

WHALLEY ROAD RAMSBOTTOM

FINAL PHASE 2 GEO-ENVIRONMENTAL INVESTIGATION, RISK ASSESSMENT AND REMEDIATION STRATEGY

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Prepared By	Ella Mcleod Assunta Trapanese Emma Khadun	Reviewed By	Colin Wardle Kris Rodway

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EXECUTIVE SUMMARY

Site Details

Site Location:	Western side of Whalley road between Love Lane and the Duckworth Arms. Centred at approximate National Grid Reference 380010E 418180N.
Site Area:	1680m ² .
Current Land Use:	Tarmacadam and compacted gravel area currently used for residential parking and domestic garages. South western area comprises an area of rough vegetation.
Proposed Development:	Two semi-detached houses with soft landscaping in back gardens, with hardwood driveway, associated car parking and minimal soft landscaping (planning ref. 68608). A planning application has not yet been submitted for the area in the south west of site however LKC understand that the development will comprise a detached dwelling.
Purpose of Report:	Contamination and Geotechnical Assessment.

Preliminary Risk Assessment

PRA Details:	Onsite: 2no. Refuse Tips, Unnamed Structures, Domestic Garages. Surrounding Area: Refuse Tip, Issues, Sinks, Unnamed water courses, embankments, Ponds, Quarry.
History:	Artificial: No BGS recorded artificial. Superficial: Till (Devensian). Secondary Undifferentiated Aquifer. Bedrock: Marsden Formation (mudstone, siltstone), Secondary A Aquifer.
Geology / Hydrogeology:	No recorded landfills. Potentially infilled ground identified on site (historic refuse tip).
Mining:	North eastern area of site is hardwood (tarmacadam and compacted gravel) with some areas of grass/weeds growing through the gravel. 6no. domestic garages currently on site in differing conditions, potential for ACMs. South western part of site comprises an area of rough vegetation. Site surrounded by roads, fields and residential properties.
Relevant Environmental Setting:	Onsite: 2no. Refuse Tips, Unnamed Structures, Domestic Garages. Surrounding Area: Refuse Tip, Issues, Sinks, Unnamed water courses, embankments, Ponds, Quarry.
Preliminary Conceptual Model: PL=Pollutant Linkage	PL1 Direct Contact (Human Health): Moderate Risk (metals, PAHs, asbestos), Moderate / Low Risk (Petroleum Hydrocarbons). PL2 Inhalation of Vapours: Moderate Risk (volatile contaminants). PL3 Gas: High Risk (hazardous gas). Low Risk (radon). PL4 Controlled waters: Moderate / Low Risk (mobile contaminants). PL5 Water Pipelines: Moderate Risk (organic contaminants).
Recommendations:	Site Investigation was recommended to further assess all the above pollutant linkages.

Ground Investigation Work Undertaken

Date of Investigation:	2 nd March 2023.
Intrusive Investigation Work Undertaken:	5no. window sample boreholes drilled to 2.70-5.30mbgl (ref. WS101 to WS105). 3no. Dynamic Probes, drilled to 2.85-6.44mbgl (ref. DP101-DP103) with window sample overcore (WS102, WS103 and WS104 respectively). 1no. hand dug pit (using hand auger / spade) excavated to 0.60mbgl (ref. HD101).
Monitoring Wells:	Installed in all boreholes.
Soil Sampling:	7no. samples tested for metals, speciated PAHs, pH, sulphate, asbestos and SOM. 1no. sample tested for metals, speciated PAHs, TPHCWG, pH, sulphate, asbestos, SOM and Waste Acceptance Criteria. 3no. samples tested for metals, speciated PAHs, cyanide, pH, sulphate, asbestos, phenol, TPHCWG, BTEX, VOCs, SVOCs and SOM. 2no. samples tested for TICs SVOCs and TICs VOCs.

Groundwater Sampling:	3no. samples tested for metals, speciated PAHs, cyanide, pH, sulphate, asbestos, phenol, TPHCWG, BTEX, VOCs, SVOCs and SOM.
Monitoring:	6no. gas monitoring visits over 3 months.
In situ and Laboratory Geotechnical Testing:	SPTs, DP's, shear vanes, plasticity.

Ground Conditions and Geotechnical Assessment

Location	General Ground conditions	Allowable Bearing Pressure	Anticipated Foundation Type	Other Considerations
Whole Site	Made Ground to approx. 0.80mbgl on the eastern area and >4.00mbgl on the western area. Firm to stiff CLAY to 1.95-5.20mbgl. Dense SAND to 3.00mbgl at WS101. Weathered Sandstone from 2.60-5.20mbgl. Groundwater from 0.66mbgl.	60kN/m ² for strip foundation at 1.00mbgl within the natural CLAY in the eastern sector of the site.	Mini-pile foundations in the eastern area of the site. Pile foundation or ground improvement in the western area of the site.	Consideration of effects of trees also needs to be considered. Temporary supports of excavations may be required. Detailed design should be carried out by structural engineer. Concrete Requirements DS-2 AC-2 for the Made Ground and DS-1 AC-1 for natural strata.

Contamination Risk Assessment

The table below shows a summary of the risk assessments undertaken for each pollutant linkage, the revised conceptual model and recommendation for either remediation and / or further investigation.

Pollutant Linkage	Risk	Recommendations
1 Contaminants posing a risk to future site users and offsite receptors via dermal contact, ingestion and inhalation (of soil, dust, fibres and home-grown produce).	Moderate (ACM, metals)	- Remediation recommended garden / soft landscaping areas.
	Moderate (hydrocarbons/ VOCs/ SVOCs – localised)	- Further site work to delineate and remove impacted material.
	Moderate / Low (PAHs)	- No specific remediation recommended. Remediation associated with metals / ACM will mitigate any risk.
	Low (hydrocarbons/ VOCs/ SVOCs)	- No remediation recommended.
2 Volatile contaminants posing a risk to future site users and offsite receptors via the inhalation of vapours.	Moderate / Low (localised)	- Further site work to delineate and remove impacted material as part of PL1.
	Low (remainder of site)	- No remediation recommended.

Pollutant Linkage		Risk	Recommendations
3	Gas posing a risk to buildings, future site users and offsite land users via the migration of gas into building causing explosion and asphyxiation.	Moderate / Low (methane, carbon dioxide)	-Site classified as CS1 / NHBC green. No remediation recommended.
		Low (radon)	-No radon protection measures recommended.
4	Mobile contamination posing a risk to controlled waters via the migration through permeable strata.	Low	-No remediation recommended.
5	Organic contaminants posing a risk to water pipes.	Low	-Barrier piping unlikely to be recommended. However, this will need to be confirmed once UU risk assessment undertaken.

Recommendations and Remedial Strategy

The table below shows the remediation and validation requirements for the site. This information should be documented in a Site Completion Report for submission to the local authority.

Phase	PL	Remediation Requirements	Validation Requirements
Pre-Construction	ALL	<u>Earthworks Inspections / Unexpected Contamination</u> The relevant contractors should be briefed that during development works at the site should any unusual ground conditions and / or visual or olfactory evidence of contamination (including asbestos containing material) be encountered at the site, LKC and the Local Authority should be informed, and further assessment of the material may be required.	Log of work undertaken including photographs. Details of any sampling undertaken and validation of any potential additional remedial work.
	1, 2	<u>Hydrocarbon Hotspot Removal Areas</u> Impacted soils at locations WS101 and WS104 (based on visual / olfactory evidence and the use of a PID) should be excavated and removed. Impacted soils should be placed on an impermeable surface to await removal from site (this may be subject to chemical testing to confirm suitable waste facility). The work should be done under the supervision and instruction of an environmental consultant. If all impacted ground cannot be removed and contamination remains on the ground, further remediation may need to be considered.	Details of work undertaken including photographs. Confirmatory samples of the remaining in-situ soils. Consignment notes confirming the removal of impacted soil.

Phase	PL	Remediation Requirements	Validation Requirements
Build-Phase Construction	1	<u>Environmental Cover System</u> As made ground is relatively deep, it is unlikely to be viable to remove the contaminated soils. Therefore, an environmental cover system is recommended. The environmental cover system should be as follows: Private Back Gardens: 600mm thick environmental cover system comprising: 100mm physical break layer (MOT type 1 material, 20-30mm, minimal fines) and at least 500mm comprising clean inert fill and sufficient topsoil for a growing medium. Private Front Garden / Shared Landscaping: 300mm thick environmental cover system comprising: 100mm physical break layer (MOT type 1 material, 20-30mm, minimal fines) and at least 200mm comprising clean inert fill and sufficient topsoil for a growing medium. The subsoil layer can be replaced by additional topsoil. A diagram of a typical environmental cover system is shown in Appendix K. Areas of TPO's Please note where there are TPO's in influencing distance of the gardens it is likely the arboriculture officer may only allow a 100mm clean cover system over a geotextile membrane.	Measuring depth of environmental cover system using a staff and providing photographic evidence. Photographic evidence of the granular physical break or geotextile layer will also be collected. Chemical validation of imported soils: See Table 9-2.
	3, 4	No remediation recommended for PL3 (gas) and PL4 (controlled waters).	N/A.
Other Considerations		<u>Grubbing Out of In-Ground Structures</u> It is recommended that in-ground structures are grubbed out as part of the groundworks. <u>Re-use of site won material</u> To ensure material is compliant with appropriate waste regulations, any site won material re-used onsite should be in recourse to appropriate exemptions. A U1 and T5 exemption should be registered. This will allow the following to be used onsite or brought in for use onsite (refer to guidance for types of waste that can be used ¹): 5,000 tonnes (c. 2,500m³) <u>treatment</u> of crushed concrete / stone. 1,000 tonnes (c. 500³) <u>use of</u> non-hazardous soil 5,000 tonnes (c. 2,500m³) <u>use of</u> clays, sand, gravel, brick, concrete, stone etc. 50,000 tonnes (c. 25,000m³) <u>use of</u> bituminous material to be used in roadways. A Materials Management Plan (MMP) with recourse to the CL:AIRE Code of Practice may be required if volumes exceed exemption limits. This must be registered before material movement starts onsite.	

¹ <https://www.gov.uk/guidance/waste-exemptions-using-waste>

	If an MMP is required, this needs to be registered by a Qualified Person (QP) and there must be 'certainty of use' for any material re-used onsite or exported to site to ensure there is no 'sham recovery'. For all the above material will need to be tested at the rate and analytical suites presented in Table 9-2.										
Other Considerations	Asbestos Management Plan Due to the presence of asbestos containing material, it is recommended that additional precautions are taken during site clearance, earthworks and construction in the area of concern. The presence of asbestos in the made ground at the site presents a potential risk of generation of airborne fibres if this material is disturbed, such as for excavations to construct new foundations. This risk can be managed by careful procedures and site monitoring to reduce the risk of airborne fibres, and it is recommended that an appropriate 'Asbestos Management Strategy' is developed and adopted for all intrusive ground works which disturb the made ground in the area of concern. This should be carried out in line with CIRIA C733². This may include asbestos awareness training for all site staff, provision of suitable personal and respiratory protective equipment and air monitoring. With regards to cement bound asbestos, this can be handpicked, doubled bagged and disposed of appropriately to a licenced landfill. Guidance on removing asbestos cement is described in HSE (2012)³. If ACM is identified in soil arisings then soil should be placed directly into covered skips and disposed of at a suitable licenced landfill, after further testing to quantify the extent of asbestos contamination of the soils. It should be considered that blue asbestos is notifiable and must be removed by a licenced contractor. LKC have utilised the Joint Industry Working Group (JWIG) tool for risk during earthworks. The output is presented below and included in Appendix I. <table> <tr> <td colspan="2">Stage 3 Risk Assessment Outputs</td></tr> <tr> <td>Probable Licensing Status</td><td>CAR do not apply</td></tr> <tr> <td>RPE*</td><td>None</td></tr> <tr> <td>Dust Suppression**</td><td>None</td></tr> <tr> <td>Hygiene/Decontamination***</td><td>None</td></tr> </table> *Where RPE has to be worn continuously for long periods (e.g. more than 1-hour), then powered RPE may be necessary. **Reduction in control measures possible if natural mitigation factors are present (e.g. raining, wet ground) ***Guide only; suitability of selected personal hygiene measures may be reviewed on a site/contamination-specific basis Health and Safety Considerations In working with, removing or treating any contaminating material it is important that any potential risks associated with the actual site works are mitigated by good environmental management of the site during the remedial phases. Standard health and safety precautions (as per HSE guidance⁴) should be adopted by all workers involved with site enabling and construction works.	Stage 3 Risk Assessment Outputs		Probable Licensing Status	CAR do not apply	RPE*	None	Dust Suppression**	None	Hygiene/Decontamination***	None
Stage 3 Risk Assessment Outputs											
Probable Licensing Status	CAR do not apply										
RPE*	None										
Dust Suppression**	None										
Hygiene/Decontamination***	None										
Other Considerations	Piling in Contaminated Land It is understood that the building will be piled into the bedrock. This may provide a preferential pathway for contaminants to the Secondary A Aquifer. Once the method of										

² CIRIA (2014). "Asbestos in Soil and Made Ground: A Guide to Understanding and Managing Risks". C733.

³ HSE (2012). "Removing Asbestos Cement (AC) Debris)." A11 Asbestos Essential – Non-licenced Tasks.

⁴ HSE (1991). "Protection of Workers and the General Public During Development of Contaminated Land" London HMSO.

	piling has been determined, good practice for the drilling of piles on contaminated sites should be adhered to, such as guidance provided by the Environment Agency ⁵ .
	<u>Asbestos Survey</u> A Pre-Demolition and Major Refurbishment Asbestos Survey should be undertaken, and any ACMs removed and properly disposed of, prior to the demolition of the existing buildings, by a suitably qualified professional.

The remediation recommended in the table above should be validated to ensure it has been carried out appropriately. This should be documented in a Completion / Validation Report and submitted to the local authority.

⁵Environment Agency (2001) Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention.

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APPENDICES

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Appendix C:	Profile Logs / DP Logs
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Appendix K:	HazWasteOnline Output Sheets
Appendix L:	Typical Environmental Cover System

1 Introduction

1.1 Background

LK Consult Ltd (LKC) has been commissioned by Steven Mort to carry out a Phase 2 Geo-Environmental Investigation, Risk Assessment and Remediation Strategy for Whalley Road, Ramsbottom. The investigation was undertaken in support of a planning application (ref. 68608) to develop the site for residential use.

