laboratory Results (Geotechnical & Ground Contamination) & Gas Monitoring Sheets
Appendix IV	Waste Classification Report

1.0 Introduction

April 2025

As requested by JLL Planning / Adept Consulting Engineers, and following the results of the Phase 1 Desk Top Study (Arc Environmental Ltd – August 2024), Phase 2: Ground Investigation works have been carried out at the site at Millbrook Independent Hospital, Wastdale Road, Manchester, M23 2RX where proposals have been made to develop an extension to the existing hospital building.

The intrusive investigation works undertaken comprised 5 no. windowless sampling boreholes (WS01 to WS05) and 2 no. manually excavated foundation trial pits (TP01 and TP02). The positions of the investigation locations can be seen on the Exploratory Hole Location Plan, a copy of which is attached in Appendix II. It should be noted that this plan is for orientating purposes only, as the positions shown are approximate and the plan is not to a standard scale.

2.0 Site Details

Table 2.1

Site Name & Address:	Millbrook Independent Hospital, Wastdale Road, Manchester, M23 2RX.
National Grid Reference:	381020, 387770 (representative for the central part of the site).
Description of Location:	The site is located c.11km south of Manchester centre c.0.3km to the southeast of Wythenshawe Hospital just off Wastdale Road. The majority of the site is occupied by a single-storey hospital in the centre of the site, with a greenhouse and vegetable beds in the southern site area, and an asphalt car park in the eastern site area. The site boundaries are formed by hedges and fences.

3.0 Scope of Works

Table 3.1

Client:	JLL Planning
Consultants:	Adept Consulting Engineers
Project type:	Proposed hospital extension.
Site Location plan:	See Appendix I.
Layout plan (existing):	See Appendix I.
Layout plan (proposed):	See Appendix I.
Investigation Works:	5 no. windowless sampling boreholes and 2 no. manually excavated foundation pits
Laboratory Testing:	Geotechnical and Ground Contamination.
CLEA End-Use Classification:	Level 1 GQRA – Hospital (Residential with home produce GQRA adopted).
Summary of Historical Site Information:	The earliest mapping of the site (c.1877) recorded the site as undeveloped agricultural land with a footpath traversing the site east to west. The site remains unchanged until c.1960 when residential buildings are recorded in the north, west and southern portions of the site with the centre and eastern portion of the site remaining undeveloped. By c.2000 the buildings on site are demolished with the site redeveloped with the current building by c.2006 with no changes to the site up present day (c.2024).

4.0 Investigation Rationale

The information contained in this report is limited to the areas of the site, as indicated on the Existing and Proposed Site Layout Plans shown in Appendix I, and to those areas accessible during the ground investigation. The depths of strata on the record sheets are recorded in m below current ground levels. When considering the full scope of the development any features and / or issues not specifically mentioned in this report cannot be assumed to have been covered. This ground investigation has been designed to provide information on the general ground and groundwater conditions where access would allow, within the boundaries of the site.

4.0 Investigation Rationale (Cont'd)

The rationale behind the location of each exploratory hole is summarised in Table 4.1 below.

Table 4.1

<u>Potential issue</u>	<u>Exploratory hole</u>
Determine the nature of the underlying ground conditions, including shallow groundwater.	WS01 to WS05 and TP01 to TP02
Determine the levels of contamination present within the initial deposits with a view to determining the risks posed towards the future site end-users.	WS01 to WS05
Determine the depth, condition, and founding strata of the existing building where the new extension is proposed to be constructed.	TP01 to TP02
Undertake gas monitoring to determine the risk to the proposed development from the potential production / migration of hazardous ground gas.	WS01, WS03 and WS05

4.1 Contamination Related Sampling & Site Protocols: -

All works associated with this ground contamination assessment and investigations have generally been completed in accordance with BS10175:2011+A2:2017: Investigation of potentially contaminated sites – Code of practice & Land Contamination Risk Management (LCRM: October 2020) with the following precautions specific to this project.

4.1.1 Ground Contamination Sampling: -

Samples were recovered by a representative of ARC Environmental Ltd. during the intrusive investigation works. All samples were stored at approximately c.2-8°C using cool boxes and ice packs prior to delivery to a UKAS / MCERTS accredited laboratory. Sampling was carried out in accordance with 'Technical Policy Statement 63: UKAS Policy on Deviating Samples'.

4.1.2 Onsite Health & Safety Requirements: -

All site representatives wore relevant and appropriate PPE including (where appropriate) safety footwear, high visibility jacket / vest, hard hat, eye protection and overalls. In addition, disposable latex gloves were used when handling any potentially contaminated materials and when rinsing all sampling tools. Each site vehicle contained a suitable First Aid kit with hand wash station / cleansing products (i.e., sanitary wipes).

4.1.3 Avoiding Cross-Contamination between Sample Locations: -

To avoid cross-contamination of materials between soil horizons, drill casing was used to seal off the made ground. The samples were recovered manually using dedicated disposable plastic gloves, replaced between each sample recovery.

5.0 Ground Conditions

For an accurate description of the ground conditions encountered at each investigation position, reference should be made to the Foundation Detail Record Sheets and Borehole Record Sheets attached in Appendix II. It should be noted that there is always the possibility of variation in the ground conditions around and between the exploratory hole locations.

5.0 Ground Conditions (Cont'd)

5.1 Soil Profile: -

Made ground was identified in all windowless sampling boreholes and trial pit locations and ranged in thickness from ground level to depths of between c.0.50m and c.1.20m below current ground levels (bcgl) generally comprising sandy gravel, sandy gravelly soil and sandy gravelly clay with fragments of brick, ash, sandstone, limestone and quartzite. No visual or olfactory evidence of significant contamination (i.e. fuels, oils or asbestos containing materials) was encountered during the intrusive investigation.

Natural superficial deposits were encountered in two of the windowless sampling boreholes (WS02 and WS03) and both trial pit locations, and comprised reddish brown sandy gravelly clay and reddish brown sand respectively. The deposits were identified to depths of between c.1.40m and c.1.60m bcgl within the windowless sampling boreholes, and to at least c.1.35m within the trial pits.

Solid geology was encountered within all of the windowless sampling boreholes from depths of between c.1.00m and c.1.60m bcgl, and generally comprised light grey highly weathered mudstone. All of the windowless sampling boreholes were terminated within the mudstone bedrock at depths of between c.2.87m and c.3.34m bcgl upon refusal of the sampling equipment.

5.2 Groundwater & Stability: -

During the intrusive investigation, water strikes were not encountered in the boreholes, with the exception of WS04 where slight water ingress was noted at c.0.15m bcgl. In addition, groundwater levels between c.1.09m and c.1.45m bcgl have been recorded within the monitoring wells in boreholes WS01 and WS03 during the first two rounds of monitoring. The water ingress and standing water levels within the monitoring wells are attributed to trapped / perched groundwater.

Consequently, shallow water ingresses are likely to occur within shallow construction related excavations and therefore provision should be made for the introduction of suitable groundwater control measures, in order to take care of any ingresses of groundwater which may occur, especially during the wetter periods of the year.

The trial pits and windowless sampling boreholes remained stable throughout the intrusive investigation works. However, suitable trench support should be implemented in any foundation excavations / service trenches to be dug during the development works.

5.3 Existing Foundations: -

To assist with the addition of to the proposed extension, a series of manually excavated trial pits were dug along the southern elevation of the existing building to uncover the form and condition of the existing foundations. The findings of each trial pit are described in table 5.1 below.

Table 5.1

<u>Trial Pit Location</u>	<u>Description & General Comments</u>
TP01	The existing brick wall extended to a depth of c.0.75m bcgl sitting on a concrete footing with a projection from the brick wall of c.0.55m. The foundation extended to at least c1.35m bcgl (at least c.0.60m thick)
TP02	The existing brick wall extended to a depth of c.0.80m bcgl sitting on a concrete footing with a projection from the brick wall of c.0.37m. The foundation extended to at least c1.35m bcgl (at least c.0.55m thick)

Based on the findings of the manually excavated trial pits, it is anticipated that the foundations identified will extend down onto the mudstone bedrock identified from depths of between c.1.10m and c.1.60m bcgl within the adjacent windowless sampling boreholes.

6.0 Insitu Testing

6.1 Insitu Standard Penetration Tests: -

Standard penetration tests (SPT's) were carried out within the windowless sampling boreholes with the use of a normal split spoon sampler within the boreholes to determine the relative density / strength of the materials tested. The results are shown as uncorrected 'N' values on the borehole record sheets, adjacent to the appropriate sample level. A summary of the results of the tests undertaken can be seen in Table 6.1 below.

Where the full penetration depth, including seating blows (450mm), could not be achieved, the bottom sampling depth is indicated as less than 0.45m from the top (start of test), with the actual depth of penetration and number of blows undertaken also being recorded.

Table 6.1

* after Clayton (1995) considering N_{60} values

Type of Strata	Range of SPT 'N' Values	Result details
Mudstone bedrock	6 to 35 and 59 to 71 blows for limited penetration	Indicative of extremely weak to weak rock*

6.2 Insitu Gas & Water Monitoring: -

When considering the findings of the Phase 1: Desk Top Study Report, potential sources of ground gas were recorded on site and within a plausible distance of the site. Therefore, ground gas and water monitoring standpipes were installed within the boreholes (WS01, WS03 & WS05), primarily to check for the possible presence of hazardous ground gases, and to monitor any shallow water levels.

A standard 50mm diameter HDPE standpipe, with gravel and geo-wrap surround, bentonite seal, gas valve cap and security cover, was installed within each borehole to depths of c.2.00m, and ground gas and water levels were allowed to reach equilibrium, prior to the first monitoring visit.

Monitoring was undertaken using a Gas Data GFM series soil gas analyser, with integral flow meter, and a Geotechnical Instruments electronic dip meter. The response zones were designed to target any ground gas from both on and off-site sources. Based on the findings of the intrusive investigation works, in accordance with CIRIA Report C665, November 2007, Report Edition No. 04, March 2007 and BS8485:2015+A1 2019 – Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings, it is felt that an adequate risk assessment can be undertaken based on the following limiting factors:

- The development has been considered as low sensitivity i.e., commercial (Tables 5.5a & 5.5b – Typical / Idealised frequency and period of monitoring, after Wilson et al, 2005).
- The risk associated with the generation potential of a source is considered as very low (assessment based on the findings of intrusive investigation works).
- Monitoring over a minimum of two months with four recorded readings (Tables 5.5a & 5.5b – Typical / idealised frequency and period of monitoring after Wilson et al, 2005).
- Negligible flow rates are recorded during the monitoring period (Table 8.5 – Modified Wilson & Card classification).
- A targeted and phased programme of gas monitoring will be completed, which will obtain gas monitoring readings during varying atmospheric conditions, which covers the 'worst case' scenario for ground gas emissions to occur, particularly during rapid falls in atmospheric pressure (i.e. from c.1020mb and c.1010mb), and during low atmospheric pressure events (i.e. c.1000mb and below).

6.0 Insitu Testing (Cont'd)

6.2 Insitu Gas & Water Monitoring (Cont'd): -

Monitoring of the weather conditions and predicated atmospheric pressures (Met Office Surface Pressure Charts) are carried out up to 72 hours in advance of proposed monitoring visits, in order that a reasonable period of data is obtained to determine atmospheric trends, and to target the 'worst case' scenario. The monitoring visits completed correlate with falling and steady atmospheric pressure trends and represent worst case conditions including falling atmospheric pressure trends, and atmospheric pressures below 1000mb.

A summary of the results for the visits undertaken to date, compared with the 'inert' background gas levels is presented in Table 6.2 below, with the certificate attached in Appendix III.

Table 6.2

Table 6.2

<u>Position</u>	<u>Date</u>	<u>Atmospheric Pressure (mbar)</u>	<u>Water (m bgl)</u>	<u>CH₄ (%v/v)</u>	<u>LEL (%v/v)</u>	<u>CO₂ (%v/v)</u>	<u>O₂ (%v/v)</u>	<u>Flow Rate (l/hr)</u>
Background		~	~	0	0	0	21.0	<0.1
WS01	20/03/25	1014-1015 (falling*)	1.11	0.0	0.0	0.6	20.1	<0.1
WS03			1.33	0.0	0.0	1.3	19.9	<0.1
WS05			Dry	0.0	0.0	2.1	18.3	<0.1
WS01	01/04/25	1022 (falling*)	1.09	0.0	0.0	0.5	20.0	<0.1
WS03			1.45	0.0	0.0	0.8	20.0	<0.1
WS05			Dry	0.0	0.0	2.3	18.3	<0.1
2 outstanding visits to be completed								

*Taken from [Past Weather in Manchester, England, United Kingdom — Yesterday or Further Back](#)

As can be seen from the results undertaken to date, detectable levels of Carbon Dioxide (CO₂) have been recorded (up to 2.3%), with slightly depleted Oxygen (O₂) concentrations (minimum 18.3% v/v). Negligible flow rates of <0.11/hr have been recorded. No detectable levels of Methane (CH₄) have been recorded.