The following work has previously been undertaken:

- Preliminary Risk Assessment (PRA) report, undertaken by LKC (Ref: CL-602-LKC 21 1680-01, dated November 2021).

This investigation has been undertaken to confirm the ground conditions below the site and to allow a contamination and geotechnical assessment to be undertaken.

The investigation will aim to confirm the risks of the potential pollutant linkages identified in the PRA and recommend further assessment / remediation, as required.

Since writing the PRA, the site boundary has been extended to include the triangular grassed area of land immediately to the west. LKC understand that the client plans to submit a revised planning application for an additional detached dwelling within the area of land in the west and LKC undertook site investigation work within this area.

This is an interim report including all investigation work completed to date. A final report will be issued on completion of groundwater sampling and gas monitoring.

1.2 Site Details

A summary of the site details is presented in Table 1-1. Figures 1 indicates the site location and boundary. Figure 2 indicates the proposed development.

Site Location	Western side of Whalley road between Love Lane and the Duckworth Arms. Centred at approximate National Grid Reference 380010E 418180N.
Approximate Area	1680m ² .
Topography	180 metres Above Ordnance Datum (AOD). Site slopes gently down to the south west. Track is situated at a lower level to the vegetated area in the south west of site.
Current Site Use	Tarmacadam and compacted gravel area currently used for residential parking and domestic garages. South western area comprises an area of rough vegetation.
Purpose of Report	Pre-planning.
Proposed Development	Two semi-detached houses with soft landscaping in back gardens, with hardstood driveway, associated car parking and minimal soft landscaping (planning ref. 68608). A planning application has not yet been submitted for the area in the south west of site however LKC understand that the development will comprise a detached dwelling.

Table 1-1. Summary of site details.

2 Review of Previous Work

2.1 Phase 1 Preliminary Risk Assessment (PRA)

A PRA report (Ref: CL-602-LKC 21 1680-01, dated November 2021) has previously been undertaken by LKC.

Table 2-1 summarises the site details, historical review, environmental settings and site reconnaissance.

Main Historical Features	Onsite: 2no. Refuse Tips, Unnamed Structures, Domestic Garages. Surrounding Area: Refuse Tip, Issues, Sinks, Unnamed water courses, embankments, Ponds, Quarry.
Geology / Hydrogeology	Artificial: No BGS recorded artificial. Superficial: Till (Devensian). Secondary Undifferentiated Aquifer. Bedrock: Marsden Formation (mudstone, siltstone), Secondary A Aquifer. Unnamed surface water course – 38m S.
Landfills / Infilled ground	No recorded landfills. Potentially infilled ground identified on site (historic refuse tip).
Site walkover	North eastern area of site is hardstood (tarmacadam and compacted gravel) with some areas of grass/weeds growing through the gravel. 6no. domestic garages currently on site in differing conditions, potential for ACMs. South western part of site comprises an area of rough vegetation. Site surrounded by roads, fields and residential properties.

Table 2-1: Summary of site details, historical review, environmental settings and site reconnaissance.

The preliminary contamination conceptual model (PCCM) produced in the PRA is provided in Table 2-2.

Each pollutant linkage is described along with an assessment of the risk based upon guidance on probabilities and consequences outlined in CIRIA C552⁶. The risk matrix is provided in Appendix A.

Version R1 of the report includes an updated radon assessment. A BGS GeoReport has been purchased and is included in Appendix B.

The PCCM has been updated to take into account recent LKC changes to omit phytotoxicity, sulphate and potable water pipes pollutant linkages. Justification is provided below.

Due to the minor consequence associated with the phytotoxic effect to flora (i.e. loss of plants in a landscaping scheme), the overall risk for the majority of sites will be very low to low. Where soils contain significant concentrations of heavy metals, in general there will other pollutant linkages (i.e. the risk to human health) that will trigger the requirement for remediation (e.g. a clean environmental cover system). As such the risk to flora associated with phytotoxic contaminants will not be considered further.

The risk to buildings associated with elevated sulphate will be considered as part of the geotechnical assessment and will not be included in the contamination risk assessment.

⁶ CIRIA (2001). "Contaminated Land Risk Assessment: A Guide to Good Practice". C552.

PL	Pathway	Receptor	Contaminants of Concern (CoC)	Probability	Consequence	Risk	Recommendations
1	- Dermal contact. - Inhalation of soil, fibres and dust. - Ingestion of soils, dust. - Windblown dust.	- Future site users. - Offsite receptors.	- ACM. - Heavy metals. - PAHs. - Other inorganic and organic contaminants including ammonia.	Likely (given site history, site conditions and proposed end use)	Medium	Moderate	Intrusive investigation required. Soil analysis of CoC, subject to ground conditions encountered.
			- Petroleum hydrocarbons (TPHCWG).	Low Likelihood (given site history, potential pathway through gravel and proposed end use)	Medium	Moderate / Low (low assumed as significant source not anticipated)	Low density intrusive investigation required. Soil analysis of CoC, subject to ground conditions encountered.
2	- Inhalation of vapours. - Migration via permeable strata and preferential pathways.	- Future site users. - Offsite receptors.	- Volatile contaminants (SVOC, VOCs).	Likely (given site history, site conditions and proposed end use)	Medium	Moderate	Intrusive investigation required, to include PID testing. Soil analysis of CoC, subject to ground conditions encountered and PID testing. VOC/ SVOC monitoring may be required, dependent on soil testing results.
3	- Inhalation of gas. - Migration via permeable strata and preferential pathways. - Explosion in confined spaces. - Exposure to radon.	- Future site users. - Buildings. - Offsite land users.	- Ground / hazardous gas (carbon dioxide, methane, hydrogen sulphide-onsite and adjacent refuse tip).	Likely (given viable gas source and viable pathway)	Severe	High	Gas monitoring required.
			- Radon	Unlikely (as <1% of homes above action level)	Medium	Low	(<1%) No protective measures are necessary in the construction of new dwellings or extensions.
4	- Surface run-off. - Migration via permeable strata and preferential pathways. - Perched waters migration.	- Groundwater (Secondary A Bedrock and Secondary Undifferentiated Superficial Aquifers.). - Surface water (unnamed water course).	- Mobile contaminants such as metals, PAHs, hydrocarbons, volatile compounds from leachates.	Low Likelihood (mobile contamination anticipated, however limited pathway)	Medium	Moderate / Low (moderate assumed until ground conditions confirmed)	Intrusive investigation required. Groundwater sampling, subject to ground conditions encountered. Surface water not considered to be a significant receptor.
5	- Sulphate attack on concrete.	- Building structure.	- Sulphate.	Likely (given site history, site conditions, geology and direct contact / pathway)	Mild	Moderate / Low (moderate assumed due to on site refuse tip)	Intrusive investigation required. Soil analysis of CoC, subject to ground conditions encountered.

Table 2-2. Preliminary Contamination Conceptual Model.

3 Ground Investigation

3.1 Site Investigation Design and Methodology

In order to assess the ground conditions at the site and to investigate the potential pollutant linkages identified in the preliminary contamination conceptual model an intrusive investigation was undertaken.

The investigation was carried out on 2nd March 2023 and comprised the following:

- 5no. window sample boreholes drilled to 2.70-5.30 metres below ground level (mbgl) (ref. WS101 to WS105).
- 3no. Dynamic Probes, drilled to 2.85-6.44mbgl (ref. DP101-DP103) with window sample overcore (WS102, WS103 and WS104 respectively).
- 1no. hand dug pit (using hand auger / spade) excavated to 0.60mbgl (ref. HD101).

Dynamic probes were undertaken from the surface at locations WS102, WS103 and WS104 instead of Standard Penetration Tests (SPTs) as granular strata was anticipated. Window sample boreholes WS102, WS103 and WS104 were drilled overcore.

A hand dug pit was undertaken in the south western area of site, as this area was inaccessible with the window sample rig.

All site investigation locations are shown in Figure 3.

The locations were chosen to allow good coverage across the site as well as target areas of concern. Table 3-1 details the targeted and general coverage (non-targeted) site investigation locations.

Site Investigation Locations	Rationale
HD101, WS101, WS104, WS105	Within area of refuse tip and general site coverage.
WS102, WS103	General site coverage and close to domestic garages.

Table 3-1: Summary of sampling locations.

The number of site investigation points corresponds to approximately one location per 17m square centres. This is considered to be a conservative sampling density and is in line with BS10175⁷ for a 'main investigation'.

All profile logs are provided in Appendix C and are in line with BS14688-1⁸ and BS5930⁹.

3.2 Well Installations

All of the boreholes were installed with monitoring wells for gas and groundwater monitoring and groundwater sampling. Monitoring wells were installed in accordance with BS10175 and CIRIA C665¹⁰ and generally comprised approximately 1m plain pipe

⁷ British Standard (2017). "Investigation of Potentially Contaminated Sites – Code of Practice." BS10175:2017.

⁸ British Standards (2002) Geotechnical investigation and testing – Identification and Classification of Soil. Part 1: Identification and description. BS EN ISO 14688-1:2002.

⁹ British Standard (2015). "Code of Practice for Ground Investigations". BS5930:2015.

¹⁰ CIRIA (2007). "Assessing Risks Posed by Hazardous Ground Gases to Buildings." CIRIA C665.

over a length of slotted pipe surrounded by pea gravel and sealed at the top with bentonite and concrete.

The response zone for WS101 was installed between 1.00-3.00mbgl within the natural superficial strata. The response zones for WS102 and WS103 were installed between 0.50-1.00mbgl and 1.00-3.00mbgl, respectively, within the made ground strata. The response zone for WS104 was installed between 3.00-4.00mbgl to target the made ground strata with a slight hydrocarbon odour and groundwater. The response zone for WS105 was installed between 1.00-4.00mbgl within the made ground strata.

Well installation details are provided in Profile Logs in Appendix C.

3.3 Sampling Protocol

3.3.1 Soil Sampling (Contamination)

Standard sampling protocol and preservation of samples was undertaken as described in the EA guidance on site investigation¹¹.

Soil was collected for onsite testing. A plastic zip bag was half filled with soil allowing a suitably sized headspace. The bag was sealed and stored for at least 20 minutes before being tested for total volatile organic compounds (TVOCs) using a PhoCheck Tiger photoionisation detector (PID). Results of the PID readings are presented on the profile logs (Appendix C). The on-site monitoring was carried out in line CIRIA C665¹² to aid in screening samples for volatile analysis.

Soil samples of approximately 500g were recovered in amber jars, amber vials for volatile analysis and plastic tubs. All the samples were labelled and stored in cool boxes prior to being collected by courier at the end of the day for delivery to the DETSt laboratory in Newmarket for chemical testing. If collection was not possible the same day then samples were stored in the sample storage fridge at the LK Group offices below 4°C. Samples were tracked using appropriate Chain of Custody forms provided by Chemtest.

Many of the contamination tests are UKAS or MCERTS accredited and further details are given in the Certificate of Analysis presented in Appendix D. Table 3-2 shows the soil testing undertaken.

¹¹ EA (2000). "Technical Aspects of Site Investigation. Volumes 1 & 2 Text Supplements Research and Development Technical Report." P5-065/Tr.

¹² CIRIA (2007). "Assessing Risks Posed by Hazardous Ground Gases to Buildings." CIRIA C665.

Suites and Contaminants	No. Samples	Justification
Metals / metalloids, pH, water soluble sulphate, speciated PAHs, SOM and asbestos screen.	7	A basic suite with a broad selection of contaminants tested on samples across the site where no significant evidence of contamination was identified (with the exception of ash, clinker and brick) and no TVOCs identified from the PID tests.
Metals / metalloids, pH, water soluble sulphate, cyanide suite, phenol, TPHCWG, BTEX, MTBE, speciated PAHs, SOM and asbestos screen and 2 stage Waste Assessment Criteria (WAC).	1	Detailed suite and WAC testing on a sample of made ground representative of material likely to be earmarked for offsite removal and disposal.
Metals / metalloids, pH, water soluble sulphate, cyanide suite, phenol, TPHCWG, BTEX, MTBE, speciated PAHs, VOCs, SVOCs, SOM and asbestos screen.	3	Detailed suite including VOCs and SVOCs undertaken in WS101 0.30-0.75m as slight organic / solvent type odour identified. Detailed suite undertaken on natural strata directly below to confirm the absence of contamination Detailed suite including VOCs and SVOCs undertaken in WS104 3.00-4.00m as slight hydrocarbon odour identified and slight sheen identified on groundwater.
SVOC TICs and VOC TICs.	2	SVOC and VOC tentatively identified compounds tested for on WS101 0.30-0.75m and WS104 3.00-4.00m as the odour identified in WS101 could not be identified (slight organic / solvent type).

Table 3-2. Summary of soil sample testing undertaken.

Notes:

If asbestos present during screen identification and quantification will be undertaken.

Metal/metalloids=arsenic, cadmium, chromium, (total and hexavalent), copper, lead, mercury, nickel, selenium, vanadium, zinc and boron; TPHCWG=carbon banded and aromatic/aliphatic split petroleum hydrocarbons; PAH=polycyclic aromatic hydrocarbons, BTEX=benzene, toluene, ethylbenzene and xylenes; MTBE=Methyl tert-butyl ether, VOC=Volatile organic Compounds, SVOC= Semi Volatile Organic Compounds, SOM=Soil Organic Matter, TIC=tentatively identified compounds.

3.3.2 Water Sampling

To establish the condition of shallow groundwater LKC undertook 3no. groundwater samples.

The groundwater samples were collected a minimum of 1 week after drilling had finished and following well development. Sample collection was undertaken using a low flow sampling pump per BS10175¹³, BS5930¹⁴ and BS5667-11¹⁵. guidelines.

All water samples were placed in glass bottles, plastic bottles and septum topped vials and stored in ice packed cool boxes. The samples were sent to Chemtest on the same

¹³ British Standard (2017). "Investigation of Potentially Contaminated Sites – Code of Practice." BS10175:2017.

¹⁴ British Standard (2015). "Code of Practice for Ground Investigations". BS5930:2015.

¹⁵ British Standard (2009). "Water Quality – Sampling. Part 11: Guidance on Sampling of Groundwaters". BS ISO 5667-11:2009.

day for analysis. Many of the tests are UKAS or MCERTS accredited and further details are given in the Certificate of Analysis presented in Appendix F. The sampling suite is presented in Table 3-3.

Suites and Contaminants	No. Samples	Location	Justification
Metals / metalloids, pH, sulphate, cyanide suite, TPHCWG, BTEX, MTBE, speciated PAHs, phenol, VOCs, SVOCs and hardness.	3	WS101 WS104 WS105	Detailed suite undertaken to confirm the absence of groundwater contamination.

Table 3-3: Summary of groundwater sampling tests undertaken.

3.4 Gas Monitoring

6no. gas monitoring visits have been undertaken over a 3 month period.

Monitoring is being undertaken using a Geotechnical Instruments GA5000 in accordance with the monitoring protocol outlined in CIRIA C665¹⁶ (flow rate measured first). The monitoring will aim to be undertaken over a range of weather conditions (including low and falling barometric pressure and heavy rain) to demonstrate worst-case conditions.

The gas monitoring results to date, are reproduced in full in Appendix G.

3.5 Site Investigation Scope

The scope of the contaminated land investigation was agreed with the local authority (Bury Council) prior to undertaking the work (reference LKC 21 1680-SIS, dated 10th February 2023). The response from Rebecca Jones was as follows:

“The scope of the works appears reasonable. However, if evidence of waste is found in the boreholes, I would recommend that further investigation including a trial pitting exercise is carried out to characterise the deposits. Additionally, please ensure that monitoring wells are designed to monitor only one gas source/strata. Where multiple potential sources are present, dual monitoring wells should be considered.”

This investigation was generally in line with the agreed scope: no evidence of waste was found in the boreholes and monitoring wells were installed to target specific strata.

3.6 Geotechnical Testing

3.6.1 In-situ Onsite Geotechnical Testing

In-situ geotechnical tests were performed in the boreholes to further characterise the sub-soil conditions. The following tests were undertaken:

- » Standard Penetration Tests (SPTs) were performed in the window sample boreholes WS101 and WS105 at approximately 1m intervals, generally within the natural strata.
- » Dynamic Probes were undertaken from the surface at locations WS102, WS103 and WS104 to obtain continuous SPTs as predominantly granular

¹⁶ CIRIA (2007). “Assessing Risks Posed by Hazardous Ground Gases to Buildings.” CIRIA C665.

strata was anticipated. Window sample borehole were drilled overcore to allow for correlation of the strata.

- » Pocket Penetrometer tests (giving undrained shear strength) were performed in the window sample boreholes within the natural clay strata.

The SPT and pocket penetrometer readings are provided within the profile logs (Appendix C). The Dynamic Probes results are also provided in Appendix C.

3.6.2 Laboratory Geotechnical Testing

Soil samples taken during the investigation were collected in tubs and bulk bags and sent to Murray Rix Laboratories and Chemtest for geotechnical testing.

Many of the tests are UKAS accredited and further details are given in the laboratory report presented in Appendix E. Table 3-4 shows the geotechnical testing undertaken.

Suites and Contaminants	No. Samples	Justification
pH and water-soluble sulphate	4	Additional samples of natural ground taken across the site to assess the pH and sulphate for geotechnical purposes. pH and water-soluble sulphate are also included in Suites 1, 2 and 5.
Atterberg Limits (plasticity testing)	1	Tested to assess the shrinkability potential.
Particle Size Distribution (PSD)	2	PSD undertaken to confirm grading of soils.
BRE SD1 short suite	4	Samples selected for testing in accordance with British Research Establishment (BRE) Special Digest (SD) 1 - 2005, Concrete in Aggressive Ground, to assess the potential for chemical attack upon concrete

Table 3-4: Summary of geotechnical testing undertaken.

3.6.3 Dynamic Probing

Dynamic probing (DP) was carried out from ground level to approximately refusal at locations WS102, WS103 and WS104 and recorded equivalent 'N' values (3 DP blows = 1 'N' values). Table 3-5 shows the DP and correlating profile logs:

DCP Test Reference	Corresponding Profile Log
DP101	WS102
DP102	WS103
DP103	WS104

Table 3-5: DCP and correlating profile log.

Results are provided in Appendix C.

4 Ground Conditions

4.1 Geology – Generalised Sequence

The ground conditions beneath the site comprised made ground underlain by natural clay / sand / silt and weathered sandstone. A summary section of the logs is provided in Plate 4-1, with additional comments below.

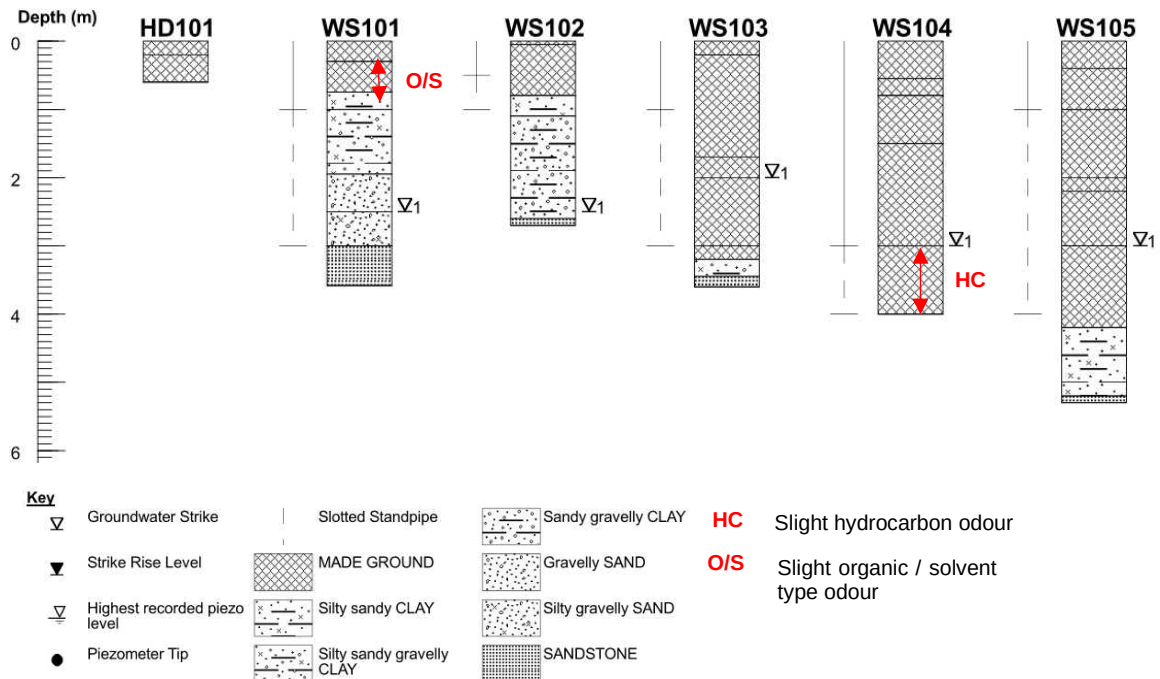


Plate 4-1: Summary of ground conditions.

Additional information on ground conditions:

Made Ground

Made ground was recorded in all boreholes to depths of >0.60-4.20mbgl. The depth of made ground was not proven in HD101 and WS104. The made ground comprised horizons of sand, silt, clay and sand and gravel with anthropogenic material including ash, brick, glass, concrete, clinker and coal. Exceptions to this include:

- Organic to slightly organic slightly sandy SILT in WS101 0.30-0.75mbgl.
- Slightly organic sandy SILT in WS104 3.00-4.00mbgl.
- Gravelly sand predominantly comprising ash and clinker in WS101 0-0.30mbgl, WS102 0.05-0.80mbgl, WS103 0.20-1.70mbgl, WS104 0.80-1.50mbgl, WS105 0.40-1.00mbgl, WS105 2.00-2.20mbgl.

Contamination

A slight organic / solvent type odour was identified in WS101 0.30-0.45mbgl. A slight hydrocarbon odour was identified in WS104 3.00-4.00mbgl and a slight sheen was observed. Plastic and woven material membranes were identified at 3.00mbgl in WS104, above the hydrocarbon contamination. WS104 was terminated at 4.00mbgl to prevent migration of the contamination to deeper strata.

Natural Strata

Natural strata predominantly comprised firm to stiff consistency variably gravelly / sandy / silty CLAY. The clay strata between 0.75-1.50mbgl in WS101 was noted to be slightly organic. A horizon of soft consistency slightly organic slightly sandy silt was recorded between 4.20-5.20mbgl in WS105. Sand was encountered between 1.95-3.00mbgl at WS101.

Weathered sandstone bedrock was encountered in WS101, WS102, WS103 and WS105 from depths of 2.60-5.20mbgl.

4.2 Groundwater

4.2.1 Groundwater Levels

Groundwater strikes were recorded during the investigation in boreholes. In addition, groundwater monitoring within the borehole wells has been undertaken on six occasions. The hand dug pit (HD101) was noted to be dry.

Results are summarised in Table 4-2.

BH	Water Strike Depths (mbgl)	Well Response Zone (mbgl)	No. of Monitoring Visits	Monitoring Depths (mbgl)			Sample Taken?	Evidence of Contam?
				Min	Max	Base		
WS101	2.50	1.00-3.00 (C/S)	6	1.61	1.96	2.79	N	N
WS102	2.50	0.50-1.00 (MG)	6	Dry	0.92	1.05-1.06	N	N
WS103	2.00	1.00-3.00 (MG)	6	1.61	1.75	2.96	N	N
WS104	3.00	3.00-4.00 (MG)	6	2.22	2.50	3.63	N	N
WS105	3.00	1.00-4.00 (MG)	6	1.87	1.98	3.89-3.09	N	N

Table 4-2: Summary of water strike depths within boreholes.

Response Zones:

MG=Made Ground; S=Sand; C=Clay.

4.3 In-Situ Geotechnical Testing

4.3.1 Standard Penetration Tests

In-situ standard penetration tests (SPTs) were undertaken in WS101 and WS105. The results are summarised in Table 4-3 and provided within the profile logs in Appendix C.

Approximate Depth (mbgl)	SPT 'N' Values	
	WS101	WS105
1-2	-	7 (MG)
2-3	38 (S)	1 (MG)
3-4	50 over 225mm (SST)	4 (MG)
4-5	-	3 (MG/Si)
5-6	-	5 (Si/SST)
GW Level	1.61-2.50	1.87-3.00

Table 4-3: Summary of SPT (N) values.

Notes:

MG = Made Ground; SST = Sandstone; S=Sand; Si=Silt.

Groundwater level based on strikes during investigation and monitoring data.

4.3.2 Dynamic Probing

Dynamic probing (DP) was carried out to confirm the depth to refusal. Full DP results are presented in Appendix C. Depths to refusal are shown on Table 4-4.

Borehole/DP	Depth to Refusal (m)
WS102/DP101	2.85
WS103/DP102	4.78
WS104/DP103	6.44

Table 4-4: Summary of Dynamic Probe results.

4.3.3 Pocket Penetrometer Tests

Pocket penetrometer (PP) tests, recording undrained shear strength (s_u), were taken within the clay strata. The results of the PP are summarised in Table 4-5 and provided within the profile logs in Appendix C.

Approximate Depth (mbgl)	Average Undrained Shear Strength (kN/m ²)		
	WS101	WS102	WS103
0-1	30.7	36.5	-
1-2	38.8 142.2	115.7 198.2	-
2-3	-	137.3	-
3-4	-	-	32.7
GW Level	1.61-2.50	Dry-2.50	1.61-2.00

Table 4-5: Summary of pocket penetrometer readings.

Notes:

Groundwater level based on strikes during investigation and monitoring data.

Shear vane readings can be influenced by coarse material including silt.

4.4 Geotechnical Laboratory Testing

4.4.1 Particle Size Distribution

Particle size distribution (PSDs) tests were carried out on granular strata to confirm the material type. Full results are presented in Appendix E and summarised below in Table 4-6.

Location	Depth (mbgl)	Material	Percent passing through sieve		
			63mm	2mm	0.063mm
WS101	2.5-3.0	Silty SAND and GRAVEL	100%	60%	17%
WS102	1.2-1.5	Slightly gravelly slightly gravelly CLAY	100%	89%	69%

Table 4-6: Summary of particle size distribution results.

Notes:

% passing: 63mm = cobble / gravel boundary; 2mm = gravel / sand boundary; 0.063mm = sand / silt boundary.

4.4.2 Atterberg Limits

A representative sample of natural clay was subjected to Atterberg Limits (plasticity) and Moisture Content testing. Results are presented in Appendix E and summarised in Table 4-7.

Table 4-7 also includes the modified plasticity index as detailed in Chapter 4.2-D5 of the NHBC standards (modified plasticity index = plasticity index x % less than 425µm sieve / 100%).

Location	Depth (mbgl)	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Class	Passing 425 micron (%)	Modified Plasticity Index (%)
WS101	1.3-1.5	15	40	13	27	CIM	85	22.95

Table 4-7: Summary of plasticity index testing.

The modified plasticity index is 22.95%. This characterises the clay as having a medium volume change potential.

4.4.3 Sulphate and pH

Water soluble sulphate and pH tests were carried out on soil and groundwater samples. Full results are presented in Appendix D (soils) and Appendix F (groundwater) summarised in Table 4-8.

Strata	pH		Sulphate	
	Soil	Groundwater	Soil (g/l)	Groundwater (mg/l)
Made Ground	7.0-7.9	6.3-6.8	0.02-0.67	11-87
Natural	7.0-7.3		0.02-0.31	

Table 4-8: Summary of pH and sulphate results.

5 Geotechnical Assessment

5.1 Proposed Development

It is understood that the initial proposed development for the applied planning permission includes two semi-detached houses with soft landscaping (as shown in Figure 2). The two semi-detached houses are located to the eastern area of the site.

In this report, the preliminary geotechnical assessment will be undertaken based on the current planning application as in Figure 2. An additional assessment will be also undertaken for the use of the area to the west.

Details of the proposed loadings are not known at this stage and therefore the preliminary geotechnical assessment will be undertaken in terms of undrained shear strength for the cohesive soils and Allowable Bearing Capacity for the granular soils.

The finished ground levels have not been provided and it is therefore anticipated that they will not vary significantly from current levels. However, should the development proposals or finished levels be altered then the recommendations in this section may require revising.

The depths of any underground engineering works (sewers etc.) are unknown and therefore have not been taken into account in the following assessment. It is considered that any such works will be designed so as not to have an effect on, or compromise, proposed or existing foundations or ground stability.