Based on the results of the monitoring undertaken, in accordance with CIRIA Report C665, a risk assessment has been completed for this site, by converting the results in Table 6.2 above to a Gas Screening Value (GSV), calculated by multiplying the typical maximum gas concentrations with the recorded maximum positive flow rates (after Wilson & Card). The GSV for CH₄ and CO₂ have been calculated, using the maximum recorded values, with a maximum flow rate of <0.11/hr. The GSV can be calculated as follows:

$$\begin{aligned} \text{Methane GSV} &= \text{N/A} \\ \text{Carbon Dioxide GSV} &= 0.023 (2.3\%) \times 0.1 = 0.023 \text{ l/hr} \end{aligned}$$

When considering these results in accordance with CIRIA C665, the site should be classified as Characteristic Situation 1 (CS1). A further two monitoring visits have been scheduled for this site and the results along with the final recommendations will be issued as an Addendum Letter Report.

When considering the potential risks associated with Radon gas, the Envirocheck Report obtained as part of the Phase I Desk Study confirms that the site is within an area where less than 1% of homes are at or above the action level for radon, and confirms that radon protection measures are not required to be installed at the site.

When considering the results of the groundwater monitoring, groundwater levels of between c.1.09m and 1.45m bgl were observed. As such, it would be prudent to allow for the introduction of groundwater control measures (i.e., sump pumping equipment), to take care of any localised ingresses of groundwater which may occur during the construction period, especially during the wetter periods of the year.

7.0 Laboratory Testing

7.1 Determination of pH, SO₄, Mg, Cl & NO₃: -

Representative samples of the made ground and natural deposits recovered from the boreholes and trial pits during the investigation, were tested to determine their acidic (pH) and soluble sulphate (SO₄) levels. The results are shown in Table 7.1 below, and are also contained within the Chemtest Analytical Report (Ref. 25-08226) a copy of which can be seen in Appendix III.

Table 7.1

Position	Depth (m)	Strata	pH	SO ₄ (mg/l)	Mg(mg/l)	Cl(mg/l)	NO ₃ (mg/l)	Design SO ₄ Class	ACEC Class
WS01	0.40	MG	7.8	<10	~	~	~	DS-1	AC-1
WS01	0.90	MG	7.8	<10	~	~	~	DS-1	AC-1
WS01	1.20-1.60	NS	7.9	<10	~	~	~	DS-1	AC-1
WS02	1.00	NS	8.4	<10	~	~	~	DS-1	AC-1
WS02	1.60-2.00	NS	8.9	<10	<10	31	<10	DS-1	AC-1
WS03	0.40	MG	7.9	<10	~	~	~	DS-1	AC-1
WS03	1.60-2.00	NS	8.1	1100	66	<10	<10	DS-2	AC-2
WS04	0.30	MG	7.5	<10	~	~	~	DS-1	AC-1

ACEC = Aggressive Chemical Environment for Concrete site classification, MG = Made Ground, NS = Natural Strata

From these results the pH values for the samples of made ground materials and natural strata tested range from 7.5 to 8.9 and the amount of soluble sulphate (SO₄) present ranges from <10mg/l to 1100mg/l. In addition, soluble concentrations of magnesium, chloride, nitrate were below 100mg/l.

The mean soluble sulphate concentrations for the two highest values is 555mg/l. Therefore, in accordance with the BRE Special Digest 1:2005, the site should be given a classification of DS-2. When considering the nature of the made ground materials and natural strata tested and assuming mobile groundwater the assessment of the Chemical Environment for concrete is AC-2.

7.2 Determination of Liquid and Plastic Limits: -

Representative samples of the natural clay deposits and weathered mudstone recorded across the proposed development areas were tested to determine their liquid and plastic limits, so these materials could be classified. The results can be seen in Table 7.2 below and within the PSL Analytical Report (Ref. PSL25/2003), a copy of which is contained in Appendix III.

Table 7.2

M/C = Moisture Content, LL = Liquid Limit, PL = Plastic Limit, PI = Plasticity Index

Position	Depth(m)	M/C (%)	LL	PL	PI	Class	% Passing 425µm Sieve
WS01	1.20-1.80	17.0	36	18	18	CIM	95
WS02	1.00	18.7	28	17	11	CIL	95
WS04	1.50-2.00	17.7	34	15	19	CIL	98
WS05	0.80	15.6	33	18	15	CIL	97

From these results the samples tested, when plotted on the plasticity chart, the samples fall within the low and medium plasticity ranges, and from the resulting plasticity indices, have a low volume change potential, when considering the amount passing the 425µm sieve.

An increase in the minimum foundation depths of may be required if foundations are within proximity to existing or proposed trees. Reference should be made to BS5837: 2012, 'Trees in relation to design, demolition & construction', along with the NHBC Standards, Chapter 4.2 'Building near trees'.

7.0 Laboratory Testing

7.3 Contamination Screening / Screening Strategy: -

Representative samples of the made ground materials were passed onto Eurofins Chemtest Ltd of Newmarket so that soil contamination screening could be carried out to assess any potential risk to Human Health, and Controlled Waters, and to assist with off-site disposal.

The samples were screened using a standard generic contamination suite as detailed below (based on the CLEA SGV listed analytes with additions), which is used to assess typical made ground (disturbed natural strata mixed with anthropogenic debris) of an unknown source. The representative samples were also tested for Speciated PAH (Polycyclic Aromatic Hydrocarbons), Speciated TPH (Total Petroleum Hydrocarbons) & Asbestos. The catalogue of testing results can be found in the Chemtest Analytical Report (Ref. 24-42117-2), attached in Appendix III, and the total analysis carried out is summarised below.

4 no. soil samples screened for:

- A generic (metals and non-organics) soil suite including Arsenic, Cadmium, Chromium (III & VI), Copper, Lead, Mercury, Nickel, Selenium, Zinc, Cyanide and Total Organic Carbon (TOC)
- Speciated Polycyclic Aromatic Hydrocarbons (PAH's)
- Speciated Total Petroleum Hydrocarbons (based on a full Aliphatic / Aromatic Split & BTEX)
- Presence of asbestos.

8.0 Ground Contamination Risk Assessment

8.1 Methodology: -

Following completion of the contamination screening undertaken on various samples from this site, Level 1 quantitative ground contamination risk assessments have been undertaken, generally in accordance with BS10175: British Standard Code of Practice for the Investigation of Potentially Contaminated Sites (2011+A2:2017) & Land Contamination Risk Management (LCRM: October 2020).

This quantitative ground contamination risk assessment uses the current UK practice for assessing the risks from land contamination, which is based on the established *source-pathway-receptor* pollutant linkage methodology and 'suitable for use' approach (Part IIA, EPA 1990 - inserted through Section 57 EA 1995).

8.2 Level 1 Risk Assessment (Human Health): -

The soil screening results from across the site have been assessed by comparing the Maximum Concentration values (C_M) recorded for each analyte to the Critical Concentration (C_C) values chosen for this site (taken as *Residential with home grown produce* – 1% SOM) based on the presence of planters and home grown produce within the existing soft landscaped garden. The results of the testing are contained in Appendix III and are summarised in Table 8.1 on the following page.

8.0 Ground Contamination Risk Assessment (Cont'd)

8.2 Level 1 Risk Assessment (Human Health) (Cont'd): -

Table 8.1

Bold = Elevated concentrations

Analyte	Critical Conc. (C _C)	No. of Samples Screened	Max. Conc. (C _M) Recorded	No. of Samples > C _C
Arsenic	37 ⁽¹⁾	4	19	0
Cadmium	11 ⁽¹⁾	4	0.49	0
Chromium III	910 ⁽¹⁾	4	28	0
Chromium VI	6 ⁽¹⁾	4	<0.50	0
Copper	2400 ⁽¹⁾	4	59	0
Lead	200 ⁽²⁾	4	110	0
Mercury	40 ⁽¹⁾	4	0.39	0
Nickel	130 ⁽¹⁾	4	27	0
Selenium	250 ⁽¹⁾	4	0.81	0
Zinc	3700 ⁽¹⁾	4	120	0
Cyanide	34 ⁽³⁾	4	<0.50	0
Acenaphthene	210 ⁽¹⁾	4	<0.10	0
Acenaphthylene	170 ⁽¹⁾	4	<0.10	0
Anthracene	2400 ⁽¹⁾	4	0.26	0
Benzo(a)anthracene	7.2 ⁽¹⁾	4	0.61	0
Benzo(a)pyrene	2.2 ⁽¹⁾	4	<0.10	0
Benzo(b)fluoranthene	2.6 ⁽¹⁾	4	<0.10	0
Benzo(ghi)perylene	320 ⁽¹⁾	4	<0.10	0
Benzo(k)fluoranthene	77 ⁽¹⁾	4	<0.10	0
Chrysene	15 ⁽¹⁾	4	0.60	0
Dibenz(ah)anthracene	0.24 ⁽¹⁾	4	<0.10	0
Fluoranthene	280 ⁽¹⁾	4	1.40	0
Fluorene	170 ⁽¹⁾	4	<0.10	0
Indeno(123cd)pyrene	27 ⁽¹⁾	4	<0.10	0
Naphthalene	2.3 ⁽¹⁾	4	<0.10	0
Phenanthrene	95 ⁽¹⁾	4	1.10	0
Pyrene	620 ⁽¹⁾	4	1.30	0
VPH Aliphatic (>C5-C6)	42 ⁽¹⁾	4	<0.05	0
VPH Aliphatic (>C6-C8)	100 ⁽¹⁾	4	<0.10	0
VPH Aliphatic (>C8-C10)	27 ⁽¹⁾	4	<0.05	0
EPH Aliphatic (>C10-C12)	130 ⁽¹⁾	4	<2.00	0
EPH Aliphatic (>C12-C16)	1100 ⁽¹⁾	4	<1.00	0
EPH Aliphatic (>C16-21)	65000 ⁽¹⁾	4	2.30	0
EPH Aliphatic (>C21-C35)	65000 ⁽¹⁾	4	15.00	0
EPH Aliphatic (>C35-C44)	65000 ⁽¹⁾	4	<23.00	0
VPH Aromatic (>EC6-EC7)	70 ⁽¹⁾	4	<0.05	0
VPH Aromatic (>EC7-EC8)	130 ⁽¹⁾	4	<0.05	0
VPH Aromatic (>EC8-EC10)	34 ⁽¹⁾	4	<0.05	0
EPH Aromatic (>EC10-EC12)	74 ⁽¹⁾	4	<1.00	0
EPH Aromatic (>EC12-EC16)	140 ⁽¹⁾	4	<1.00	0
EPH Aromatic (>EC16-EC21)	260 ⁽¹⁾	4	10.00	0
EPH Aromatic (>EC21-EC35)	1100 ⁽¹⁾	4	29.00	0
EPH Aromatic (>EC35-EC44)	1100 ⁽¹⁾	4	<16.60	0
Benzene	0.087 ⁽¹⁾	4	<0.0010	0
Toluene	130 ⁽¹⁾	4	<0.0010	0
Ethylbenzene	47 ⁽¹⁾	4	<0.0010	0
m & p-Xylene	56 ⁽¹⁾	4	<0.0010	0
o-Xylene	60 ⁽¹⁾	4	<0.0010	0
Asbestos	Presence	4	NAD	0

⁽¹⁾ = LQM CIEH Suitability 4 Use Levels (S4UL Nov 2014 (Revised August 2015) – Residential with home grown produce – 1% SOM), ⁽²⁾ = C4SL Values (Residential with home grown produce), ⁽³⁾ = ATRISK^{SOIL} SSV. * = Site Value (C_M) less than analytical detection limit, NAD = No asbestos detected

8.0 Ground Contamination Risk Assessment (Cont'd)

8.2 Level 1 Risk Assessment (Human Health): -

The results of the analysis and risk assessment have identified the following: -

- None of the samples tested exceed the Maximum Concentration (C_M) for the chosen Critical Concentration (C_C) values for this site.
- No asbestos has been identified within the samples tested.

Consequently, made ground soils are not considered to represent a significant risk to human health where exposure pathways are available, and they can remain on site without treatment, protection measures and / or further risk assessment.

8.3 Controlled Waters Risk Assessment: -

The following hydrogeological and hydrological issues have been taken into consideration when assessing the risks towards Controlled Waters:

- There was no visual or olfactory evidence of hydrocarbon / fuel derived contamination noted in the boreholes.
- There was no 'free product' recorded during the investigation.
- No elevated contamination results recorded.
- The site is not situated within c.1km of a Source Protection Zone.
- There are no current Water Abstractions recorded within c.1km of the site boundary.
- The solid geology (Bolling Mudstone Member) is classified as a Secondary B Aquifer.
- The superficial deposits (Glacial Till) are classified as a Secondary (Undifferentiated) Aquifer.
- There are 6 no. surface water features within c.250m of the site, the nearest records relate to Mill Brook c.100m east of the site.
- The proposed development comprising significant areas of hardcover therefore reducing surface infiltration.

Consequently, the risk to Controlled Waters from on-site contamination is considered to be negligible with no plausible sources available and therefore no further works are considered necessary with this regard.

8.4 Revised Conceptual Site Model (RCSM): -

From the findings of the previous Phase 1 Desk Top Study, combined with the results of the intrusive investigation and contamination testing, a Revised Conceptual Site Model (RCSM) has been developed for the site and is illustrated in Table 8.2 on the following page.

8.0 Ground Contamination Risk Assessment (Cont'd)

8.4 Revised Conceptual Site Model (RCSM): -

Table 8.2

	<i>Sources (S)</i>		<i>Pathways (P)</i>		<i>Receptors (R)</i>
S1	Made ground associated with previous and current development. (No elevated concentrations recorded)	P1	Ingestion & Dermal Contact.	R1	Human health - future end users and construction workforce.
		P2	Plant uptake and attached soils.		
S2	Hazardous ground gas production associated with the recent infilling of land surrounding the site. (No elevated concentrations recorded. Minimum 2 no. further visits to be completed)	P3	Air-inhalation of vapours and direct contact with dust.	R2	Controlled Waters: Groundwater within the underlying superficial deposits (Secondary Aquifer – Undifferentiated) and solid geology (Secondary Aquifer – B). (Not considered to be at risk)
		P4	Migration through existing services / permeable strata.		
		P5	Direct contact with building Materials.	R3	Adjacent sites.
		P6	Surface runoff, infiltration & leachate migration.	R4*	Building materials.
				R5*	Flora and fauna.

* = Not included in the Human Health & Controlled Waters Risk Assessment.

8.4.1 Sources: -

The site is generally covered by a layer of made ground which represents a potential source of ground contamination for this site. The made ground generally contains anthropogenic debris i.e., brick and ash. These materials have been assessed using a standard generic soil suite, with the insitu made ground within the site considered as a single averaging area for these analytes.

When considering the potential risks associated with Radon gas, the Envirocheck Report obtained as part of the Phase I Desk Study confirms that the site is within an area where less than 1% of homes are at or above the action level for radon, and confirms that radon protection measures are not required to be installed at the site.

8.4.2 Pathways: -

When considering the proposed end use, and without considering treatment, removal or protection measures, there are some potential plausible pathways available for direct contact, dermal contact, ingestion, inhalation, wind (dust / particulate), volatilization, and vertical and lateral transportation below the site, where there is no hardcover present.

Within the CLEA Risk Assessment Model for Human Health, there are 3 exposure mediums considered for on-site receptors, comprising ingestion of soil containing contaminants, inhalation of contaminated dust / vapours and dermal contact, with up to 10 no. exposure pathways considered, as shown below.

- 1. Ingestion of soil and indoor dust 2. Consumption of homegrown produce and attached soil 3. Dermal contact (indoor) 4. Dermal contact (outdoor) 5. Inhalation of dust (indoor) 6. Inhalation of dust (outdoor) 7. Inhalation of vapour (indoor) 8. Inhalation of vapour (outdoor) 9. Oral background intake 10. Inhalation background intake.

8.0 Ground Contamination Risk Assessment (Cont'd)

8.4 Revised Conceptual Site Model (RCSM) (Cont'd): -

8.4.2 Pathways (Cont'd): -

Where the future site has hard cover and below new structures, a number of these pathways may not be available. In addition, when considering the potential pathways for leachate migration, where either hard cover and / or future surface water drainage systems are present, the potential effects of surface infiltration or contaminated surface water runoff will be greatly reduced. Similarly, when considering the construction work force, exposure pathways through direct contact, ingestion and dust inhalation will be available during part of the construction process, and therefore adequate PPE should be provided to protect the workforce during this period.

8.4.3 Receptors: -

Within the CLEA Risk Assessment Model for Human Health, the potential receptors are assessed initially on-site end use, followed by a delineation of age category (i.e., child or adult), with default settings for *Residential*, *Allotment* and *Public Open Space (Park)* end uses based on a child aged 0 to 6 years, *Public Open Space (Residential)* based on a child aged 3 to 9 and *Commercial* end uses based upon a working exposure period of up to 49 years (i.e., 16 to 65). Key generic assumptions for *Residential* and *Public Open Space (Residential)* are based upon a typical residential property, consisting of a two-storey small, terraced house, with private garden, and a *Commercial* end use based upon a typical commercial or light industrial property, consisting of a three-storey office building (pre-1970). No buildings are anticipated for *Allotment* or *Public Open Space (Park)* end uses. Within the CLEA Risk Assessment Model for Human Health there are 6 no. generic end use categories presently in use, as follows:

- 1) *Residential - with home grown produce*, 2) *Residential - without home grown produce*, 3) *Allotments*, 4) *Commercial*
- 5) *Public Open Space – Residential*, 6) *Public Open Space - Park*

For this Level 1 Risk Assessment when considering the sensitivity of the site the most appropriate end use category for this site has been taken as:

- 1) *Residential with home grown produce*

9.0 Conclusions & Recommendations

9.1 Ground Conditions: -

Made ground was identified in all windowless sampling boreholes and trial pit locations and ranged in thickness from ground level to depths of between c.0.50m and c.1.20m below current ground levels (bcgl) generally comprising sandy gravel, sandy gravelly soil and sandy gravelly clay with fragments of brick, ash, sandstone, limestone and quartzite. No visual or olfactory evidence of significant contamination (i.e. fuels, oils or asbestos containing materials) was encountered during the intrusive investigation.

Natural superficial deposits were encountered in two of the windowless sampling boreholes (WS02 and WS03) and both trial pit locations, and comprised reddish brown sandy gravelly clay and reddish brown sand respectively. The deposits were identified to depths of between c.1.40m and c.1.60m bcgl within the windowless sampling boreholes, and to at least c.1.35m within the trial pits.

9.0 Conclusions & Recommendations (Cont'd)

9.1 Ground Conditions (Cont'd): -

Solid geology was encountered within all of the windowless sampling boreholes from depths of between c.1.00m and c.1.60m bcgl, and generally comprised light grey highly weathered mudstone. All of the windowless sampling boreholes were terminated within the mudstone bedrock at depths of between c.2.87m and c.3.34m bcgl upon refusal of the sampling equipment.

9.2 Groundwater & Stability: -

During the intrusive investigation, water strikes were not encountered in the boreholes, with the exception of WS04 where slight water ingress was noted at c.0.15m bcgl. In addition, groundwater levels between c.1.09m and c.1.45m bcgl have been recorded within the monitoring wells in boreholes WS01 and WS03 during the first two rounds of monitoring. The water ingress and standing water levels within the monitoring wells are attributed to trapped / perched groundwater.

Consequently, shallow water ingresses are likely to occur within shallow construction related excavations and therefore provision should be made for the introduction of suitable groundwater control measures, in order to take care of any ingresses of groundwater which may occur, especially during the wetter periods of the year.

The trial pits and windowless sampling boreholes remained stable throughout the intrusive investigation works. However, suitable trench support should be implemented in any foundation excavations / service trenches to be dug during the development works.

9.3 Waste Classification Analysis: -

The made ground materials encountered beneath this site which may have to be discarded as a waste to landfill, have been assessed using Technical Guidance WM3 'Guidance on the classification and assessment of Waste', in conjunction with the on-line waste classification software tool HazWasteOnline™.

Each sample has been assessed separately to determine whether all the soils can be considered as a single waste stream or whether the different sources represent separate waste streams.

Based on the physical (visual and olfactory) inspection of the samples recovered from the boreholes and trial pits, representative samples have been assessed as either 17 05 03 (waste soil and stones containing hazardous substances) or 17 05 04 (waste soil and stones other than those mentioned in 17 05 03) from the WM3 List of Waste (LoW).

In order to determine which waste code applies to each sample, the results of the laboratory testing have been assessed using the HazWasteOnline™ software. The results are summarised in Table 9.1 below and the full Waste Classification Report can be found attached in Appendix IV.

Table 9.1

<u>Position</u>	<u>Depth (m)</u>	<u>Classification</u>	<u>Waste Code</u>
WS01	0.40	Non-Hazardous	17 05 04
WS01	0.90	Non-Hazardous	17 05 04
WS03	0.40	Non-Hazardous	17 05 04
WS04	0.30	Non-Hazardous	17 05 04

The results of this assessment have identified that the made ground deposits tested can be classified as Non-Hazardous Waste.

9.0 Conclusions & Recommendations (Cont'd)

9.3 Waste Classification Analysis (Cont'd): -

In addition, as the TOC values were all below 3%, two of the samples were subject to further WAC screening to determine if these materials would meet the criteria for disposal at an inert waste facility. The results are included within the Eurofins Chemtest Report 25-08226-2 and confirm the samples tested do meet the criteria for disposal at an inert waste facility.

The waste classification report and the results of the contamination screening should be forwarded on to the chosen landfill for their comment and assessment. It should be noted that this Waste Classification Report is only applicable to those made ground materials which have been sampled and screened as part of the assessment. If materials, other than those covered by this report, are to be discarded from site as a waste to landfill or there is a significant increase in the volume of materials to be discarded, then these additional materials will also need to be assessed using Technical Guidance WM3: Guidance on the classification and assessment of Waste.

9.4 Foundation Options: -

When considering the ground conditions encountered, it is thought that conventional strip and pad footings should be suitable for the proposed development, founded within the Mudstone bedrock identified at top depth of between c.1.00m and c.1.60m bcgl, where a maximum allowable bearing pressure of 150kN/m² is available. This may result in foundation depths up to c.1.60m bcgl.

When considering the results of the pH and soluble sulphate testing, future foundations and buried concrete on the site can be constructed utilising a concrete design class of DS-2 and ACEC class of AC-2.

9.5 Ground Contamination Assessment: -

From the results of the contamination screening and risk assessment carried out (section 8.2 and 8.3), the made ground recorded on site is not considered to pose a risk to Human Health or controlled waters, and can remain on site without requiring any treatment, protection and / or further risk assessment.

The contamination screening results can also be used by the Main Contractor / Project Coordinator, when devising an adequate Site Health & Safety Plan, in accordance with current CDM Regulations. For further guidance reference should be made to the Health and Safety Executive (HSE) document EH40 / 2005 Workplace exposure limits.

9.6 Gas Protection Measures: -

Preliminary gas monitoring results indicate that the site is likely to be classified as Characteristic Situation 1 (CS1), resulting in no gas protection measured being required. However this will be confirmed in an addendum report which will be issued upon completion of the gas monitoring programme.

The site is within an area where <1% of homes are at or above the action level for radon, and radon protection measures are not required to be installed at the site.

9.0 Conclusions & Recommendations (Cont'd)

9.7 General Comments: -

Where we have sampled and tested for asbestos this is discussed in the report. Whilst we would target any asbestos sampling and testing in accordance with a Conceptual Site Model and site findings, there is always the possibility, along with other contamination, that undiscovered asbestos exists between sample locations and the possibility of unknown asbestos exists on all sites.

In particular brownfield sites where previous buildings have been demolished, there were previous features that were infilled (old hollows, pits, etc.) or where significant quantities of materials such as demolition and brick rubble exist.

For future site works, adequate lateral trench support will be required for excavations, to prevent trench wall collapse or over excavations, as well as to create a safe working environment, and any excavations on this site should remain open for as short a period as possible, since some of these materials may be susceptible to deterioration, if left open to the natural elements for any significant period.

When considering the new extension, advice from a suitably experienced structural engineer should be sought to ensure any proposed new foundations do not overstress and / or undermine any existing foundations.

In addition, for deeper excavations, drainage, service runs or the like that may pass close to or beneath any proposed new foundations, these should be undertaken with care and completed prior to the preparation of any new foundations, so as not to allow any loose or granular material to move or 'flow', thus causing settlement to occur to any new foundations based at a higher level.