Given the nature of the development it is considered that acceptable risk from settlement is a total settlement value of 25mm for a masonry structure.

5.2 Summary of Ground Conditions

Ground conditions identified at the site are detailed in Section 4.1, and typically comprises 0.75-0.80m of Made Ground over firm becoming stiff and very stiff CLAY over Sandstone to 2.60-3.00mbgl in the east of the site. In the west of the site Made Ground was recorded up to a proven depth of 4.20mbgl (WS105). The extent of the Made Ground was not proven in WS104 which terminated at 4.00mbgl.

5.3 Site Preparation

The site should be cleared and any vegetation below areas of proposed development stripped in accordance with Series 200 of the Specification for Highway Works. This should include:

- » Roots present below the footprint of proposed structures and infrastructure should be grubbed out and the resulting void infilled with suitable compacted engineered fill;
- » Redundant services should be sealed off and grubbed out and replaced with suitable compacted engineered fill; and,
- » Buried structures and old foundations have been encountered on site. These should be excavated from below the proposed development footprint with the resulting void backfilled.

The near surface soils may potentially be disturbed by weathering and site traffic. Precautions should be taken to avoid this, as excessive disturbance may result in more onerous floor slab design, road cap thickness and increased amount of site disposal

etc. Based on site observations the near surface soils may require at least some treatment or reinforcing to allow safe movement of construction plant and labour. A working platform will be required for piling plant.

5.4 Foundation Conditions and Bearing Capacity

5.4.1 General

It is considered that the Made Ground is not suitable for a founding material due to the inherent variability of the material. Foundation options are therefore:

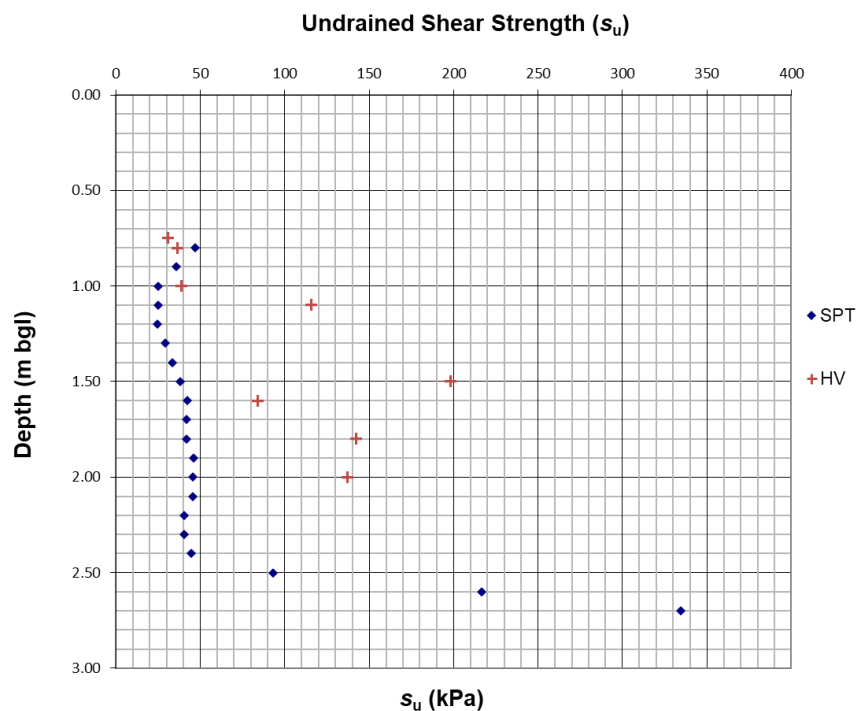
- » Shallow strip foundations in the east of the site where natural CLAY is encountered at shallow.
- » Deep strip foundations in to the underlying Clay;
- » Conventional strip footings on vibro granular columns in the west of the site; and,
- » Deeper pile foundation.

These options are discussed below:

5.4.2 East of Site

In the east of the site at the location of the proposed residential dwellings, exploratory holes WS101, WS102 and WS103 were undertaken. Natural superficial deposits of CLAY were encountered between 0.75m and 0.80m in WS101 and WS102 respectively however Made Ground was recorded within WS103 which is beneath the footprint of the western property to a depth of 3.30mbgl.

Strength of the natural cohesive material within WS101 and WS102 has been assessed using in-situ testing by Super Heavy Dynamic Probe (SHDP) to give equivalent Standard Penetration Test (SPT) N values and Pocket Penetrometer (PP) to obtain the undrained shear strength (s_u) of the cohesive material. The results of the testing have been plotted against depth as is shown in Graph 5-1 below:



Graph 5-1: Summary of s_u vs depth from in-situ SPT and PP testing.

From Graph 5-1 it can be seen that the strength of the cohesive deposits based on the PP tests typically increase with depth. The results of the SPT testing return fairly uniform undrained shear strengths to a depth of circa 2.50mbgl where the results increase, coincident with encountering bedrock at 2.60mbgl. It is considered that the PP results will give a more representative s_u value, opposed to the cone used in the SHDP tests converted to SPT N values.

A conservative s_u of 50kPa is assigned to the cohesive material from a depth of c. 1mbgl for the natural superficial deposits, returning an allowable bearing capacity (ABC) of 87kN/m² for strip/trench fill foundations.

Strip foundations should be constructed at least 150mm in to the underlying firm to stiff natural CLAY. At this depth an allowable bearing capacity of 87kN/m² has been calculated using a Factor of safety of 3 and an undrained shear strength of 50kN/m² taken from Graph 5-1. However, the presence of significant Made Ground in WS103 would require stepping the foundations to a depth of around 3.20mbgl. Deep strip foundations below 2.50m depth are generally not economic, and it is considered that a mini-pile foundation would provide a more reliable foundation solution.

Atterberg limits determinations, summarised in Table 4-7 show the clay to be of medium plasticity and as such the sides of the foundations may require protection using clay board or similar.

Foundation depths should take account of the presence of existing and proposed trees with foundations deepened locally in accordance with relevant guidance, such as that proposed by NHBC Standards for a clay of medium plasticity and a modified plasticity index of medium volume change potential. It is understood that the current site use does not include the presence of trees however it would be prudent to future proof the development against the presence of trees at neighbouring properties by taking account of the soil plasticity.

5.4.3 West of Site

In the west of the site Made Ground was encountered to significant depths and no reliance should be made on this material without undergoing some form of ground improvement or by utilising a piled foundation into deeper, more competent strata.

The use of ground improvement techniques such as vibro granular columns will allow shallow foundations to be utilised within the Made Ground. The vibro granular columns should provide a bearing capacity of around 150kN/m² but will also remove variability within the Made Ground. Specialist advice should be sought from a suitably experienced contractor with regard to allowable bearing capacity and settlements.

As an alternative consideration maybe given to the use of mini-piled foundations to transfer loadings through any deep Made Ground / poor ground conditions and bear upon the shallow Sandstone bedrock encountered from depths of between 3.60m (WS103) and 5.20mbgl (WS105).

Use of mini-piles will reduce the amount of offsite disposal of spoil generated from foundation trenches along with reducing the amount of concrete required for the development.

Made Ground has been recorded to a proven depth of 4.20m (WS105) however, at the location of WS104 the Made Ground was not proven with the window sample hole terminated at 4.00mbgl. Consideration must be given to the potential for negative skin friction to have an adverse effect upon the piles.

Pile design should be undertaken by a specialist contractor to allow them to reduce the factor of safety based on their extensive pile testing data.

Should a piled foundation solution be the preferred option then warranty providers, such as NHBC or LABC, may require further information on ground conditions to a minimum of 5m below the base of the pile.

Recommendation

In the east of the site, the footprint of the structures extend over the location of WS103 where Made Ground was recorded to a depth of 3.20mbgl, this will preclude the use of shallow strip foundations and it is recommended that a mini pile foundation is utilised for the proposed properties.

Should the western section of the site be developed for residential housing it is considered that either a piling or ground improvement solution is viable.

5.5 Ground Floor Slabs

At the proposed re-development on the eastern area of the site, Made Ground was recorded to depths of 750mm (WS101) and 800mm (WS102). Warranty providers, such as the NHBC would require a suspended floor to be used where Made Ground is in excess of 600mm.

Due to the presence of varying Made Ground thickness of 3.20->4.00m to the middle and western area of the site, warranty providers, such as LABC¹⁷ and NHBC¹⁸, will require a suspended floor slab to be used for low rise residential developments. Where suspended floor slabs are employed ventilation of the under-floor void will be required to address condensation issues. This would also assist in the mitigation of potential gas ingress issues, if any present.

Floor slabs should be designed by a suitably experienced structural engineer.

5.6 Pavement Construction

It is considered that the topsoil is not suitable for use as a sub-grade. Untreated Made Ground is considered unsuitable as a sub-grade due to its potential variability and potentially low strength/high compressibility. It should be removed to a depth of 0.5m below formation level and sorted to remove any unsuitable or deleterious materials. The sub formation should be rolled and suitable excavated material can then be replaced, up to formation level, in fully compacted thin layers. Any deficit should be made up with suitable imported fill compacted as above. Following this treatment an overall design CBR of 2-5% should be available, although this will require confirmation at a later date through in-situ CBR tests.

Based on the plasticity index the soils are not considered frost susceptible.

¹⁷ LABC (2021). Technical Manual. Version 10. Chapter 4 on Ground Floors.

¹⁸ National Housing Board Council (2022). Substructure, Ground Floors, Drainage and Basements. Chapter 5.

5.7 Drainage

The presence of Made Ground to a depth of 0.75 to >4.00mbgl across the site may result in settlement of the proposed structures. It is therefore recommended that drain runs are designed using steeper gradients and flexible joints to allow for some differential settlement.

5.8 Concrete Durability

Based upon the results of the chemical analyses summarised in Table 4-8 it is considered that subsurface concrete can be designed in accordance with Design Sulphate Class DS-2, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-2s in accordance with the recommendations provided in BRE Special Digest 1 (2005) for Made Ground soils and DS-1 and AC-1 for the natural strata. For this assessment, the groundwater was considered mobile, as groundwater was encountered at depths of between 0.66mbgl and 4.00mbgl.

5.9 Excavations

Site observations indicated that excavations should be feasible in the near surface with normal plant, however obstructions may be present in the near surface including former foundations and former floor slabs, possibly in the middle of the site. It is anticipated that any obstructions will be grubbed out during the reduced level dig for the sub structure works.

Groundwater seepage was recorded in a number of the exploratory holes. Generally, the exploratory holes were stable during excavation and the Made Ground and natural deposits included granular strata containing perched groundwater. The short- and long-term stability of near vertically sided excavations can therefore not be guaranteed and random and sudden instability within these soils should be anticipated.

Due to the variability of the Made Ground it is considered that all excavations are supported or battered back in accordance with guidance contained in CIRIA R97¹⁹. It is considered that conventional sump pumping should be adequate, where groundwater is encountered during construction works.

5.10 Construction Activity and Inspection

The following activities and inspections should be incorporated into the site works:

- » Due to the variability of the soils at the site it is recommended that sufficient allowance is made for the inspection of formation and sub formations to foundations.
- » Excavations where access is required should be subject to a risk assessment from a competent person and where appropriate mitigation measures such as benching back the sides or use of support systems in accordance with CIRIA R97 utilised.
- » It is considered that de-watering may be required, especially following periods of heavy rainfall. Removal of surface water and water within trenches should be possible with conventional sump pumping. Discharge of any water should be agreed with the relevant regulatory body and be undertaken under a trade effluent discharge, where required. Measures to remove silt and suspended solids may be required and consideration should be given to provision of space for settling tanks or an attenuation pond.

¹⁹ CIRIA Report 97 – Trenching Practice – Second Edition (2001 revision).

- » Based on the site observation during excavations, it is possible that groundwater pumped from trenches may require treatment using a water/oil interceptor. Discharge limits and treatment should be agreed as part of the trade effluent discharge.
- » Where access to confined spaces is required appropriate mitigation measures should be addressed within the Construction Stage Health and Safety Plan. Particular account should be taken of the gas results.
- » The presence of potential contamination and mitigation measures should be addressed as part of the Construction Stage Health and Safety Plan and should include measures to design out the risks, reduce their impact and finally the use of Personnel Protective Equipment (PPE).

6 Generic Risk Assessment

6.1 Introduction

Current good practice requires that the findings from a site investigation should be evaluated on a site-specific basis, using a risk-based approach. Risk assessment involves identification and evaluation of the hazards presented by the concentrations of contaminants measured followed by an evaluation of the risks which are associated with these hazards (LCRM²⁰). Information gathered from the risk assessment has been collated in the revised contamination conceptual model in Section 6.6.

6.2 Soil Risk Assessment

6.2.1 Methodology

With regards to the soil risk assessment LKC will use the following hierarchy:

- Category 4 Screening Levels (C4SLs).
- LQM Suitable 4 Use Levels (S4ULs).
- ATRISK Soil Screening Values (SSVs) and CL:AIRE Generic Assessment Criteria (GACs).

The proposed development is for residential houses with gardens, therefore the assessment criteria for residential with plant uptake has been used.

All criteria have been generated using the CLEA V1.06 model²¹ based either on 1%, 2.5% and 6% Soil Organic matter (SOM). Results will be compared to the nearest appropriate SOM.

A summary of the generic assessment criteria is provided in Appendix H. ATRISK SSVs were not required for this dataset and have not been included.

B(a)P as Surrogate Marker

LKC consider the main risk drivers for PAHs are benzo(a)pyrene (B(a)P) and naphthalene. This is due to B(a)P possibly being a carcinogen and most toxic of the PAHs^{22,23} and naphthalene the most volatile and soluble²⁴. The new C4SLs indicate B(a)P as a surrogate marker for carcinogenic PAHs, if it falls within appropriate limits, since the risk from other non-carcinogenic PAHs are considered negligible²⁵. For B(a)P to be used as a surrogate marker it should follow the profile described by the HPA (2008)²⁶ and CL:AIRE (2013). Naphthalene will be treated separately using the LQM S4ULs.

Based on the above assumption for PAHs, LKC undertook an assessment of the data for the site with regards to using B(a)P as a surrogate marker for carcinogenic PAHs

²⁰ Land Contamination Risk Management (LCRM) <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>

²¹ EA (2008). "CLEA Software (Version 1.05) Handbook." Science Report – SC050021/SR4.