Consideration should also be given to the protection of any new service pipes for the proposed development, and a suite of contamination testing (UKWIR suite) may be required to meet the requirements of the local utilities service provider for their 'pipe selection risk assessment' (PSRA) once the location and depth of future services have been determined.

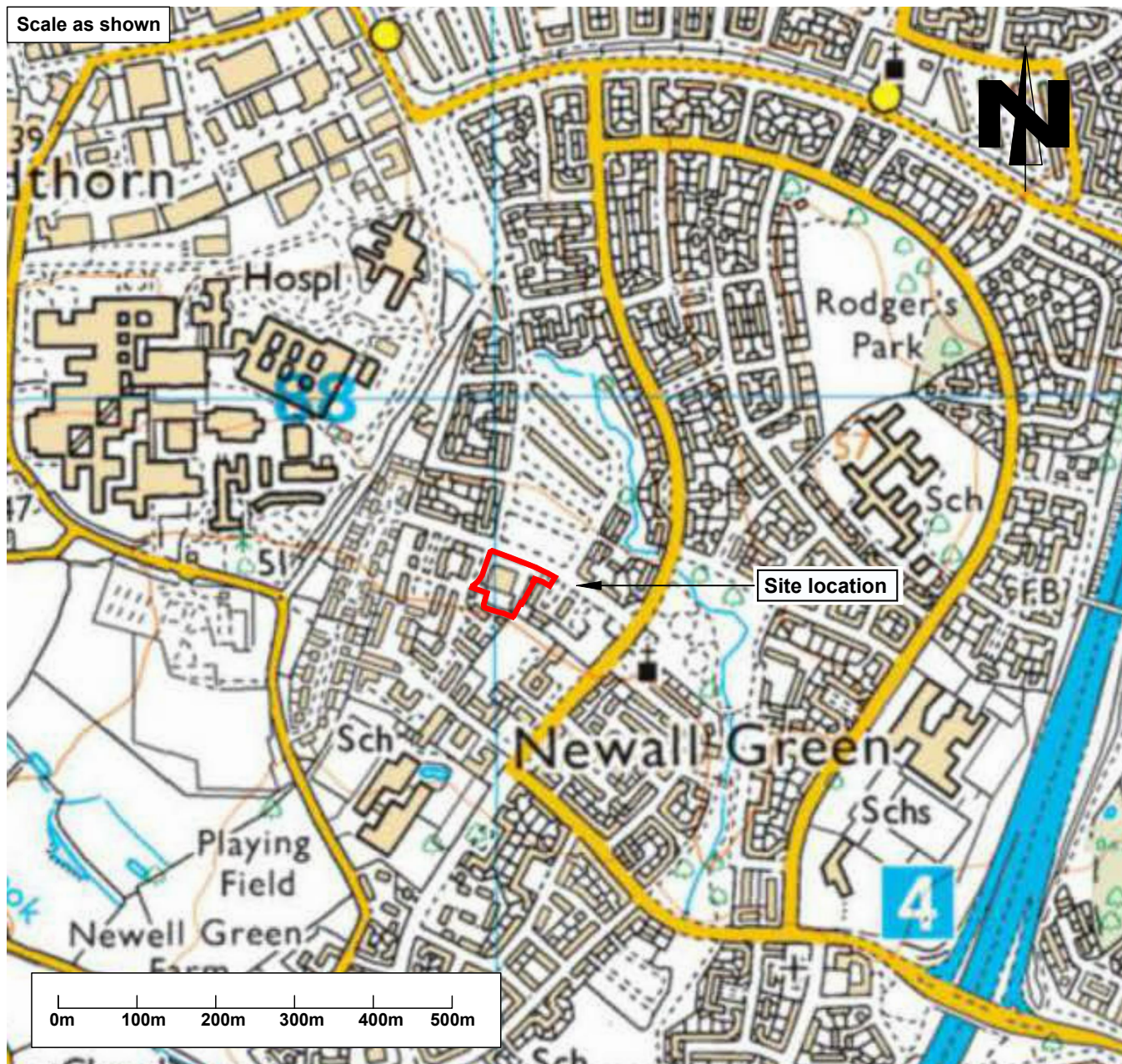
An "observational technique" can be applied to the design and construction of this site, and where ground conditions seem to vary from that indicated from the conceptual ground model derived from works to date, then advice from a suitably qualified Engineer should be sought.

END OF REPORT

APPENDIX I

Location Plan, Aerial Photograph, Existing Layout Plan, Proposed Development Layout Plan

Scale as shown



Client:

ADEPT / JLL

Project Title:

Proposed Extension a& New Building
Millbrook Independent Hospital
Wastdale Road, Manchester, M23 2RX

Drawing Title:

Location Plan

Job Reference:

24-586

Drawing Number:

-

Revision:

Drawn by:

P.D

Date:

15.08.24

Scale at A4:

As shown

Checked by:

B.E

Approved by:

B.E

The contractor shall check all dimensions on site before commencement of any works.
No dimensions to be scaled off this drawing.

© Copyright Reserved

rev.

date

amendments

drawn

chckd

ARC ENVIRONMENTAL LTD

Solum House
Unit 1 Elliott Court
St. John's Road
Meadowfield
Durham
DH7 8PN

Tel: (0191) 378 6380

e-mail: admin@arc-environmental.com

web: www.arc-environmental.com





ARC ENVIRONMENTAL LTD

Solum House
Unit 1 Elliott Court
St. John's Road
Meadowfield
Durham, DH7 8PN
Tel: (0191) 378 6380
e-mail: admin@arc-environmental.com
web: www.arc-environmental.com

The contractor shall check all dimensions on site before commencement of any works. No dimensions to be scaled off this drawing.
© Copyright Reserved

LEGEND	
	APPROXIMATE SITE BOUNDARY

rev.	date	amendments			drawn chkd

Client:
ADEPT / JLL

Project Title:
Proposed Extension and New Building
Millbrook Independent Hospital
Wastdale Road, Manchester, M23 2RX

Drawing Title:

Aerial Photograph

Scale at A3: NTS @ A3	Date: 15.08.24	Drawn by: P.D	Approved by: B.E
--------------------------	-------------------	------------------	---------------------

Job Ref: 24-586	Drg no: —	Rev: —
--------------------	--------------	-----------



ARC ENVIRONMENTAL LTD

Solum House
Unit 1 Elliott Court
St. John's Road
Meadowfield
Durham, DH7 8PN
Tel: (0191) 378 6380
e-mail: admin@arc-environmental.com
web: www.arc-environmental.com

The contractor shall check all dimensions on site before commencement of any works. No dimensions to be scaled off this drawing.
© Copyright Reserved

LEGEND	
	APPROXIMATE SITE BOUNDARY

rev.	date	amendments	drawn	chckd

Client: **ADEPT / JLL**

Project Title:
Proposed Extension and New Building
Millbrook Independent Hospital
Wastdale Road, Manchester, M23 2RX

Drawing Title:
Existing Site Layout Plan

Scale at A3: NTS @ A3	Date: 15.08.24	Drawn by: P.D	Approved by: B.E
--------------------------	-------------------	------------------	---------------------

Job Ref: 24-586	Drg no: —	Rev: —
--------------------	--------------	-----------



ARC ENVIRONMENTAL LTD

Solum House
Unit 1 Elliott Court
St. John's Road
Meadowfield
Durham, DH7 8PN
Tel: (0191) 378 6380
e-mail: admin@arc-environmental.com
web: www.arc-environmental.com

The contractor shall check all dimensions on site before commencement of any works. No dimensions to be scaled off this drawing.
© Copyright Reserved

LEGEND	
	TOTAL OWNERSHIP BOUNDARY
	AREA OF EXTENSION / NEW DEVELOPMENT

01	07.10.24	REVISED LAYOUT INCLUDED	P.D	B.E
rev.	date	amendments	drawn	chckd

Client: **ADEPT / JLL**

Project Title:
Proposed Extension and New Building
Millbrook Independent Hospital
Wastdale Road, Manchester, M23 2RX

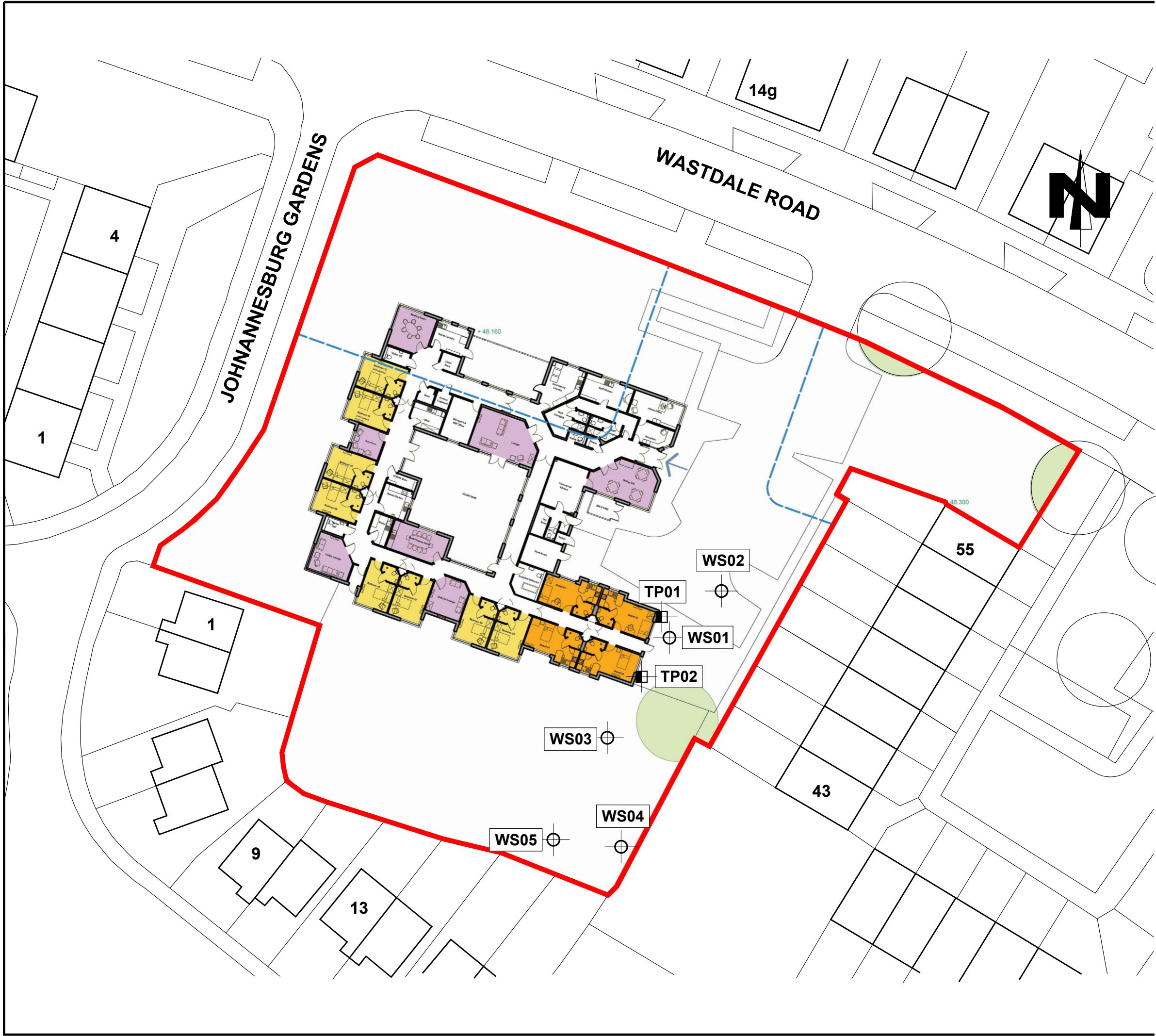
Drawing Title:
Proposed Development Layout Plan

Scale at A3: NTS @ A3	Date: 15.08.24	Drawn by: P.D	Approved by: B.E
--------------------------	-------------------	------------------	---------------------

Job Ref: 24-586	Drg no: -	Rev: 01
--------------------	--------------	------------

APPENDIX II

Exploratory Hole Location Plan, Borehole Record Sheets, and Foundation Detail Record Sheets



ARC ENVIRONMENTAL LTD

Solum House
Unit 1 Elliott Court
St. John's Road
Meadowfield
Durham, DH7 8PN
Tel: (0191) 378 6380
e-mail: admin@arc-environmental.com
web: www.arc-environmental.com

The contractor shall check all dimensions on site before commencement of any works. No dimensions to be scaled off this drawing.
© Copyright Reserved

LEGEND	
	APPROXIMATE SITE BOUNDARY
	WINDOWLESS SAMPLING BOREHOLE LOCATION
	MANUALLY EXCAVATED FOUNDATION INSPECTION PIT

rev.	date	amendments	drawn	chckd

Client: **ADEPT / JLL**

Project Title:
Proposed Extension and New Building
Millbrook Independent Hospital
Wastdale Road, Manchester, M23 2RX

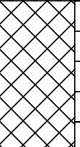
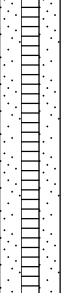
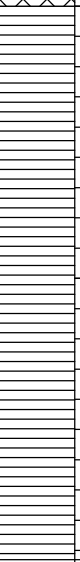
Drawing Title:
Exploratory Hole Location Plan (Existing Layout)

Scale at A3: NTS @ A3	Date: 18.03.25	Drawn by: P.D	Approved by: T.W
--------------------------	-------------------	------------------	---------------------

Job Ref: 24-586	Drg no: -	Rev: -
--------------------	--------------	-----------

**BOREHOLE LOG**

Project Millbrook Hospital				BOREHOLE No WS01	
Job No 24-586	Date 06-03-25 06-03-25	Ground Level (m)	Co-Ordinates ()		
Contractor Arc Environmental Ltd				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.40	J/D					(0.60) 0.60	Grass over medium brown sandy gravelly clay. Sand is fine to medium, gravel is angular fine to coarse brick, ash and sandstone (MADE GROUND)		
0.90	J/D					(0.50) 1.10	Soft medium brown sandy gravelly clay. Sand is fine to medium, gravel is angular to sub-rounded fine to coarse sandstone (MADE GROUND)		
1.20-1.80	D/B					(1.83) 2.93	Very weak highly weathered reddish brown mottled light grey MUDSTONE		
1.65-2.10	SPT	N=6							
2.00-2.50	D/B								
2.15-2.60	SPT	N=35							
2.60-2.93	SPT	71 blows for 330mm							

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											WATER: Borehole remained dry.
All dimensions in metres Scale 1:25			Client JLL Planning / Adept Consulting Engineers			Method/ Plant Used Windowless Sampling Borehole			Logged By TW		

**BOREHOLE LOG**

Project Millbrook Hospital				BOREHOLE No WS02	
Job No 24-586	Date 06-03-25 06-03-25	Ground Level (m)	Co-Ordinates ()		
Contractor Arc Environmental Ltd				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.20-0.20	J/D					0.07	ASPHALT HARDSTANDING (MADE GROUND)		
						0.14	Medium grey limestone gravel sub-base (MADE GROUND)		
						(0.46)	Orangish brown mottled light grey clayey sandy gravel. Sand is fine to medium, gravel is angular fine to coarse sandstone and quartzite (MADE GROUND)		
						0.60			
1.00	D/B					(1.00)	Reddish brown mottled light grey sandy gravelly CLAY. Sand is fine to medium, gravel is sub-angular fine to coarse mudstone		
1.60-2.00 1.65-2.10	D/B SPT	N=7				1.60	Very weak highly weathered reddish brown mottled light grey MUDSTONE		
						(1.27)			
2.45-2.87	SPT	66 blows for 420mm				2.87			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											WATER: Borehole remained dry.
All dimensions in metres Scale 1:25			Client JLL Planning / Adept Consulting Engineers			Method/ Plant Used Windowless Sampling Borehole			Logged By TW		

**BOREHOLE LOG**

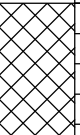
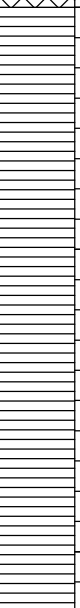
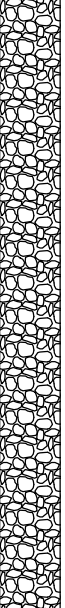
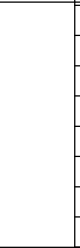
Project Millbrook Hospital				BOREHOLE No WS03	
Job No 24-586	Date 06-03-25 06-03-25	Ground Level (m)	Co-Ordinates ()		
Contractor Arc Environmental Ltd				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.10	J/D					(0.27) 0.27	Grass over dark brown topsoil with fragments of brick and many rootlets (MADE GROUND)		
0.40	J/D					(0.23) 0.50	Medium grey sandy gravel. Sand is fine to coarse, gravel is angular fine to coarse quartzite (MADE GROUND)		
0.70	B					(0.90) 1.40	Reddish brown mottled light brown medium SAND		
1.60-2.00 1.65-2.10	D/B SPT	N=13				(1.94) 3.34	Very weak highly weathered reddish brown mottled light grey MUDSTONE		
2.45-2.90	SPT	N=20							
2.95-3.34	SPT	70 blows for 385mm							

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											WATER: Borehole remained dry.
All dimensions in metres Scale 1:25			Client JLL Planning / Adept Consulting Engineers			Method/ Plant Used Windowless Sampling Borehole			Logged By TW		

**BOREHOLE LOG**

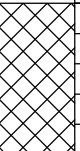
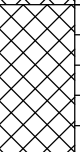
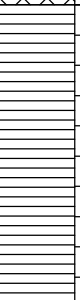
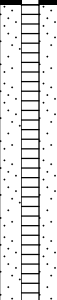
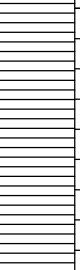
Project Millbrook Hospital				BOREHOLE No WS04	
Job No 24-586	Date 06-03-25 06-03-25	Ground Level (m)	Co-Ordinates ()		
Contractor Arc Environmental Ltd				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.30	J/D					0.45	Grass over dark brown topsoil with fragments of brick and many rootlets (MADE GROUND)		
0.80-1.20	D/B					1.20	Orangish brown mottled light grey clayey sandy gravel. Sand is fine to medium, gravel is angular fine to coarse sandstone and quartzite (MADE GROUND)		
1.50-2.00 1.65-2.10	B SPT	N=11				(1.99)	Very weak highly weathered reddish brown mottled light grey MUDSTONE		
2.45-2.90	SPT	N=30				3.19			
2.85-3.19	SPT	69 blows for 335mm							

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											WATER: Perched water encountered at c.0.15m bcgl.
All dimensions in metres Scale 1:25			Client JLL Planning / Adept Consulting Engineers			Method/ Plant Used Windowless Sampling Borehole			Logged By TW		

**BOREHOLE LOG**

Project Millbrook Hospital				BOREHOLE No WS05	
Job No 24-586	Date 06-03-25 06-03-25	Ground Level (m)	Co-Ordinates ()		
Contractor Arc Environmental Ltd				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.30	J/D					(0.50) 0.50	Grass over dark brown topsoil with fragments of brick and many rootlets (MADE GROUND)		
0.80-1.20	D/B					(0.50) 1.00	Orangish brown mottled light grey clayey sandy gravel. Sand is fine to medium, gravel is angular fine to coarse sandstone and quartzite (MADE GROUND)		
1.50-2.00 1.65-2.10	D/B SPT	N=11				(1.89)	Very weak highly weathered reddish brown mottled light grey MUDSTONE		
2.45-2.89	SPT	59 blows for 443mm				2.89			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											WATER: Borehole remained dry.
All dimensions in metres Scale 1:25			Client JLL Planning / Adept Consulting Engineers			Method/ Plant Used Windowless Sampling Borehole			Logged By TW		

Indicative internal detail

Wall construction detail unknown

External brick wall

ground level

c.750mm

c.550mm

830mm bgl

Concrete footing at least c.600mm thick

c.600mm

1350mm bgl

0-830mm: Grass over medium brown sandy gravelly clay. Sand is fine to medium, gravel is angular fine to coarse brick, ash and sandstone (MADE GROUND)

830-1350mm: Reddish brown sandy gravelly CLAY. Sand is fine to medium, gravel is sb-angular fine to coarse mudstone



Solum House
Unit 1 Elliott Court
St. John's Road
Meadowfield
Durham, DH7 8PN
Tel: (0191) 378 6380
e-mail: admin@arc-environmental.com
web: www.arc-environmental.com

The contractor shall check all dimensions on site before commencement of any works. No dimensions to be scaled off this drawing.

rev	date	amendments	drawn	chckd
-----	------	------------	-------	-------

Client:

ADEPT / JLL

Project Title:

Project title:
Proposed Extension and New Building
Millbrook Independent Hospital
Wastdale Road, Manchester, M23 2RX

Drawing Title:

Foundation Detail Record Sheet 1

Scale at A3:	Date:	Drawn by:	Approved by:
As shown	18.03.25	P.D	T.W

Job Ref:	Drg no:	Rev:
24-586	—	—

The diagram illustrates a cross-section of a wall and its foundation. The wall consists of an internal section (hatched with diagonal lines) and an external brick wall (hatched with horizontal lines). The wall construction detail is noted as 'Wall construction detail unknown'. The external brick wall is labeled 'External brick wall'. The wall sits on a concrete footing, which is labeled 'Concrete footing at least c.550mm thick'. The footing is shown with a cross-hatched pattern. The diagram includes several horizontal reference lines: 'ground level' (indicated by a dashed line), '800mm bgl' (below ground level), '1100mm bgl' (below ground level), and '1350mm bgl' (below ground level). Vertical dimensions are provided: 'c.800mm' for the wall height above ground level, 'c.370mm' for the wall thickness, and 'c.550mm' for the footing thickness. An 'Indicative internal detail' is shown on the left side of the wall.

0-800mm: Grass over medium brown sandy gravelly clay. Sand is fine to medium, gravel is angular fine to coarse brick, ash and sandstone (MADE GROUND)

800-1100mm:
Medium brown SAND

1100-1350mm: Reddish brown sandy gravelly CLAY. Sand is fine to medium, gravel is sb-angular fine to coarse mudstone



Solum House
Unit 1 Elliott Court
St. John's Road
Meadowfield
Durham, DH7 8PN
Tel: (0191) 378 6380
e-mail: admin@arc-environmental.com
web: www.arc-environmental.com

The contractor shall check all dimensions on site before commencement of any works. No dimensions to be scaled off this drawing.

rev	date	amendments	drawn	chckd
-----	------	------------	-------	-------

Client:

ADEPT / JLL

Project Title:

Project Title:
Proposed Extension and New Building

Millbrook Independent Hospital

Wastdale Road, Manchester, M23 2RX

Drawing Title:

Foundation Detail Record Sheet 2

Scale at A3:	Date:	Drawn by:	Approved by:
As shown	18.03.25	P.D	T.W

Job Ref:	Drg no:	Rev:
24-586	—	—

APPENDIX III

Laboratory Results (Geotechnical & Ground Contamination) & Gas Monitoring Sheets



Amended Report

Report No.: 25-08226-2

Initial Date of Issue: 23-Mar-2025 **Date of Re-Issue:** 22-Apr-2025

Re-Issue Details: This report has been revised and directly supersedes 25-08226-1 in its entirety

Client: Arc Environmental Ltd

Client Address: Solum House
Unit 1 Elliott Court
St Johns Road
Meadowfield
Durham
DH7 8PN

Contact(s): Results

Project: 24-586 Milbrook Hospital, Manchester

Quotation No.: Q24-36354 **Date Received:** 10-Mar-2025

Order No.: **Date Instructed:** 14-Apr-2025

No. of Samples: 8

Turnaround (Wkdays): 5 **Results Due:** 18-Apr-2025

Date Approved: 22-Apr-2025

Approved By:

Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: 24-586 Milbrook Hospital, Manchester