²² EA (2002). "Contaminants in Soils: Collation of Toxicological Data and Intake Values for Humans. Benzo[a]pyrene." R&D Publication TOX2.

²³ USEPA (1984). "Health Effects Assessment of Polycyclic Aromatic Hydrocarbons (PAHs). EPA 540/1-86-013."

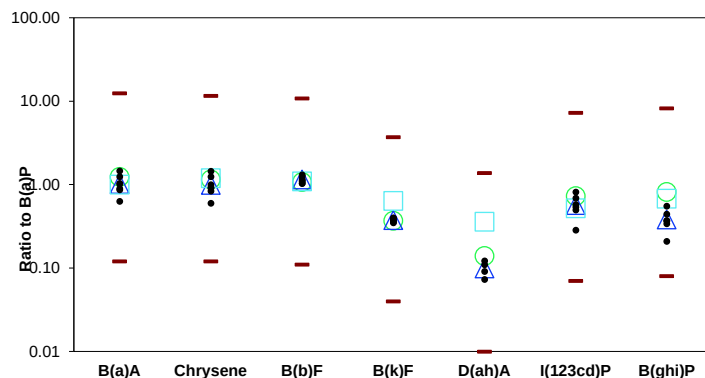
²⁴ EA (2003). "Review of the Fate and Transport of Selected Contaminants in the Soil Environment." Draft technical report P5- 079/TR1.

²⁵ CL:AIRE (2013). "SP1010: Development of Category 4 Screening Levels and Assessment of Land Affected by Contamination – Final project Report."

²⁶ HPA (2010). "HPA Contaminated Land Information Sheet: Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs)." Version 3.

as per HPA and CL:AIRE guidelines. The primary toxicological study related to Culp *et al.*²⁷, which was based on coal tar mixtures (>80,000mg/kg of total PAHs) fed in food to mice over a two-year carcinogenicity study.

Graph 6-1 summarises the study site data with respect to how the ratios of carcinogenic PAHs relate to B(a)P, within the confidence limits provided in the HPA document.



Graph 6-1: The ratio of PAH to B(a)P in soil for all available data at the site based on 6 samples (where values were >LOD to allow the calculation of a ratio).

Notes:

B(a)P=Benzo(a)pyrene; D(ah)A=Dibenzo(ah)anthracene; B(a)A=Benzo(a)anthracene; B(b)F=Benzo(b)fluoranthene; B(k)F=Benzo(k)fluoranthene; I(123cd)P=Indeno(123cd)pyrene; B(ghi)P=Benzo(ghi)perylene

●=Ratio to B(a)P for all data; ○=Mean ratio to B(a)P for Culp data; △=Mean ratio to B(a)P from all data at the site
□=Mean ratio to B(a)P for UK data presented by HPA; ■=Upper and Lower limits (order of magnitude from Culp data)

All the data points that could be used to calculate ratios fall inside the upper or lower limits.

Based on this distribution of data LKC considers B(a)P can be used as a surrogate marker for carcinogenic PAHs and the C4SL criteria is suitable for this dataset.

Other Contaminants with no C4SLs, LOM S4ULs, ATRISK SSVs or CL:AIRE GACs

Where generic assessment criteria have not been derived (mainly due to insufficient toxicological data), the results were compared against contaminants of assumed likely similar toxicity (with some conservatism) as shown below:

- » Dibenzofuran and carbazole: compared to residential with plant uptake C4SL for benzo(a)pyrene (5mg/kg). These contaminants are a byproduct of organic combustion but can be naturally occurring. The Material Safety Sheets indicates these compounds are not volatile and considering there is no toxicological information available, LKC compared the analytical results to one of the most toxic PAH as a precaution.
- » p-Isopropyltoluene: compared to residential with plant uptake S4UL for toluene (660mg/kg 6% SOM).
- » 2-methylnaphthalene: compared to residential without plant uptake criteria S4UL for naphthalene (13mg/kg 6% SOM). LKC considers this appropriate given that the guidance provided on the ATSDR website²⁸ indicates that the oral toxicity of 2-methylnaphthalene is within an order of magnitude to that of naphthalene, although it was unknown what an appropriate inhalation reference dose is.

²⁷ Culp, S; Gaylor, D; Sheldon, W; Goldstein, L and Beland, F (1998). "A Comparison of Tumours Induced by Coal Tar and Benzo-a-pyrene in a 2-Year Bioassay." *Carcinogenesis*. Vol 19, no. 1, pp. 117-124.

²⁸ ATSDR (2005). Public Health for naphthalene, 1-methylnaphthalene and 2-methylnaphthalene.

6.2.2 Soil Results Comparison against Assessment Criteria

All analysis sheets are presented in Appendix D. Elevated and pertinent results are presented in Table 6-1.

Contaminant	Units	No. of samples	Elevated Results	Sample Location	Criteria (6%)	Source of Criteria
Metals						
Arsenic	mg/kg	15	59	HD101 (0-0.2m)	37	C4SL
			58	WS103 (0.2-1.2m)		
			186	WS104 (0.8-1.5m)		
			42	WS104 (2.0-3.0m)		
			140	WS104 (3.0-4.0m)		
			47	WS105 (3.0-4.0m)		
Lead	mg/kg	15	730	WS101 (0.3-0.75m)	200	C4SL
			248	WS102 (0.05-0.8m)		
			549	WS104 (2.0-3.0m)		
			656	WS104 (3.0-4.0m)		
			453	WS105 (3.0-4.0m)		
Chromium (III)	mg/kg	15	7270	WS101 (0.3-0.75m)	910	S4UL
			3040	WS104 (3.0-4.0m)		
PAHs						
Benzo(a)pyrene	mg/kg	15	5.03	WS104 (0.8-1.5m)	5	C4SL
GENERAL						
pH	pH	15	Range 7.0-7.9			
SOM	%	15	Range 0.3-30.3			
Asbestos	N/A	15	Detected (see Table 6-2)			

Table 6-1: Summary of elevated and pertinent analytical results.

Notes:

Only results that exceeded assessment criteria have been shown and results from **all depths** are noted. Results have been compared to the nearest appropriate SOM.

Asbestos was identified, as detailed in Table 6-2.

Sample Location	ID	Type	Total Asbestos (%)
HD101 (0-0.2m)	Amosite	Bundles	<0.001
WS104 (3.0-4.0m)	Chrysotile	Bundles	<0.001
WS105 (3.0-4.0m)	Chrysotile	Bundles	<0.001

Table 6-2: Details of asbestos identified.

Elevated results have been identified for arsenic (HD101, WS103, WS104, WS105), lead (WS101, WS102, WS104, WS105), chromium (III) (WS104) and B(a)P (WS104).

6.2.3 Hazard Quotient

To examine the potential additivity of toxicological effects between the petroleum hydrocarbon fractions, a Hazard Index (HI) as described by the Environment Agency²⁹ technical report was calculated for the samples. This should be undertaken when there are no elevated petroleum hydrocarbons, when compared to assessment criteria of individual fractions. A HI was calculated for WS101 0.30-0.75m (See Appendix H) and is summarised in Table 6-3. A HI was not calculated for WS101 0.75-1.00m, WS102 0.05-0.80m or WS104 3.00-4.00m as no / minimal petroleum hydrocarbon fractions were present.

²⁹ EA (2005). "The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils." Science report P5-080/TR3.

HI results are presented in Table 6-3.

Sample Location	Hazard Index (6% SOM)	Further consideration required?
WS101 (0-0.5m)	0.36	N

Table 6-3: Hazard Index.

As the Hazard Index is <1, no further consideration is required.

6.2.4 Direct Contact Risk – Pollutant Linkage 1

Metals

Elevated metals (arsenic and lead) have been identified on site. Given the number and location of elevated samples, the contamination is considered to be site wide. The source of the contamination is expected to the ash and clinker noted in the made ground.

Elevated chromium (III) has been identified in WS101 (0.30-0.75m) and WS104 (3.00-4.00m). LKC anticipate that the source of the chromium (III) is likely to be associated with the made ground / former refuse tip on site.

At the concentrations identified, the contaminants are considered to pose a potential risk to future site users (residents) in gardens and soft landscaped areas, where made ground may be exposed / in contact with home-grown produce. The principal pathways are the ingestion pathways (soil, dust and home-grown produce) and dermal contact.

The probability of metal contamination affecting site users is likely. With a medium consequence, the risk is considered to be moderate, and remediation (environmental cover system) is recommended.

PAHs

Marginally elevated B(a)P has been identified in WS104 (0.50-1.45m) at a concentration of 5.03mg/kg. The source of the B(a)P is expected to the ash and clinker noted in the made ground. No elevated PAHs were identified across the remainder of the site.

Given that elevated B(a)P was identified in one location only and the concentration is marginally elevated (5.03mg/kg vs the GAC value of 5.00mg/kg), LKC consider that the probability of PAH contamination affecting site users is a low likelihood. Given a medium consequence, the risk is considered to be moderate / low. A low risk is considered appropriate, and the remediation associated with metal contamination will mitigate any risk.

Petroleum Hydrocarbons / SVOCs / VOCs

A slight organic / solvent type odour was identified in WS101 0.30-0.75m. Soil tested from this location identified low concentrations of both light-end (including BTEX compounds) and heavy-end hydrocarbons, however none were above the assessment criteria. The Hazard Index for this sample is less than one. Marginal concentrations of VOCs and SVOCs were also identified however none were above assessment criteria. A sample of natural clay tested from beneath the made ground at this location identified all petroleum hydrocarbon fractions, with SVOCs and VOCs concentrations below the limits of detection.

A slight hydrocarbon odour was identified in WS104 3.00-4.00m and a slight sheen was identified on the water. Samples tested from this location identified marginal concentrations of heavy-end hydrocarbons, however none were above assessment criteria. VOC and SVOC concentrations were all less than limits of detection except for a very low concentration of BTEX (p & m-xylene) which is not above the assessment criteria. A Hazard Index was not calculated for this sample as minimal petroleum hydrocarbon fraction concentrations were identified. Marginal concentrations of hydrocarbons (not above assessment criteria) were also identified in WS102 0.05-0.80m.

No evidence of petroleum hydrocarbon / SVOC / VOC contamination was identified across the remainder of the site; therefore, the contamination is considered to be localised to WS101 and WS104.

Given the olfactory evidence of contamination in WS101 and WS104 and visual evidence (WS104 only), LKC consider the probability of petroleum hydrocarbon / SVOC / VOC contamination affecting site users likely localised to WS101 and WS104. Given a medium consequence, a moderate risk has been identified. Delineation of the source of contamination and removal of impacted material is recommended. The probability of petroleum hydrocarbon / SVOC / VOC contamination affecting site users across the remainder of the site is unlikely, giving a low risk and no remediation is required, however a watching brief should be maintained during earthworks.

The risk associated with the inhalation of vapours is discussed in Section 6.2.5.

Asbestos

Amosite was identified in HD101 (0-0.20m) in the form of bundles, and chrysotile was identified in WS104 (3.00-4.00m) and WS105 (3.00-4.00m) in the form of bundles. The total asbestos in each location is <0.001%. The source of the asbestos is likely to be associated with the refuse tip on site.

The asbestos appears to be localised to the western area of site. However, given the range of made ground the asbestos has been identified in and range of depths, it is possible that further asbestos may be present across the site.

LKC have utilised the Joint Industry Working Group (JIWG) assessment tool for the site for the risk to receptors. The asbestos identified in HD101 0.00-0.20m has been used as a worst-case given its shallow depth. The JIWG tool has been run based on current site conditions (no remediation) where material is present near the surface and identifies a medium risk. The JIWG was also run assuming an environmental cover system where material will be buried at depth and identifies a very low risk. JIWG output sheets are contained in Appendix J.

Asbestos may affect site users in soft landscaping and garden areas via the inhalation of fibres. The probability is considered to be likely. With a medium consequence the risk is considered to be moderate, and remediation is recommended.

Additional consideration should also be given to the risk to workers and offsite receptors during earthworks. This is discussed further in Section 9.1.

6.2.5 Risk from Inhalation of Vapours – Pollutant Linkage 2

A slight organic / solvent type odour was identified in WS101 0.30-0.75m. Samples tested from this location identified low concentrations of light-end hydrocarbons

(including BTEX compounds) and marginal concentrations of VOCs and SVOCs were identified however none were above assessment criteria. The PID recorded 2.40ppm TVOCs.

A slight hydrocarbon odour was identified in WS104 3.00-4.00m. Light-end petroleum hydrocarbon concentrations were all below the limits of detection. VOC and SVOC concentrations were all less than limits of detection except for a very low concentration of BTEX (p & m-xylene) which is not above the assessment criteria. The PID recorded 0.40ppm TVOCs. LKC consider the probability of volatile contaminants affecting site users in areas localised to WS101 and WS104 via the inhalation of vapours is a low likelihood. Given a medium consequence, a moderate to low risk is identified and low risk is considered appropriate. The source delineation and removal recommended at WS101 and WS104 for PL1 associated with petroleum hydrocarbons will mitigate any risk associated with the inhalation of vapours.

No visual / olfactory evidence of volatile contaminants was identified across the remainder of the site during the investigation. The PID did not detect any TVOCs. Confirmatory soil analysis did not detect any VOCs / SVOCs above detection limits. LKC therefore consider the probability of volatile contaminants affecting site users across the remainder of site unlikely. Given a medium consequence, the risk is low and no remediation is required with respect to pollutant linkage 2 however a watching brief should be maintained during earthworks.

6.3 Gas Risk Assessment

6no. gas monitoring visits have been completed on the study site over a 3-month period. Gas monitoring results in full are presented in Appendix G. Following guidance set out in CIRIA C665³⁰ and BS8485³¹ peak methane and carbon dioxide concentrations have been used in the gas risk assessment. In addition, and as per guidance, flow rates were measured first. All gas concentrations, flow, pressure and groundwater levels are shown on Table 6-4.

³⁰ CIRIA (2007). "Assessing Risks Posed by Hazardous Ground Gases to Buildings." CIRIA C665.

³¹ BSI (2019). "Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings." BS8485:2015+A1 2019.