Client: Arc Environmental Ltd		Chemtest Job No.:		25-08226	25-08226	25-08226	25-08226	25-08226	25-08226	25-08226	25-08226	25-08226
Quotation No.: Q24-36354		Chemtest Sample ID.:		1944901	1944902	1944903	1944904	1944905	1944906	1944907		
		Sample Location:		WS01	WS01	WS03	WS04	WS01	WS02	WS02		
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
		Top Depth (m):		0.4	0.9	0.4	0.3	1.2	1	1.6		
		Bottom Depth (m):						1.6		2		
		Date Sampled:		06-Mar-2025	06-Mar-2025	06-Mar-2025	06-Mar-2025	06-Mar-2025	06-Mar-2025	06-Mar-2025		
		Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM					
Determinand	HWOL Code	Accred.	SOP	Units	LOD							
Moisture		N	2030	%	0.020	14	9.6	9.5	15	13	12	11
Arsenic		M	2455	mg/kg	0.5	9.9	8.3	7.6	19			
Cadmium		M	2455	mg/kg	0.10	< 0.10	0.49	1.1	0.41			
Chromium		M	2455	mg/kg	0.5	26	16	17	28			
Chromium (Trivalent)		N	2490	mg/kg	1.0	26	16	17	28			
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50			
Copper		M	2455	mg/kg	0.50	29	21	21	59			
Mercury		M	2455	mg/kg	0.05	0.10	0.12	0.10	0.39			
Nickel		M	2455	mg/kg	0.50	27	19	17	26			
Lead		M	2455	mg/kg	0.50	33	36	39	110			
Selenium		M	2455	mg/kg	0.25	0.56	0.58	0.36	0.81			
Zinc		M	2455	mg/kg	0.50	54	57	59	120			
pH at 20C		M	2010		4.0	[B] 7.8	7.8	7.9	[B] 7.5	7.9	8.4	
Sulphate (2:1 Water Soluble) as SO4 mg/l		M	2120	mg/l	10.000	[B] < 10	< 10	< 10	[B] < 10	< 10	< 10	< 10
Cyanide (Free)		M	2300	mg/kg	0.50	[B] < 0.50	< 0.50	< 0.50	[B] < 0.50			
Total Organic Carbon		M	2625	%	0.20	[B] 1.3	0.50	1.8	[B] 2.1			
Acenaphthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Anthracene		M	2800	mg/kg	0.10	0.26	< 0.10	< 0.10	0.22			
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Benzo[a]anthracene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.61			
Benzo[a]pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Chrysene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.60			
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Fluoranthene		M	2800	mg/kg	0.10	1.1	< 0.10	< 0.10	1.4			
Fluorene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Naphthalene		M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10			
Phenanthrene		M	2800	mg/kg	0.10	1.1	< 0.10	< 0.10	0.76			
Pyrene		M	2800	mg/kg	0.10	1.0	< 0.10	< 0.10	1.3			
Total Of 16 PAH's		N	2800	mg/kg	2.0	3.5	< 2.0	< 2.0	4.9			
ACM Type		N	2192		N/A	-	-	-	-			
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected			
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown

Results - Soil

Project: 24-586 Milbrook Hospital, Manchester

Client: Arc Environmental Ltd		Chemtest Job No.:		25-08226	25-08226	25-08226	25-08226	25-08226	25-08226	25-08226	25-08226	25-08226
Quotation No.: Q24-36354		Chemtest Sample ID.:		1944901	1944902	1944903	1944904	1944905	1944906	1944907		
		Sample Location:		WS01	WS01	WS03	WS04	WS01	WS02	WS02		
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
		Top Depth (m):		0.4	0.9	0.4	0.3	1.2	1	1.6		
		Bottom Depth (m):						1.6		2		
		Date Sampled:		06-Mar-2025	06-Mar-2025	06-Mar-2025	06-Mar-2025	06-Mar-2025	06-Mar-2025	06-Mar-2025		
		Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM					
Determinand	HWOL Code	Accred.	SOP	Units	LOD							
Other Material		N	2040		N/A	Stones	Stones	Stones	Stones and Roots	Stones	Stones	Stones
Soil Texture		N	2040		N/A	Clay	Loam	Loam	Loam	Clay	Clay	Clay
pH (2.5:1) at 20C		N	2010		4.0							8.9
Magnesium (Water Soluble)		N	2120	g/l	0.010							< 0.010
Total Sulphur		U	2175	%	0.010							0.010
Chloride (Water Soluble)		M	2220	g/l	0.010							0.031
Nitrate (Water Soluble)		N	2220	g/l	0.010							< 0.010
Sulphate (Acid Soluble)		U	2430	%	0.010							< 0.010
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	[B] < 0.05	< 0.05	< 0.05	[B] < 0.05			
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	[B] < 0.05	< 0.05	< 0.05	[B] < 0.05			
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	[B] < 0.05	< 0.05	< 0.05	[B] < 0.05			
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	[B] < 0.10	< 0.10	< 0.10	[B] < 0.10			
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	[B] < 0.05	< 0.05	< 0.05	[B] < 0.05			
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	[B] < 0.25	< 0.25	< 0.25	[B] < 0.25			
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	[B] < 2.0	< 2.0	< 2.0	[B] < 2.0			
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	[B] < 1.0	< 1.0	< 1.0	[B] < 1.0			
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	[B] 2.0	2.3	< 2.0	[B] < 2.0			
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	[B] 5.4	8.8	15	[B] 12			
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	[B] < 10	< 10	< 10	[B] 13			
Aliphatic EPH >C40-C44 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	[B] < 10	< 10	< 10	[B] < 10			
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	[B] 7.4	11	17	[B] 12			
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	[B] < 10	11	17	[B] 25			
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	[B] < 0.05	< 0.05	< 0.05	[B] < 0.05			
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	[B] < 0.05	< 0.05	< 0.05	[B] < 0.05			
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	[B] < 0.05	< 0.05	< 0.05	[B] < 0.05			
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	[B] < 0.25	< 0.25	< 0.25	[B] < 0.25			
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	[B] < 1.0	< 1.0	< 1.0	[B] < 1.0			
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	[B] < 1.0	< 1.0	< 1.0	[B] < 1.0			
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	[B] 10	9.7	9.6	[B] 4.5			
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	[B] 4.0	6.2	11	[B] 29			
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	[B] 2.4	2.0	3.9	[B] 6.6			
Aromatic EPH >C40-C44 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	[B] < 10	< 10	< 10	[B] < 10			
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	[B] 15	16	20	[B] 33			
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	[B] 17	18	24	[B] 40			
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	[B] < 0.50	< 0.50	< 0.50	[B] < 0.50			
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	[B] 22	27	38	[B] 45			
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	[B] 24	29	42	[B] 65			

Results - Soil

Project: 24-586 Milbrook Hospital, Manchester

Client: Arc Environmental Ltd		Chemtest Job No.:						25-08226	25-08226	25-08226	25-08226	25-08226	25-08226	25-08226
Quotation No.: Q24-36354		Chemtest Sample ID.:						1944901	1944902	1944903	1944904	1944905	1944906	1944907
		Sample Location:						WS01	WS01	WS03	WS04	WS01	WS02	WS02
		Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):						0.4	0.9	0.4	0.3	1.2	1	1.6
		Bottom Depth (m):										1.6		2
		Date Sampled:						06-Mar-2025	06-Mar-2025	06-Mar-2025	06-Mar-2025	06-Mar-2025	06-Mar-2025	06-Mar-2025
		Asbestos Lab:						DURHAM	DURHAM	DURHAM	DURHAM			
Determinand	HWOL Code	Accred.	SOP	Units	LOD									
Total EPH >C10-C44 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	[B] 24	29	42	[B] 65					
Benzene		M	2760	mg/kg	0.0010	[B] < 0.0010	< 0.0010	< 0.0010	[B] < 0.0010					
Toluene		M	2760	mg/kg	0.0010	[B] < 0.0010	< 0.0010	< 0.0010	[B] < 0.0010					
Ethylbenzene		M	2760	mg/kg	0.0010	[B] < 0.0010	< 0.0010	< 0.0010	[B] < 0.0010					
m & p-Xylene		M	2760	mg/kg	0.0010	[B] < 0.0010	< 0.0010	< 0.0010	[B] < 0.0010					
o-Xylene		M	2760	mg/kg	0.0010	[B] < 0.0010	< 0.0010	< 0.0010	[B] < 0.0010					

Results - Soil

Project: 24-586 Milbrook Hospital, Manchester

Client: Arc Environmental Ltd		Chemtest Job No.:				25-08226
Quotation No.: Q24-36354		Chemtest Sample ID.:				1944908
		Sample Location:				WS03
		Sample Type:				SOIL
		Top Depth (m):				1.6
		Bottom Depth (m):				2
		Date Sampled:				06-Mar-2025
		Asbestos Lab:				
Determinand	HWOL Code	Accred.	SOP	Units	LOD	
Moisture		N	2030	%	0.020	12
Arsenic		M	2455	mg/kg	0.5	
Cadmium		M	2455	mg/kg	0.10	
Chromium		M	2455	mg/kg	0.5	
Chromium (Trivalent)		N	2490	mg/kg	1.0	
Chromium (Hexavalent)		N	2490	mg/kg	0.50	
Copper		M	2455	mg/kg	0.50	
Mercury		M	2455	mg/kg	0.05	
Nickel		M	2455	mg/kg	0.50	
Lead		M	2455	mg/kg	0.50	
Selenium		M	2455	mg/kg	0.25	
Zinc		M	2455	mg/kg	0.50	
pH at 20C		M	2010		4.0	
Sulphate (2:1 Water Soluble) as SO4 mg/l		M	2120	mg/l	10.000	1100
Cyanide (Free)		M	2300	mg/kg	0.50	
Total Organic Carbon		M	2625	%	0.20	
Acenaphthene		M	2800	mg/kg	0.10	
Acenaphthylene		N	2800	mg/kg	0.10	
Anthracene		M	2800	mg/kg	0.10	
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	
Benzo[a]anthracene		M	2800	mg/kg	0.10	
Benzo[a]pyrene		M	2800	mg/kg	0.10	
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	
Chrysene		M	2800	mg/kg	0.10	
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	
Fluoranthene		M	2800	mg/kg	0.10	
Fluorene		M	2800	mg/kg	0.10	
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	
Naphthalene		M	2800	mg/kg	0.10	
Phenanthrene		M	2800	mg/kg	0.10	
Pyrene		M	2800	mg/kg	0.10	
Total Of 16 PAH's		N	2800	mg/kg	2.0	
ACM Type		N	2192		N/A	
Asbestos Identification		U	2192		N/A	
Soil Colour		N	2040		N/A	Brown

Results - Soil

Project: 24-586 Milbrook Hospital, Manchester

Client: Arc Environmental Ltd		Chemtest Job No.: 25-08226				
Quotation No.: Q24-36354		Chemtest Sample ID.: 1944908				
		Sample Location: WS03				
		Sample Type: SOIL				
		Top Depth (m): 1.6				
		Bottom Depth (m): 2				
		Date Sampled: 06-Mar-2025				
		Asbestos Lab:				
Determinand	HWOL Code	Accred.	SOP	Units	LOD	
Other Material		N	2040		N/A	None
Soil Texture		N	2040		N/A	Clay
pH (2.5:1) at 20C		N	2010		4.0	8.1
Magnesium (Water Soluble)		N	2120	g/l	0.010	0.066
Total Sulphur		U	2175	%	0.010	0.010
Chloride (Water Soluble)		M	2220	g/l	0.010	< 0.010
Nitrate (Water Soluble)		N	2220	g/l	0.010	< 0.010
Sulphate (Acid Soluble)		U	2430	%	0.010	0.024
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	
Aliphatic EPH >C40-C44 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	
Aromatic EPH >C40-C44 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	

Results - Soil

Project: 24-586 Milbrook Hospital, Manchester

Client: Arc Environmental Ltd		Chemtest Job No.:	25-08226			
Quotation No.: Q24-36354		Chemtest Sample ID.:	1944908			
		Sample Location:	WS03			
		Sample Type:	SOIL			
		Top Depth (m):	1.6			
		Bottom Depth (m):	2			
		Date Sampled:	06-Mar-2025			
		Asbestos Lab:				
Determinand	HWOL Code	Accred.	SOP	Units	LOD	
Total EPH >C10-C44 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	
Benzene		M	2760	mg/kg	0.0010	
Toluene		M	2760	mg/kg	0.0010	
Ethylbenzene		M	2760	mg/kg	0.0010	
m & p-Xylene		M	2760	mg/kg	0.0010	
o-Xylene		M	2760	mg/kg	0.0010	

Results - Single Stage WAC

Project: 24-586 Milbrook Hospital, Manchester

Project: 24-000 Windsor Hospital, Manchester						Landfill Waste Acceptance Criteria		
Chemtest Job No: 25-08226 Chemtest Sample ID: 1944901 Sample Ref: Sample ID: Sample Location: WS01 Top Depth(m): 0.4 Bottom Depth(m): Sampling Date: 06-Mar-2025						Limits		
						Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Determinand	SOP	HWOL Code	Accred.	Units				
Total Organic Carbon	2625		M	%	[B] 1.3	3	5	6
Loss On Ignition	2610		M	%	2.3	--	--	10
Total BTEX	2760		M	mg/kg	[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815		M	mg/kg	< 0.05	1	--	--
TPH Total WAC	2670	EH_CU_1D_Total	M	mg/kg	[B] < 10	500	--	--
Total (Of 17) PAH's	2800		N	mg/kg	3.5	100	--	--
pH at 20C	2010		M		7.8	--	>6	--
Acid Neutralisation Capacity	2015		N	mol/kg	0.0040	--	To evaluate	To evaluate
Eluate Analysis				10:1 Eluate mg/l	10:1 Eluate mg/kg	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic	1455		U	0.0010	0.0098	0.5	2	25
Barium	1455		U	0.011	0.11	20	100	300
Cadmium	1455		U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455		U	< 0.0005	< 0.0050	0.5	10	70
Copper	1455		U	0.0012	0.012	2	50	100
Mercury	1455		U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455		U	0.0028	0.028	0.5	10	30
Nickel	1455		U	< 0.0005	< 0.0050	0.4	10	40
Lead	1455		U	< 0.0005	< 0.0050	0.5	10	50
Antimony	1455		U	< 0.0005	< 0.0050	0.06	0.7	5
Selenium	1455		U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455		U	0.008	0.083	4	50	200
Chloride	1220		U	1.8	18	800	15000	25000
Fluoride	1220		U	0.46	4.6	10	150	500
Sulphate	1220		U	19	190	1000	20000	50000
Total Dissolved Solids	1020		N	57	570	4000	60000	100000
Phenol Index	1920		U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610		U	4.2	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	6.9
WAC Sample Weight	2000