Borehole Ref.	Visit	Peak CH ₄ (%v/v)	Peak CO ₂ (%v/v)	Min O ₂ (%v/v)	Peak CO (ppm)	Steady Flow (l/h)	Ground water Level (mbgl)	Atmos Pressure (mb)	Prev 24hr Pressure Trend
WS101	1	0.7	4.2	10.2	12	<0.1	1.84	973	F
	2	0.1	2.7	0.4	1	6.5	1.61	974	F
	3	0.8	8.0	0.1	11	3.1	1.72	997	F
	4	<0.1	9.4	0.7	0	3.0	1.83	1007	S
	5	<0.1	9.6	0.2	1	<0.1	1.91	1007	S
	6	<0.1	9.6	0.2	0	0.1	1.96	1008	S
WS102	1	<0.1	3.9	16.3	13	<0.1	Dry	974	F
	2	<0.1	4.1	15.7	19	1.0	0.66	975	F
	3	0.1	0.9	19.4	3	<0.1	0.75	998	F
	4	<0.1	3.9	16.7	3	<0.1	0.78	1008	S
	5	<0.1	4.7	13.9	2	<0.1	0.88	1008	S
	6	<0.1	5.8	12.7	0	<0.1	0.92	1008	S
WS103	1	<0.1	2.8	18.5	0	<0.1	1.70	974	F
	2	<0.1	2.5	17.6	0	<0.1	1.61	976	F
	3	<0.1	2.6	18.4	0	<0.1	1.66	997	F
	4	<0.1	2.7	18.0	0	<0.1	1.64	1007	S
	5	<0.1	2.9	16.6	1	<0.1	1.69	1008	S
	6	<0.1	3.1	17.4	0	<0.1	1.75	1008	S
WS104	1	<0.1	1.1	18.9	0	<0.1	2.45	974	F
	2	<0.1	1.2	20.2	0	<0.1	2.22	976	F
	3	<0.1	0.9	20.5	0	<0.1	2.39	996	F
	4	<0.1	1.2	19.5	0	<0.1	2.41	1008	S
	5	<0.1	1.0	19.1	1	<0.1	2.44	1008	S
	6	<0.1	1.2	19.3	1	<0.1	2.50	1008	S
WS105	1	<0.1	0.7	19.3	0	<0.1	1.94	974	F
	2	<0.1	0.4	21.4	0	<0.1	1.87	976	F
	3	<0.1	0.4	21.1	0	<0.1	1.92	997	F
	4	0.2	0.4	20.0	2	<0.1	1.92	1008	S
	5	<0.1	0.4	20.2	1	<0.1	1.93	1008	S
	6	<0.1	0.3	20.6	0	<0.1	1.98	1008	S

Table 6-4: Summary of gas monitoring.

Notes:

If concentrations / flow is zero, then equipment detection limits are assumed.

Table shows peak concentrations of CH₄, CO₂, O₂, H₂S and CO.**Bold** where CO₂ exceeds 5%v/v and CH₄ exceeds 1%v/v.

Atmospheric pressure (over past 24hrs): R=rising, F=falling, S=steady.

Three gas monitoring visits have been undertaken during periods of low pressure (973-997mb) and following on from periods of falling atmospheric pressure.

Methane concentrations ranged between <0.1%v/v and 0.8%v/v. Carbon dioxide concentrations range between 0.4%v/v to 9.6%v/v.

Elevated flow was recorded at WS101 during visits 2 (6.5l/h), 3 (3.1l/hr) and 4 (3.0l/hr), and a flow of 1.0l/h was recorded at WS102 during visit 2. The remainder of the flow rates recorded have been < 0.1l/h.

Low oxygen concentrations were recorded at WS101 during visits 1-6 (0.1-10.2%v/v). An oxygen concentration of 12.7%v/v was recorded at WS102 during visit 6. Depleted oxygen levels may be potentially associated with localised anaerobic conditions / oxidation process below the ground. In part, oxygen may be replaced by carbon dioxide; however, the balance would suggest it may also have been replaced by nitrogen (minimal CH₄, CO and H₂S detected). The other boreholes did not record low oxygen concentrations. LKC do not consider the low oxygen levels to be a significant risk to the site.

Carbon monoxide was >1ppm in boreholes WS101, WS102 and WS105. The maximum concentration was recorded as 19ppm (WS102). Only workplace exposure limits defined by the HSE are available for carbon monoxide and are not fully applicable to a residential setting. A Short-Term Exposure Limit of 200ppm (15-minute period) and Long-Term Exposure Limit of 30ppm have been defined (8-hour period). Based on the aforementioned exposure limits, carbon monoxide is not expected to pose a significant risk to the proposed site receptors.

Gas Screening Value

In accordance with CIRIA C665³², a Gas Screening Value (GSV) may be calculated. Assuming worst-case scenario maximum gas concentrations and flow for each borehole have been used to calculate the GSV. The GSV can be used to determine the characteristic situation (CS). Table 6-5 shows the maximum GSV for each borehole and the appropriate characteristic situation (based on GSV only).

Borehole Ref.	Max GSV CH ₄	Max GSV CO ₂	Characteristic Situation		TL
			CH ₄	CO ₂	
WS101	0.0520	0.6240	CS1	CS2	Amber 1
WS102	0.0010	0.0580	CS1	CS1	Green
WS103	0.0001	0.0031	CS1	CS1	Green
WS104	0.0001	0.0012	CS1	CS1	Green
WS105	0.0002	0.0007	CS1	CS1	Green

Table 6-5: Summary of worst-case Gas Screening Values (GSV).

Notes:

CS – Characteristic Situation; TL= Traffic Light.

The monitoring well at WS101 was installed within the natural clay and sand. The monitoring wells at WS102-WS105 were installed within the made ground.

Although historic tips are recorded on site, no significant putrescible material was encountered. Made ground was recorded in all boreholes to depths of >0.60-4.20mbgl (unproven at HD101 and WS104). The made ground comprised anthropogenic material including ash, brick, glass, concrete, clinker and coal. Slightly organic sandy silt was encountered at WS101 (0.45m thickness at 0.35-0.70mbgl-above the response zone) and WS104 (1.00m thickness with hydrocarbon odour at 3.00-4.00mbgl, within the response zone).

³² CIRIA (2007). "Assessing Risks Posed by Hazardous Ground Gases to Buildings." CIRIA C665.

In accordance with CIRIA C665³³, if carbon dioxide and methane are recorded above 5%v/v and 1%v/v respectively, you should consider upgrading the characteristic situation from CS1 to CS2, but this is not a mandatory requirement.

Wilson *et al*³⁴ suggests there is no need to increase the classification if the carbon dioxide is caused by biological respiration of small quantities of organic material. Plate 6-1 summarises the gas monitoring data using the methodology described by Wilson *et al*.

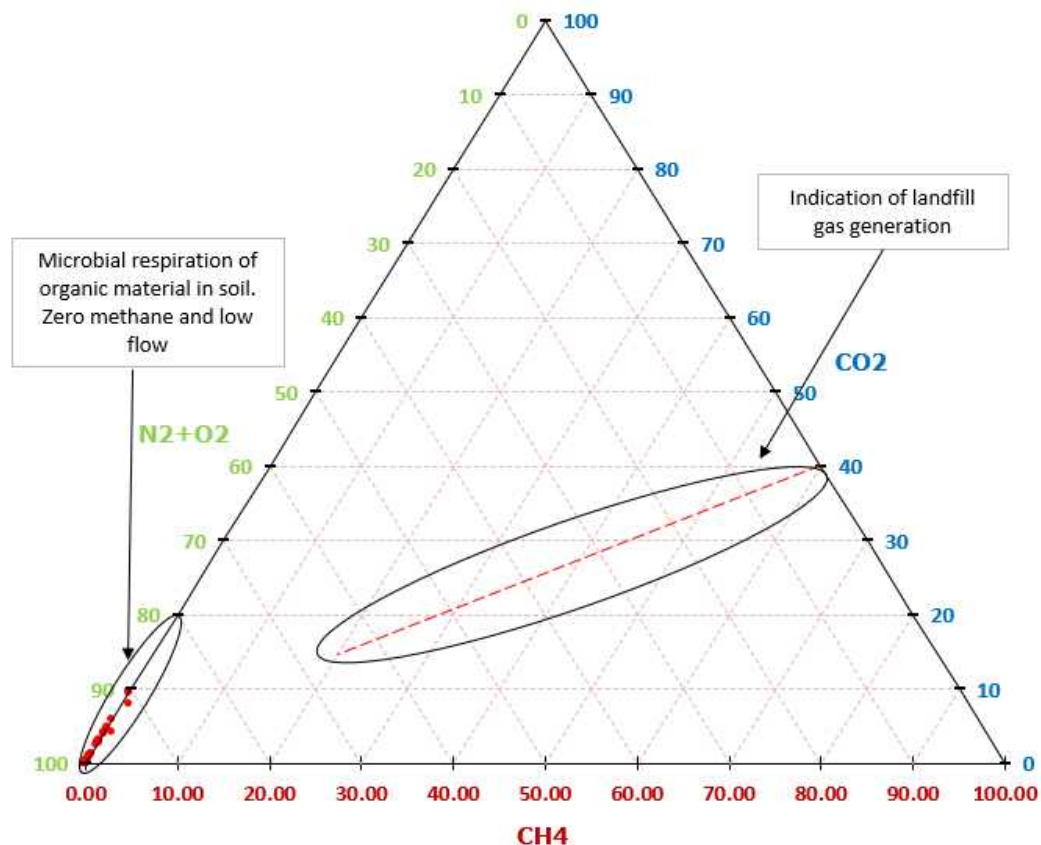


Plate 6-1: Ternary Plot Showing Gas Monitoring Data.

Note:

Interpretative zones taken from Wilson *et al*.

Wilson *et al*. goes on to say: “where gas monitoring results plot within the zone shown...for microbial respiration there is no requirement to increase the Characteristic Situation simply because carbon dioxide concentrations exceed 5%”.

All the data (plotted above) falls within the area of the ternary plot which is indicative of microbial respiration. This indicates the carbon dioxide encountered at WS101 is likely to be from microbial degradation of organic material in the soil, rather than landfill. Furthermore, CL:AIRE Research Bulletin 17 states: “Carbon dioxide in natural soils such as Glacial Deposits and Chalk can often be recorded at up to 15% in monitoring

³³ CIRIA (2007). “Assessing Risks Posed by Hazardous Ground Gases to Buildings.” CIRIA C665.

³⁴ Wilson S, Collins F and Lavery R (2018). Using Ternary Plots for Interpretation of Ground Gas Monitoring Results. Ground Gas Information Sheet No.1. Ambisense and EPG Ltd.

wells, but that this does not pose a risk to development.”. The maximum concentration of carbon dioxide observed on site is 9.6%v/v.

Given the above justification, LKC consider the probability of carbon dioxide and methane gas affecting site users and buildings as unlikely. With a severe consequence, a moderate / low risk has been identified. A low risk is considered appropriate, the site should be classified as CS1 / NHBC green, and no remediation (gas protection measures) are recommended.

6.4 Controlled Water Assessment

LKC considers the Secondary Undifferentiated Aquifer within the superficial deposits and Secondary A Aquifer within the sandstone bedrock as the primary receptors.

LKC have compared groundwater results above Limits of Detection (LOD). Where relevant the review of priority substances takes precedence considering threshold values for groundwater cannot be used ‘as part of site-specific investigations’. The hierarchy is as follows:

- 2016 private water supply standards (UKDWS potable)³⁵.
- 2001 UK Drinking Water Standard (UKDWS)³⁶.
- Resource Protection Values (RPVs)³⁷.
- Minimal Reporting Values (MRVs).

With regards to hydrocarbon mixtures (TPHCWG) for UKDWS, LKC will use the CL:AIRE guidance on petroleum hydrocarbons in groundwater³⁸ based on WHO guidelines.

No elevated contaminants above detection limits or free product were identified in any of the water samples tested.

Based on the above, LKC considers the probability of contaminants on site affecting the Secondary A Aquifer as unlikely. Given the medium consequence, a low risk is anticipated (Pollutant Linkage 4) and no remediation is recommended.

6.5 Potable Water Supply (Pollutant Linkage 5)

Soil results were compared to United Utilities (UU) guidelines for the selection of potable water pipes in land potentially affected by contamination³⁹. Only contaminants of concern, based on the preliminary conceptual model and ground conditions encountered, were analysed. The following contaminants were not considered to be a risk and therefore not included in the analysis suites: ketones and aldehydes.

Elevated petroleum hydrocarbons and total BTEX and MTBE have been identified in WS101 0.30-0.75m. It should be noted typical pipework depths are 0.75mbgl to 1.35mbgl and if pipework is to be laid in the vicinity of WS101, it will likely be laid into the underlying natural strata as LKC have recommended source removal and delineation in the area of WS101.

³⁵ Statutory Instruments (2016). “The Private Water Supplies Regulation 2016.” No. 614

³⁶ EA (2002). “Environment Agency technical advice to third parties on Pollution of Controlled Waters for Part IIA of the Environment Protection Act 1990.”

³⁷ SEPA (2010). “Assigning Groundwater Assessment Criteria for Pollutant Inputs.” WAT-PS-10-01.

³⁸ CL:AIRE (2017). “Petroleum Hydrocarbons in Groundwater: Guidance on Assessing Petroleum Hydrocarbons Using Existing Hydrological Risk Assessment Methodologies.”

³⁹ UU(2011). “United Utilities Water Supplementary Guidance for the Selection of Water Pipes in Land Potentially Affected by Contamination.”

Following on from the delineation recommended as part of PL1 / PL2 and once details of the pipeline location and depths are known a UU Potable Waters Risk Assessment should be undertaken.

At this stage, the probability of organic contaminants affecting potable water pipes is a low likelihood. Given the consequence is considered to be medium, the risk is moderate to low. As no elevations have been identified at typical pipework depth, a low risk is considered appropriate, and no remediation is likely to be required (subject to results of UU Risk Assessment to be undertaken after delineation work is completed).

6.6 Revised Contamination Conceptual Model

The preliminary contamination conceptual model (Table 2-2) has been revised following the risk assessments undertaken in Sections 6.1-6.5. The revised contamination conceptual model follows the same methodology and guidance used in the preliminary contamination conceptual model. The risk matrix is provided in Appendix A. The revised contamination conceptual model is presented in Table 6-6.

Where a very low risk is identified, no specific remediation is required.

Where a low risk is identified, some form of remediation may be required depending on the pollutant linkage, the type and concentration of contaminants present and the proposed development.

Where a moderate/low risk is identified, an assessment will be undertaken to establish what category the pollutant linkage will fall into.

Where a moderate or higher risk is identified, remediation or further investigation work is recommended.

Further details of the remedial proposals and a remedial option appraisal are given in Section 9.

Pollutant Linkage	Pathway	Receptor	Contaminant	Probability	Consequence	Risk	Recommendation
PL1	- Dermal contact. - Inhalation of soil, fibres and dust. - Ingestion of soils, dust, home-grown produce, soil attached to home-grown produce. - Windblown dust.	- Future site users. - Offsite receptors.	ACM: - Chrysotile, amosite. Metals: - Arsenic, lead, chromium (III).	Likely	Medium	Moderate	- Remediation recommended to include an environmental cover system in gardens / soft landscaping areas ^{*1} .
			Hydrocarbons, VOCs, SVOCs (localised to WS101 and WS104). - Visual / olfactory evidence of contamination.	Likely	Medium	Moderate (localised)	- Further investigation to delineate the source of the contamination at locations WS101 and WS104 and to remove impacted material off site.
			PAHs: - B(a)P.	Low Likelihood	Medium	Moderate / Low	- No remediation recommended.
			Hydrocarbons, VOCs, SVOCs (remainder of site) - None identified.	Unlikely	Medium	Low	- No remediation required however a watching brief should be maintained during earthworks.
PL2	- Inhalation of vapours. - Migration through permeable strata and preferential pathways.	- Current residents. - Future site users. - Offsite receptors.	Volatile Contaminants (localised to WS101 and WS104). - No contaminants elevated however olfactory / visual evidence of contamination.	Low Likelihood	Medium	Moderate / Low (localised)	- Source delineation and removal associated with PL1.
			Volatile Contaminants (remainder of site): - None identified.	Unlikely	Medium	Low	- No remediation recommended however a watching brief should be maintained during earthworks.

Table 6-6: Revised Contamination Conceptual Model.

Notes

^{*1} The conceptual model only takes into consideration the future use of the site and long-term exposure. Consideration should also be given to the short-term exposure of construction workers and nearby land users to ACM containing soils during groundworks. This is discussed further in Section 9.1.

Pollutant Linkage	Pathway	Receptor	Contaminant	Probability	Consequence	Risk	Recommendation
PL3	- Inhalation of gas. - Migration through permeable strata and preferential pathways. - Explosion in confined spaces (methane only).	- Future site users. - Buildings. - Offsite land users.	- Carbon dioxide. - Methane.	Unlikely	Severe	Moderate / Low	- No remediation recommended.
			- Radon	Unlikely (as <1% of homes above action level)	Medium	Low	- (<1%) No protective measures are necessary in the construction of new dwellings or extensions.
PL4	- Surface Run-off. - Migration through permeable strata and preferential pathways - Perched waters migration.	- Groundwater (Secondary Undifferentiated Superficial and Secondary A Bedrock Aquifers.). - Surface water (unnamed water course).	Mobile contaminants: - None identified.	Unlikely	Medium	Low	- No remediation recommended.
PL5	- Ingestion of tainted water supply.	- Future site users (via potable water).	Organic Contaminants: - None identified at typical pipework depth.	Unlikely	Medium	Low	- Barrier piping unlikely to be required. However, this will need to be confirmed once UU risk assessment undertaken.

Table 6-6 (continued): Revised Contamination Conceptual Model.

7 Waste Disposal Assessment

The soil contamination results as presented in Appendix D have been used to help determine the waste classification of material for off-site disposal.

As an initial screen the soil results were inputted into HazWasteOnline™. This is a web-based facility that allows an assessment waste as either hazardous or non-hazardous waste based on relevant guidance and legislation^{40, 41, 42, 43, 44, 45, 46, 47, 48}.

HazWasteOnline™. has been designed to cover, amongst other waste types, the European Waste List of Waste (LoW) code number 17 "Construction and Demolition Waste (Including Excavated Soil from Contaminated Sites)".

Where less than limits of detection (LOD) were recorded, the value of the LOD was inputted.

Where applicable, appropriate metal species based on hazard statements/ molecular weight, site history, ground conditions and likely species present in soils were used (e.g. metal oxides relating to an ash based source).

HAZARDOUS WASTE has been identified at WS101 (0.30-0.75m) based HP10 (toxic for reproduction) and HP14 (ecotoxic) and WS104 (3.00-4.00m) based on HP14 (ecotoxic). LoW code "17-05-03 - soil and stones containing hazardous substances" is considered to be appropriate for both materials. The delineation work associated with PL1 will involve the removal of impacted material off site.

The remainder of samples tested are classified as NON-HAZARDOUS WASTE and LoW code "17-05-04 - soil and stones other than those mentioned in 17 05 03" is suitable. The HazWasteOnline™ output sheets are provided in Appendix K.

7.1 Waste Acceptance Criteria (WAC) Testing

Waste Acceptance Criteria (WAC) testing was also undertaken on 1no. samples representative of material likely to be earmarked for off-site disposal. WAC test results are included in Appendix D.

The WAC limits cannot be used to make an assessment of whether a waste is non-hazardous or hazardous. It is recommended that waste assessment and WAC data is forwarded to a licensed waste disposal operator.

⁴⁰ EA (2018). "Guidance on the Classification and Assessment of Waste (1st Edition v1.1)". Technical Guidance WM3.

⁴¹ CLP Regulation - Regulation 1272/2008/EC of 16 December 2008.

⁴² 1st ATP - Regulation 790/2009/EC of 10 August 2009

⁴³ Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

⁴⁴ WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

⁴⁵ Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014

⁴⁶ 13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

⁴⁷ POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004

⁴⁸ 2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

8 Conclusions

8.1 Geotechnical

It is considered that the Made Ground is not suitable for a founding material due to the inherent variability of the material. The loading should be transferred to the firm becoming stiff with depth CLAY or the SANDSTONE bedrock.

Foundation options will be dependent upon the proposed load and location of structures and it is likely to comprise mini piles in the east of the site, and ground improvement or piled foundations in the west of the site.

A conservative s_u of 35kPa is assigned to the cohesive soils of the natural strata.

Strip foundations should have an Allowable Bearing Capacity (ABC) of 60kN/m² at 1.00mbgl.

Piled foundations should be socketed into the underlying sandstone bedrock and further investigation may be required by warranty providers should a piled solution be selected.

The concrete classification in accordance with BRE Special Digest 1 (2005) is DS-2 AC-2 for Made Ground soils and DS-1 AC-1 for the natural strata.

8.2 Contamination Assessment

A revised contamination conceptual model has been produced by LKC which is summarised in Table 8-2 below (more detailed model provided in Section 6). Where a moderate / low risk was identified, the assumed risk at this stage has been shown in bold.

Pollutant Linkage		Risk	Recommendations
1	Contaminants posing a risk to future site users and offsite receptors via dermal contact, ingestion and inhalation (of soil, dust, fibres and home-grown produce).	Moderate (ACM, metals)	Remediation recommended garden / soft landscaping areas.
		Moderate (hydrocarbons / VOCs / SVOCs – localised)	Further site work to delineate and remove impacted material.
		Moderate / Low (PAHs)	No specific remediation recommended. Remediation associated with metals/ACM will mitigate any risk.
		Low (hydrocarbons / VOCs / SVOCs)	No remediation recommended.
2	Volatile contaminants posing a risk to future site users and offsite receptors via the inhalation of vapours.	Moderate / Low (localised)	Further site work to delineate and remove impacted material as part of PL1.
		Low (remainder of site)	No remediation recommended.

Table 8-2: Summary Risk Table.

Pollutant Linkage		Risk	Recommendations
3	Gas posing a risk to buildings, future site users and offsite land users via the migration of gas into building causing explosion and asphyxiation.	Moderate / Low (methane, carbon dioxide)	Site classified as CS1 / NHBC green. No remediation recommended.
		Low (radon)	No radon protection measures recommended.
4	Mobile contamination posing a risk to controlled waters via the migration through permeable strata.	Low	No remediation recommended.
5	Organic contaminants posing a risk to water pipes.	Low	Barrier piping unlikely to be recommended. However, this will need to be confirmed once UU risk assessment undertaken.

Table 8-2 (continued): Summary Risk Table.

Remedial recommendations are presented in Section 9.

9 Recommendations and Remedial Strategy

9.1 Remediation and Validation Recommendations

Table 9-1 details the further works and remedial recommendations / requirements. The table shows work required pre-construction (i.e. during earthworks) and during / post construction.

Phase	PL	Remediation Requirements	Validation Requirements
Pre-Construction	ALL	<u>Earthworks Inspections / Unexpected Contamination</u> The relevant contractors should be briefed that during development works at the site should any unusual ground conditions and / or visual or olfactory evidence of contamination (including asbestos containing material) be encountered at the site, LKC and the Local Authority should be informed, and further assessment of the material may be required.	Log of work undertaken including photographs. Details of any sampling undertaken and validation of any potential additional remedial work.
	1, 2	<u>Hydrocarbon Hotspot Removal Areas</u> Impacted soils at locations WS101 and WS104 (based on visual / olfactory evidence and the use of a PID) should be excavated and removed. Impacted soils should be placed on an impermeable surface to await removal from site (this may be subject to chemical testing to confirm suitable waste facility). The work should be done under the supervision and instruction of an environmental consultant. If all impacted ground cannot be removed and contamination remains on the ground, further remediation may need to be considered.	Details of work undertaken including photographs. Confirmatory samples of the remaining in-situ soils. Consignment notes confirming the removal of impacted soil.

Table 9-1: Further work, remediation and validation requirements

Notes: See Table 6-6 for pollutant linkage (PL) details.

Phase	PL	Remediation Requirements	Validation Requirements
Build-Phase Construction	1	<u>Environmental Cover System</u> As made ground is relatively deep, it is unlikely to be viable to remove the contaminated soils. Therefore, an environmental cover system is recommended. The environmental cover system should be as follows: Private Back Gardens: 600mm thick environmental cover system comprising: 100mm physical break layer (MOT type 1 material, 20-30mm, minimal fines) and at least 500mm comprising clean inert fill and sufficient topsoil for a growing medium. Private Front Garden / Shared Landscaping: 300mm thick environmental cover system comprising: 100mm physical break layer (MOT type 1 material, 20-30mm, minimal fines) and at least 200mm comprising clean inert fill and sufficient topsoil for a growing medium. The subsoil layer can be replaced by additional topsoil. A diagram of a typical environmental cover system is shown in Appendix K. Areas of TPO's Please note where there are TPO's in influencing distance of the gardens it is likely the arboriculture officer may only allow a 100mm clean cover system over a geotextile membrane.	Measuring depth of environmental cover system using a staff and providing photographic evidence. Photographic evidence of the granular physical break or geotextile layer will also be collected. Chemical validation of imported soils: See Table 9-2.
	3, 4	No remediation recommended for PL3 (gas) and PL4 (controlled waters).	N/A.
	5	<u>Potable Water Pipes</u> It is recommended that a Water Pipeline Assessment is undertaken once the location and depth of potable water pipes are known. Barrier pipe unlikely to be required.	If Barrier Pipe required: Delivery Notes of Pipe Material. Photographs of the Installed Pipe.

Table 9-1 (continued): Further work, remediation and validation requirements.

Notes: See Table 6-6 for pollutant linkage (PL) details.

Other Considerations	<u>Grubbing Out of In-Ground Structures</u> It is recommended that in-ground structures are grubbed out as part of the groundworks.
	<u>Re-use of site won material</u> To ensure material is compliant with appropriate waste regulations, any site won material re-used onsite should be in recourse to appropriate exemptions. A U1 and T5 exemption should be registered. This will allow the following to be used onsite or brought in for use onsite (refer to guidance for types of waste that can be used ⁴⁹): 5,000 tonnes (c. 2,500m³) <u>treatment</u> of crushed concrete / stone. 1,000 tonnes (c. 500³) <u>use of</u> non-hazardous soil 5,000 tonnes (c. 2,500m³) <u>use of</u> clays, sand, gravel, brick, concrete, stone etc. 50,000 tonnes (c. 25,000m³) <u>use of</u> bituminous material to be used in roadways. A Materials Management Plan (MMP) with recourse to the CL:AIRE Code of Practice may be required if volumes exceed exemption limits. This must be registered before material movement starts onsite. If an MMP is required, this needs to be registered by a Qualified Person (QP) and there must be 'certainty of use' for any material re-used onsite or exported to site to ensure there is no 'sham recovery'. For all the above material will need to be tested at the rate and analytical suites presented in Table 9-2.

Table 9-1 (continued): Further work, remediation and validation requirements.

Notes: See Table 6-6 for pollutant linkage (PL) details.

⁴⁹ <https://www.gov.uk/guidance/waste-exemptions-using-waste>

Other Considerations	Asbestos Management Plan Due to the presence of asbestos containing material, it is recommended that additional precautions are taken during site clearance, earthworks and construction in the area of concern. The presence of asbestos in the made ground at the site presents a potential risk of generation of airborne fibres if this material is disturbed, such as for excavations to construct new foundations. This risk can be managed by careful procedures and site monitoring to reduce the risk of airborne fibres, and it is recommended that an appropriate 'Asbestos Management Strategy' is developed and adopted for all intrusive ground works which disturb the made ground in the area of concern. This should be carried out in line with CIRIA C733⁵⁰. This may include asbestos awareness training for all site staff, provision of suitable personal and respiratory protective equipment and air monitoring. With regards to cement bound asbestos, this can be handpicked, doubled bagged and disposed of appropriately to a licenced landfill. Guidance on removing asbestos cement is described in HSE (2012)⁵¹. If ACM is identified in soil arisings then soil should be placed directly into covered skips and disposed of at a suitable licenced landfill, after further testing to quantify the extent of asbestos contamination of the soils. It should be considered that blue asbestos is notifiable and must be removed by a licenced contractor. LKC have utilised the Joint Industry Working Group (JWIG) tool for risk during earthworks. The output is presented below and included in Appendix J. Stage 3 Risk Assessment Outputs <table border="1"> <tr> <td>Probable Licensing Status</td> <td>CAR do not apply</td> </tr> <tr> <td>RPE*</td> <td>None</td> </tr> <tr> <td>Dust Suppression**</td> <td>None</td> </tr> <tr> <td>Hygiene/Decontamination***</td> <td>None</td> </tr> </table> *Where RPE has to be worn continuously for long periods (e.g. more than 1-hour), then powered RPE may be necessary. **Reduction in control measures possible if natural mitigation factors are present (e.g. raining, wet ground) ***Guide only; suitability of selected personal hygiene measures may be reviewed on a site/contamination-specific basis Health and Safety Considerations In working with, removing or treating any contaminating material it is important that any potential risks associated with the actual site works are mitigated by good environmental management of the site during the remedial phases. Standard health and safety precautions (as per HSE guidance⁵²) should be adopted by all workers involved with site enabling and construction works.	Probable Licensing Status	CAR do not apply	RPE*	None	Dust Suppression**	None	Hygiene/Decontamination***	None
Probable Licensing Status	CAR do not apply								
RPE*	None								
Dust Suppression**	None								
Hygiene/Decontamination***	None								

Table 9-1 (continued): Further work, remediation and validation requirements.