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 24-586 Milbrook Hospital, Manchester

Chemtest Job No: 25-08226						Landfill Waste Acceptance Criteria Limits		
Chemtest Sample ID: 1944904						Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample Ref:								
Sample ID:								
Sample Location: WS04								
Top Depth(m): 0.3								
Bottom Depth(m):								
Sampling Date: 06-Mar-2025								
Determinand	SOP	HWOL Code	Accred.	Units				
Total Organic Carbon	2625		M	%	[B] 2.1	3	5	6
Loss On Ignition	2610		M	%	5.3	--	--	10
Total BTEX	2760		M	mg/kg	[B] < 0.010	6	--	--
Total PCBs (7 Congeners)	2815		M	mg/kg	< 0.05	1	--	--
TPH Total WAC	2670	EH_CU_1D_Total	M	mg/kg	[B] 95	500	--	--
Total (Of 17) PAH's	2800		N	mg/kg	4.9	100	--	--
pH at 20C	2010		M		7.5	--	>6	--
Acid Neutralisation Capacity	2015		N	mol/kg	0.0040	--	To evaluate	To evaluate
Eluate Analysis				10:1 Eluate mg/l	10:1 Eluate mg/kg	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic	1455		U	0.0019	0.020	0.5	2	25
Barium	1455		U	0.007	0.072	20	100	300
Cadmium	1455		U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455		U	< 0.0005	< 0.0050	0.5	10	70
Copper	1455		U	0.0027	0.027	2	50	100
Mercury	1455		U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455		U	0.0021	0.021	0.5	10	30
Nickel	1455		U	< 0.0005	< 0.0050	0.4	10	40
Lead	1455		U	0.0017	0.017	0.5	10	50
Antimony	1455		U	< 0.0005	< 0.0050	0.06	0.7	5
Selenium	1455		U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455		U	0.009	0.086	4	50	200
Chloride	1220		U	< 1.0	< 10	800	15000	25000
Fluoride	1220		U	0.33	3.3	10	150	500
Sulphate	1220		U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020		N	27	270	4000	60000	100000
Phenol Index	1920		U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610		U	3.8	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	8.8
WAC Sample Weight	2000

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1944901			WS01	06-Mar-2025	B	Amber Glass 250ml
1944901			WS01	06-Mar-2025	B	Amber Glass 60ml
1944901			WS01	06-Mar-2025	B	Plastic Tub 500g
1944904			WS04	06-Mar-2025	B	Amber Glass 250ml
1944904			WS04	06-Mar-2025	B	Amber Glass 60ml
1944904			WS04	06-Mar-2025	B	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter	
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.	RE PW PL LE DW GW
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).	RE PW PL SW DW GW
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation	PL SW GW
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.	
2010	pH Value of Soils	pH at 20°C	pH Meter	
2015	Acid Neutralisation Capacity	Acid Reserve	Titration	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measurement by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.	
2300	Cyanides & Thiocyanate in Soils	Free (or easily liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.	
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection	
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.	

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS. Reported PCB 101 results may contain contributions from PCB 90 due to inseparable chromatography.	
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge	
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge	

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

NEW_ASB	Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL
DURHAM	Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Report Information

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com



LABORATORY REPORT



Contract Number: PSL25/2003

Report Date: 21 March 2025
Client's Reference: 24-586
Client Name: Arc Environmental
Solum House
Unit 1 Elliott Court
St Johns Road, Meadowfield
Durham
DH7 8PN

For the attention of: Thomas White

Contract Title: Millbrook Hospital Manchester

Date Received: 18/03/2025
Date Commenced: 18/03/2025
Date Completed: 21/03/2025

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins
(Managing Director)

R Berriman
(Associate Director)

S Royle
(Laboratory Manager)

L Knight
(Assistant Laboratory Manager)


D Nicholson
(Senior Technician)

T Watkins
(Senior Technician)

5 – 7 Hexthorpe Road,
Hexthorpe,
Doncaster,
DN4 0AR
Tel: 01302 768098
Email: rberriman@prosoils.co.uk
awatkins@prosoils.co.uk

Page 1 of

[illegible]

24-586

SUMMARY OF SOIL CLASSIFICATION TESTS

BS 1377 - Part 2 : 2022 in accordance with BS EN ISO 17892 (as below)

[illegible]

Water Content - BS 1377 - Part 2 : 2022 : Clause 4 in accordance with BS EN ISO 17892 - 1 : 2014 + A1 : 2022

Linear Shrinkage - BS 1377 - Part 2 : 2022 : Clause 7

Particle Density (Gas Jar method) - BS 1377 - Part 2 : 2022 : Clause 9

Liquid, Plastic Limit & Plasticity Index - BS 1377 - Part 2 : 2022 : Clause 5 & 6 in accordance with BS EN ISO 17892 - 12 : 2018 + A2 : 2022

SYMBOLS : NP = Non Plastic



Millbrook Hospital, Manchester

Contract No:

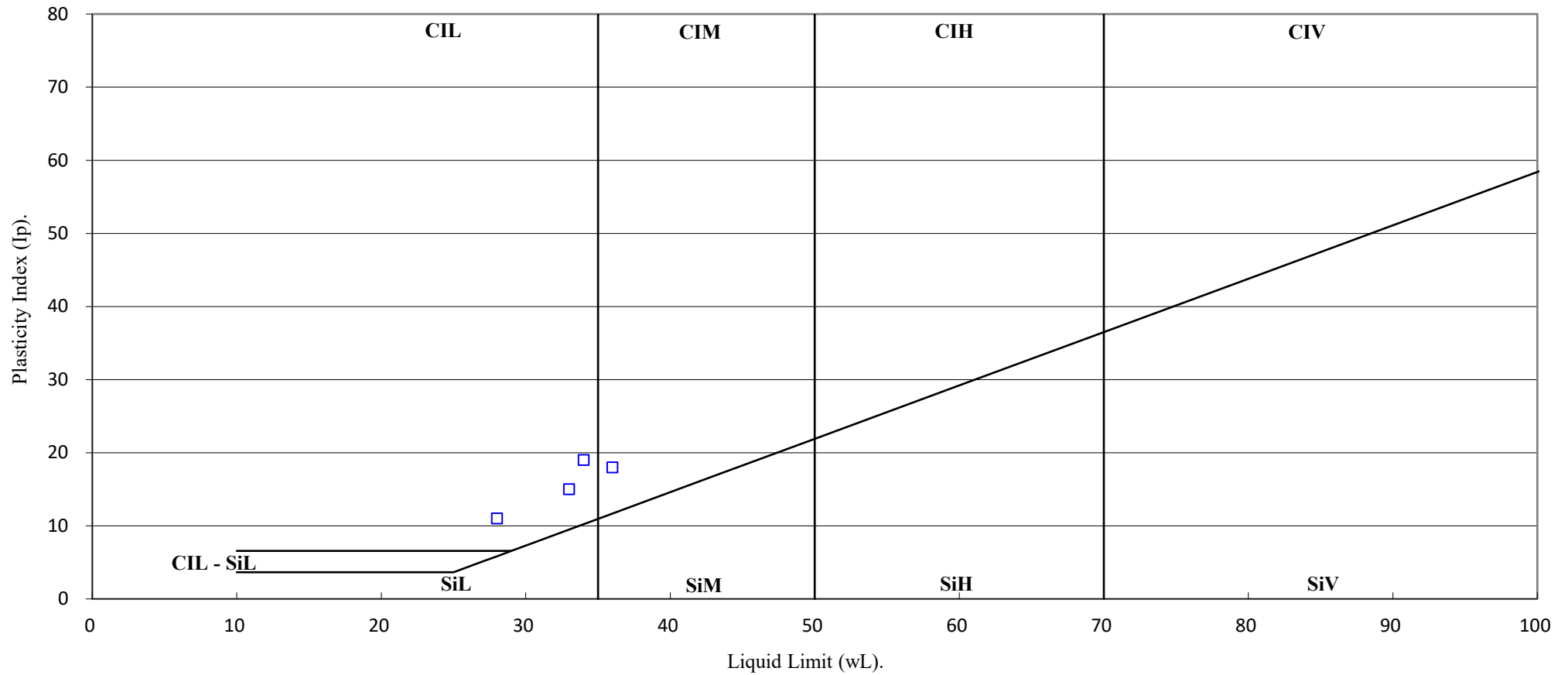
PSL25/2003

Client Ref:

24-586

PLASTICITY CHART

BS EN ISO 14688-2:2017 Clause 4.4



4043



Millbrook Hospital, Manchester

Contract No:

PSL25/2003

Client Ref:

24-586

Site:	MIBROOK HOSPITAL
Ref:	24-586

[illegible]

Notes:

Detection limits - Methane = 0.0%, Carbon Dioxide = 0.0%, LEL = 0.0%, Oxygen = 0.0%, Flow = 0.1l/hr

Monitoring order is from **Left to Right** across table

Monitoring should be for **Not Less** than 3 minutes. However, if high concentrations of gasses initially recorded, monitoring should be for up to 10 minutes.

N/A = Not applicable

= Off the scale

Cf = PID compensation Factor (1-10) - Must be used to multiply the PID reading to give an accurate measure of the total hydrocarbons in the borehole when methane is present

Hex = Hexane (Valid and in range up to 2.000%) - Recorded when abnormally high methane is present.

PID = Photo Ionisation Detector (Calibrated to Isobutylene)

APPENDIX IV

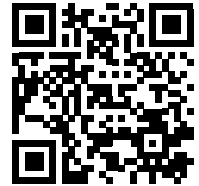
Waste Classification Report



Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



Y1019-10DN7-GCRB0

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in **pale yellow**.

Report is invalid if pages are removed.

Job name

Millbrook Hospital

Description/Comments

Project

24-586

Site

Millbrook Hospital

Classified by

Name:
Phillip Brown

Date:
11 Apr 2025 11:38 GMT

Telephone:
0191 378 6380

Company:
Arc Environmental Ltd
Solum House, Unit 1 Elliott Court, St John's
Road
Meadowfield
Durham City
DH7 8PN

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

-

Course

Hazardous Waste Classification

Date

-

Purpose of classification

2 - Material Characterisation

Address of the waste

Wastdale Road, Manchester

Post Code M23 2RX

SIC for the process giving rise to the waste

41201 Construction of commercial buildings

Description of industry/producer giving rise to the waste

Construction & Demolition - extension of existing hospital development

Description of the specific process, sub-process and/or activity that created the waste

Arisings from foundation and service excavations

Description of the waste

Made ground including clayey soil with brick and rootlets, sandy clay with occasional brick, ash and sandstone and sandy gravel.



Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS01-06/03/2025-0.4	0.4	Non Hazardous		3
2	WS01-06/03/2025-0.9	0.9	Non Hazardous		6
3	WS03-06/03/2025-0.4	0.4	Non Hazardous		9
4	WS04-06/03/2025-0.3	0.3	Non Hazardous		12

Related documents

#	Name	Description
1	HWOL_25-08226-20250323 122946.hwol	Eurofins Chemtest .hwol file used to populate the Job
2	Arc 2021 with acid alkali reserve	waste stream template used to create this Job

Report

Created by: Phillip Brown

Created date: 11 Apr 2025 11:38 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	15
Appendix B: Rationale for selection of metal species	16
Appendix C: Version	17

Classification of sample: WS01-06/03/2025-0.4

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS01-06/03/2025-0.4	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.4 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
14%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 14% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number								
1		arsenic { arsenic trioxide }				9.9 mg/kg	1.32	11.241 mg/kg	0.00112 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
2		cadmium { cadmium oxide }				<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD	
		048-002-00-0	215-146-2	1306-19-0								
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				26 mg/kg	1.462	32.68 mg/kg	0.00327 %	✓		
			215-160-9	1308-38-9								
4		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD	
		024-001-00-0	215-607-8	1333-82-0								
5		copper { dicopper oxide; copper (I) oxide }				29 mg/kg	1.126	28.08 mg/kg	0.00281 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
6		lead { lead chromate }			1	33 mg/kg	1.56	44.268 mg/kg	0.00284 %	✓		
		082-004-00-2	231-846-0	7758-97-6								
7		mercury { mercury dichloride }				0.1 mg/kg	1.353	0.116 mg/kg	0.0000116 %	✓		
		080-010-00-X	231-299-8	7487-94-7								
8		nickel { nickel chromate }				27 mg/kg	2.976	69.109 mg/kg	0.00691 %	✓		
		028-035-00-7	238-766-5	14721-18-7								
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.56 mg/kg	1.405	0.677 mg/kg	0.0000677 %	✓		
		034-002-00-8										
10		zinc { zinc chromate }				54 mg/kg	2.774	128.831 mg/kg	0.0129 %	✓		
		024-007-00-3	236-878-9	13530-65-9								
11		pH				7.8 pH		7.8 pH	7.8 pH			
				PH								
12		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD	
		006-007-00-5										
13		acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD	
			201-469-6	83-32-9								
14		acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD	
			205-917-1	208-96-8								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
15	anthracene	204-371-1	120-12-7		0.26 mg/kg		0.224 mg/kg	0.0000224 %	✓	
16	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
17	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
18	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
19	benzo[ghi]perylene	205-883-8	191-24-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
20	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
21	chrysene	601-048-00-0	205-923-4	218-01-9	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
23	fluoranthene	205-912-4	206-44-0		1.1 mg/kg		0.946 mg/kg	0.0000946 %	✓	
24	fluorene	201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
25	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
26	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
27	phenanthrene	201-581-5	85-01-8		1.1 mg/kg		0.946 mg/kg	0.0000946 %	✓	
28	pyrene	204-927-3	129-00-0		1 mg/kg		0.86 mg/kg	0.000086 %	✓	
29	benzene	601-020-00-8	200-753-7	71-43-2	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
30	toluene	601-021-00-3	203-625-9	108-88-3	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
31	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
32	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
33	TPH (C6 to C40) petroleum group		TPH		24 mg/kg		20.64 mg/kg	0.00206 %	✓	
34	confirm TPH has NOT arisen from diesel or petrol				☑					
35	asbestos	650-013-00-6	----- 12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
Total:								0.0323 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 1000 mg/kg (0.1%)
because: No liquid phase. Too low to be flammable.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.00206%)

Classification of sample: WS01-06/03/2025-0.9

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS01-06/03/2025-0.9	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.9 m	
Moisture content:	
9.6%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 9.6% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				8.3 mg/kg	1.32	9.907 mg/kg	0.000991 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				0.49 mg/kg	1.142	0.506 mg/kg	0.0000506 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				16 mg/kg	1.462	21.14 mg/kg	0.00211 %	✓	
		215-160-9	1308-38-9							
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
5	copper { dicopper oxide; copper (I) oxide }				21 mg/kg	1.126	21.374 mg/kg	0.00214 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	lead { lead chromate }			1	36 mg/kg	1.56	50.763 mg/kg	0.00325 %	✓	
	082-004-00-2	231-846-0	7758-97-6							
7	mercury { mercury dichloride }				0.12 mg/kg	1.353	0.147 mg/kg	0.0000147 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
8	nickel { nickel chromate }				19 mg/kg	2.976	51.12 mg/kg	0.00511 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.58 mg/kg	1.405	0.737 mg/kg	0.0000737 %	✓	
	034-002-00-8									
10	zinc { zinc chromate }				57 mg/kg	2.774	142.946 mg/kg	0.0143 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
11	pH		PH		7.8 pH		7.8 pH	7.8 pH		
12	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
	006-007-00-5									
13	acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-469-6	83-32-9							
14	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-917-1	208-96-8							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
15	anthracene	204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
16	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
17	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
18	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
19	benzo[ghi]perylene		205-883-8	191-24-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
20	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
21	chrysene	601-048-00-0	205-923-4	218-01-9	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
23	fluoranthene		205-912-4	206-44-0	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
24	fluorene		201-695-5	86-73-7	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
25	indeno[123-cd]pyrene		205-893-2	193-39-5	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
26	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
27	phenanthrene		201-581-5	85-01-8	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
28	pyrene		204-927-3	129-00-0	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
29	benzene	601-020-00-8	200-753-7	71-43-2	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
30	toluene	601-021-00-3	203-625-9	108-88-3	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
31	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
32	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
33	TPH (C6 to C40) petroleum group			TPH	29 mg/kg		26.216 mg/kg	0.00262 %	✓		
34	confirm TPH has NOT arisen from diesel or petrol				☒						
35	asbestos	650-013-00-6	-----	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5	<10 mg/kg		<10 mg/kg	<0.001 %			<LOD
Total:									0.0307 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 1000 mg/kg (0.1%)
because: No liquid phase. Too low to be flammable.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.00262%)

Classification of sample: WS03-06/03/2025-0.4

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS03-06/03/2025-0.4	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.4 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
9.5%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 9.5% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number								
1		arsenic { arsenic trioxide }				7.6 mg/kg	1.32	9.081 mg/kg	0.000908 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
2		cadmium { cadmium oxide }				1.1 mg/kg	1.142	1.137 mg/kg	0.000114 %	✓		
		048-002-00-0	215-146-2	1306-19-0								
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17 mg/kg	1.462	22.486 mg/kg	0.00225 %	✓		
			215-160-9	1308-38-9								
4		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD	
		024-001-00-0	215-607-8	1333-82-0								
5		copper { dicopper oxide; copper (I) oxide }				21 mg/kg	1.126	21.398 mg/kg	0.00214 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
6		lead { lead chromate }			1	39 mg/kg	1.56	55.054 mg/kg	0.00353 %	✓		
		082-004-00-2	231-846-0	7758-97-6								
7		mercury { mercury dichloride }				0.1 mg/kg	1.353	0.122 mg/kg	0.0000122 %	✓		
		080-010-00-X	231-299-8	7487-94-7								
8		nickel { nickel chromate }				17 mg/kg	2.976	45.79 mg/kg	0.00458 %	✓		
		028-035-00-7	238-766-5	14721-18-7								
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.36 mg/kg	1.405	0.458 mg/kg	0.0000458 %	✓		
		034-002-00-8										
10		zinc { zinc chromate }				59 mg/kg	2.774	148.126 mg/kg	0.0148 %	✓		
		024-007-00-3	236-878-9	13530-65-9								
11		pH				7.9 pH		7.9 pH	7.9 pH			
				PH								
12		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD	
		006-007-00-5										
13		acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD	
			201-469-6	83-32-9								
14		acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD	
			205-917-1	208-96-8								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
15	anthracene	204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
16	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
17	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
18	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
19	benzo[ghi]perylene	205-883-8	191-24-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
20	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
21	chrysene	601-048-00-0	205-923-4	218-01-9	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
23	fluoranthene	205-912-4	206-44-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
24	fluorene	201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
25	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
26	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
27	phenanthrene	201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
28	pyrene	204-927-3	129-00-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
29	benzene	601-020-00-8	200-753-7	71-43-2	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
30	toluene	601-021-00-3	203-625-9	108-88-3	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
31	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
32	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
33	TPH (C6 to C40) petroleum group		TPH		42 mg/kg		38.01 mg/kg	0.0038 %	✓		
34	confirm TPH has NOT arisen from diesel or petrol				☒						
35	asbestos	650-013-00-6	----- 12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<10 mg/kg		<10 mg/kg	<0.001 %			<LOD
Total:									0.0322 %		

Key	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 1000 mg/kg (0.1%)
because: No liquid phase. Too low to be flammable.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0038%)

Classification of sample: WS04-06/03/2025-0.3

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS04-06/03/2025-0.3	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m	
Moisture content:	
15%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 15% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number								
1		arsenic { arsenic trioxide }				19 mg/kg	1.32	21.323 mg/kg	0.00213 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
2		cadmium { cadmium oxide }				0.41 mg/kg	1.142	0.398 mg/kg	0.0000398 %	✓		
		048-002-00-0	215-146-2	1306-19-0								
3		chromium in chromium(III) compounds {  chromium(III) oxide (worst case) }				28 mg/kg	1.462	34.785 mg/kg	0.00348 %	✓		
			215-160-9	1308-38-9								
4		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD	
		024-001-00-0	215-607-8	1333-82-0								
5		copper { dicopper oxide ; copper (I) oxide }				59 mg/kg	1.126	56.463 mg/kg	0.00565 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
6		lead { lead chromate }			1	110 mg/kg	1.56	145.843 mg/kg	0.00935 %	✓		
		082-004-00-2	231-846-0	7758-97-6								
7		mercury { mercury dichloride }				0.39 mg/kg	1.353	0.449 mg/kg	0.0000449 %	✓		
		080-010-00-X	231-299-8	7487-94-7								
8		nickel { nickel chromate }				26 mg/kg	2.976	65.775 mg/kg	0.00658 %	✓		
		028-035-00-7	238-766-5	14721-18-7								
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.81 mg/kg	1.405	0.967 mg/kg	0.0000967 %	✓		
		034-002-00-8										
10		zinc { zinc chromate }				120 mg/kg	2.774	282.963 mg/kg	0.0283 %	✓		
		024-007-00-3	236-878-9	13530-65-9								
11		pH				7.5 pH		7.5 pH	7.5 pH			
				PH								
12		cyanides {  salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD	
		006-007-00-5										
13		acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD	
			201-469-6	83-32-9								
14		acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD	
			205-917-1	208-96-8								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
15	anthracene	204-371-1	120-12-7		0.22 mg/kg		0.187 mg/kg	0.0000187 %	✓	
16	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.61 mg/kg		0.519 mg/kg	0.0000519 %	✓	
17	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
18	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
19	benzo[ghi]perylene		205-883-8	191-24-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
20	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
21	chrysene	601-048-00-0	205-923-4	218-01-9	0.6 mg/kg		0.51 mg/kg	0.000051 %	✓	
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
23	fluoranthene		205-912-4	206-44-0	1.4 mg/kg		1.19 mg/kg	0.000119 %	✓	
24	fluorene		201-695-5	86-73-7	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
25	indeno[123-cd]pyrene		205-893-2	193-39-5	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
26	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
27	phenanthrene		201-581-5	85-01-8	0.76 mg/kg		0.646 mg/kg	0.0000646 %	✓	
28	pyrene		204-927-3	129-00-0	1.3 mg/kg		1.105 mg/kg	0.000111 %	✓	
29	benzene	601-020-00-8	200-753-7	71-43-2	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
30	toluene	601-021-00-3	203-625-9	108-88-3	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
31	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
32	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
33	TPH (C6 to C40) petroleum group		TPH		65 mg/kg		55.25 mg/kg	0.00553 %	✓	
34	confirm TPH has NOT arisen from diesel or petrol				☒					
35	asbestos	650-013-00-6	----- 12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
Total:								0.0616 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 1000 mg/kg (0.1%)
because: No liquid phase. Too low to be flammable.

Hazard Statements hit:

Fam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.00553%)

Appendix A: Classifier defined and non GB MCL determinands

• **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **pH** (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

• **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

GB MCL index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s):

20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

• **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

• **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

• **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23 Jul 2015

Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2; H351

■ **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Carc. 2; H351, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Skin Irrit. 2; H315

■ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Skin Irrit. 2; H315, Eye Irrit. 2; H319, STOT SE 3; H335, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

■ **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4

Description/Comments:

Additional Hazard Statement(s): Carc. 2; H351

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

■ **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3; H226, Asp. Tox. 1; H304, STOT RE 2; H373, Muta. 1B; H340, Carc. 1B; H350, Repr. 2; H361d, Aquatic Chronic 2; H411

■ **confirm TPH has NOT arisen from diesel or petrol**

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worst case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)



selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**

HazWasteOnline Classification Engine Version: 2025.100.6561.11933 (10 Apr 2025)

HazWasteOnline Database: 2025.100.6561.11933 (10 Apr 2025)

This classification utilises the following guidance and legislation:

WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020

GB MCL List - version 1.1 of 09 June 2021

GB MCL List v2.0 - version 2.0 of 20th October 2023

GB MCL List v3.0 - version 3.0 of 11th January 2024

GB MCL List v4.0 - version 4.0 of 2nd March 2024

GB MCL List v5.0 - version 5.0 of 26th June 2024

GB MCL List v6.0 - version 6.0 of 15th February 2025