Notes: See Table 6-6 for pollutant linkage (PL) details.

⁵⁰ CIRIA (2014). "Asbestos in Soil and Made Ground: A Guide to Understanding and Managing Risks". C733.

⁵¹ HSE (2012). "Removing Asbestos Cement (AC) Debris." A11 Asbestos Essential – Non-licenced Tasks.

⁵² HSE (1991). "Protection of Workers and the General Public During Development of Contaminated Land" London HMSO.

Other Considerations	Piling in Contaminated Land It is understood that the building will be piled into the bedrock. This may provide a preferential pathway for contaminants to the Secondary A Aquifer. Once the method of piling has been determined, good practice for the drilling of piles on contaminated sites should be adhered to, such as guidance provided by the Environment Agency ⁵³ .
	Asbestos Survey A Pre-Demolition and Major Refurbishment Asbestos Survey should be undertaken, and any ACMs removed and properly disposed of, prior to the demolition of the existing buildings, by a suitably qualified professional.

Table 9-1 (continued): Further work, remediation and validation requirements.

Notes: See Table 6-6 for pollutant linkage (PL) details.

9.2 Validation of Subsoil / Topsoil

Chemical validation of all imported soils to be used on site in gardens and soft landscaping areas should be undertaken. Imported soils should be accompanied by a certificate of analysis and source details.

A summary of the required imported material sampling requirements is presented in Table 9-2. Ideally, the material should be sampled at source to prevent double handling if soil fails, with confirmatory sampling undertaken on importation to site. However, where this is not possible then material imported should be segregated based on source and soil type. Validation samples should be taken prior to placement in gardens to ensure suitability for use.

Material Type	Source	Suite of Analysis	Sampling Rate*
Topsoil / Subsoil	Greenfield	Suite A	1 sample per 50m ³ (min. 3 per source)
	Brownfield / Unknown	Suite B	
Subsoil	Natural Site won / imported subsoil	Suite A	1 sample per 150m ³ (min. 3 per source)
Recycled Stone	Any	Suite A	1 sample per 500m ³ (min. 3 per source)
Stone / subsoil	First Generation i.e. quarried sand (subsoil) or stone (break layer)	No testing is required. Certification of material provenance is required.	

Table 9-2: Sampling requirements for imported and site won soils.

Notes:

Suite A - Heavy metals, pH, water soluble sulphate, speciated PAH, soil organic matter and asbestos screen.

Suite B - Heavy metals, pH, water soluble sulphate, speciated PAH, phenol, total and free cyanide, soil organic matter, asbestos screen, banded petroleum hydrocarbons (TPH CWG), BTEX, MTBE.

*Minimum sampling rate of 3 samples per source.

9.3 Site Completion Report

It is recommended that any remediation carried out on the site is validated by a third party and suitable documentary evidence provided in a Site Completion Report, such as photographs, consignment documents and analytical results. This should include as a minimum:

- Validation of the hydrocarbon hotspot removal (WS101 and WS104).
- Provision of waste transfer documents.
- Validation of environmental cover system.
- Verification testing of all imported soil for garden and soft landscaping areas.

⁵³Environment Agency (2001) Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention.

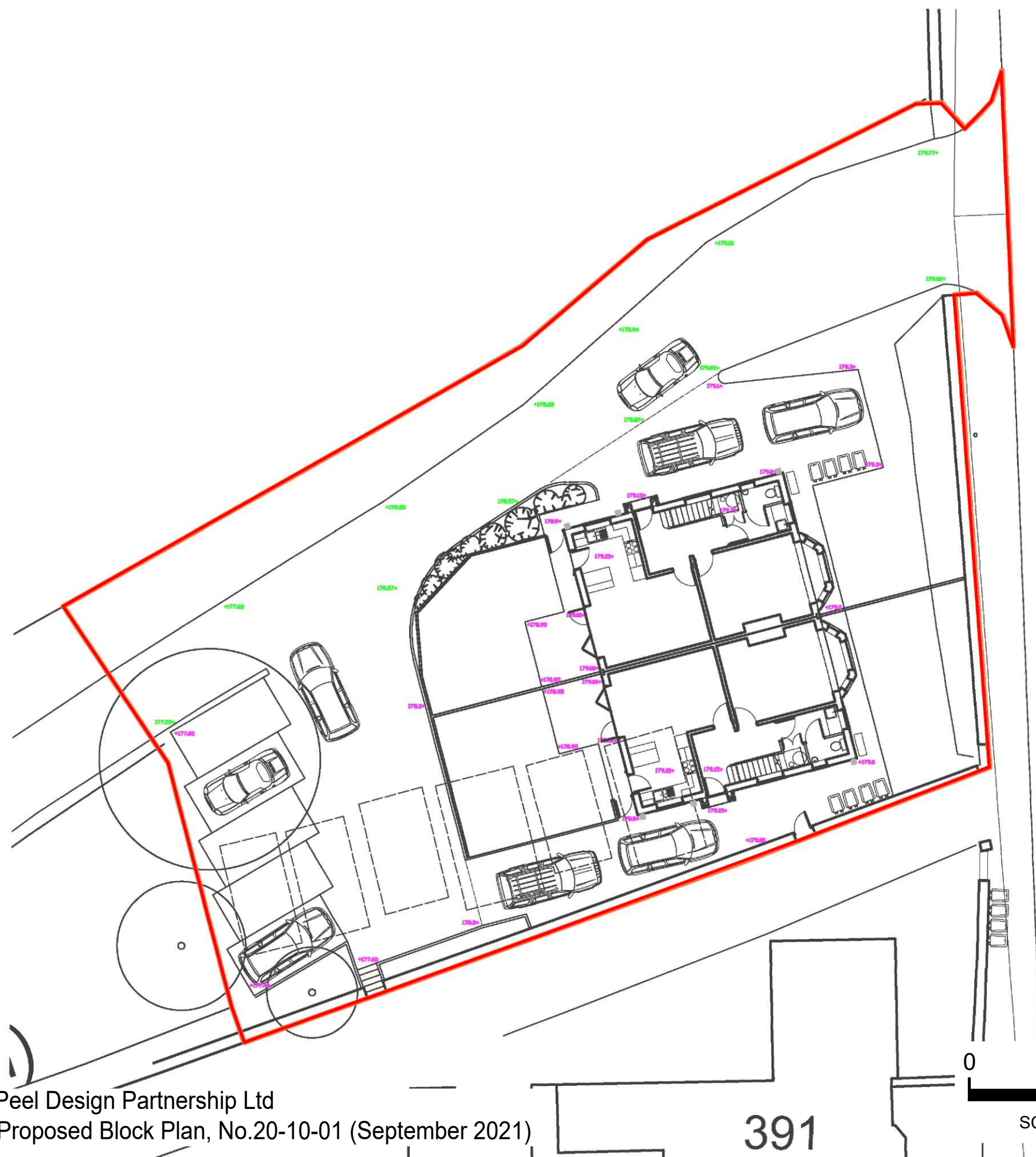
- » Information on the installation of protective pipes and / or sterile trenches, if required.
- » Details of any unexpected contamination identified onsite, suitably risk assessed and / or validated.

The Site Completion Report will assist the Local Authority in the discharge of any future relevant planning condition and will also be of use to solicitors acting on behalf of any prospective conveyancer who may have concerns over the former use of the site. It should be noted that this is an interim report and the final requirements for the Site Completion Report will be included in the final report.

Figures



Client: Steven Mort				Title: Site Location & Boundary Plan			
Site: Whalley Road, Ramsbottom				Scale (see scale bar): 1:25,000 & 1:750 @ A4			
Job No.: LKC 21 1680		Drawn By: EM	Checked By: EK	Drawn: March 2023	Figure: 1		



391

0 10
SCALE (Metres)

Site Boundary

Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.



Client:

Steven Mort

Site:

Whalley Road, Ramsbottom

Title:

Proposed Development Plan

Job No.:

JOB NO.:
LKC 21 1680

Scale (See Scale Bar):

Scale (See Scale Bar):
See Scale Bar

Figure:

Figure:

Revision:

2

Drawn By

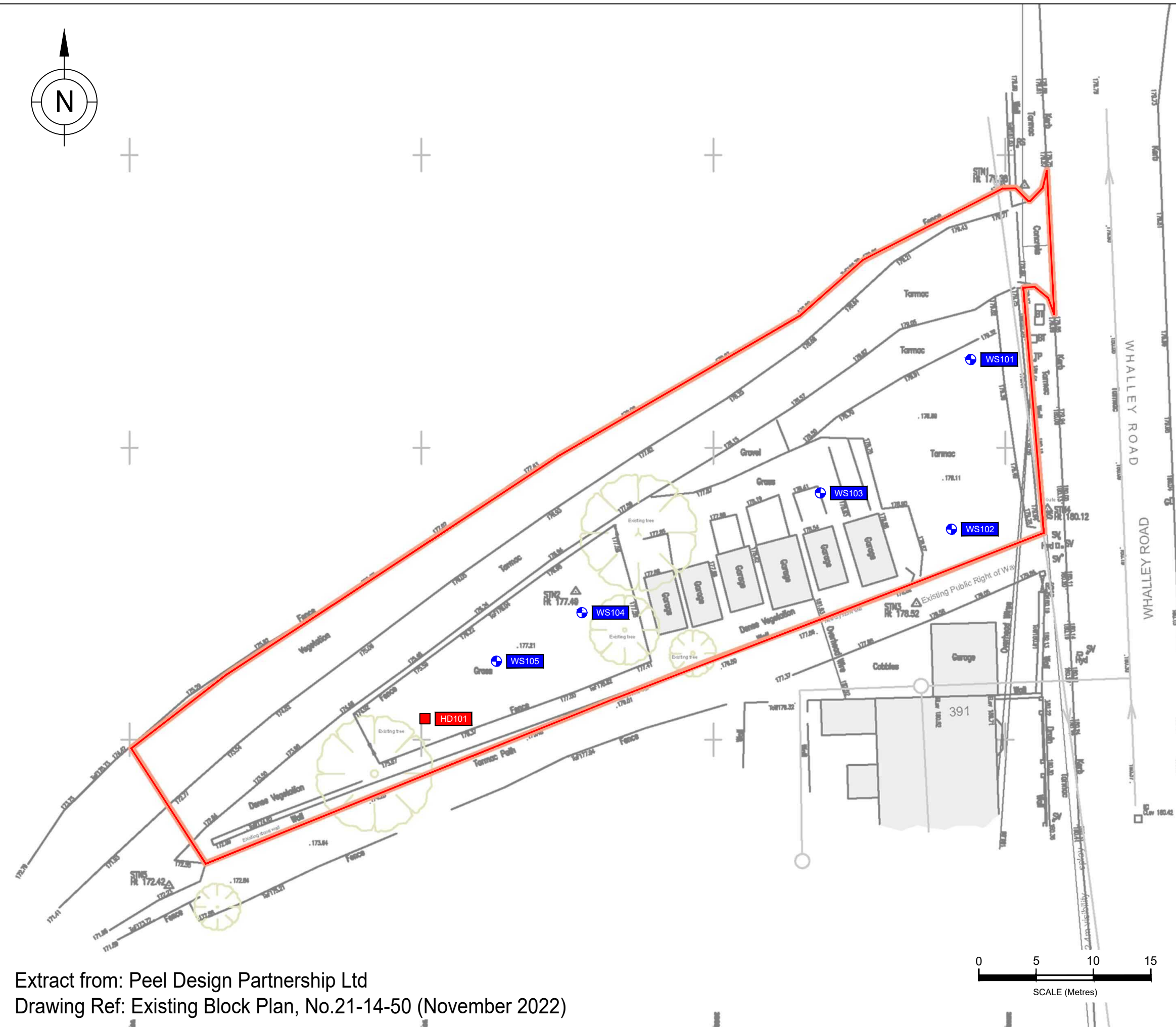
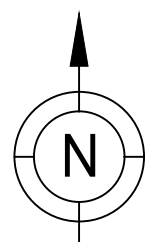
Drawn By
AC

Checked By:

Checked By:
JW

Drawn:	
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Nov 2021



KEY

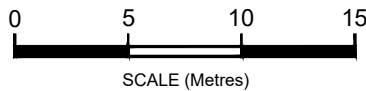
-  Site Boundary
-  Window Sample Borehole (WS)
-  Hand Dug Trial Pit (HD)

Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.



Client: Steven Mort			
Site: Whalley Road, Ramsbottom			
Title: Site Investigation Location Plan			
Job No.: LKC 21 1680	Scale (See Scale Bar): See Scale Bar	Figure: 3	Revision:
Drawn By: AC	Checked By: EM	Drawn: Mar 2023	

Extract from: Peel Design Partnership Ltd
Drawing Ref: Existing Block Plan, No.21-14-50 (November 2022)



Appendix A

Risk Matrix

Risk Evaluation

The method for risk evaluation is a qualitative method of interpreting the output from the risk estimation stage of the assessment, based on CIRIA 552⁵⁴. It involves the classification of the:

- » Magnitude of the potential consequence (severity) of the risk occurring (Table A).
- » Magnitude of the probability (likelihood) of the risk occurring (Table B).

Consequence (Severity)		
Classification	Definition	Example
Severe	- Short term (acute) risk to human health likely to results in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. - Short term risk of pollution (note: water Resources Act contains no scope for considering significance of pollution) of sensitive water resource. - Catastrophic damage to buildings/properties. - A short-term risk to a particular ecosystem, or organism forming part of such ecosystem (note: the definition of ecological systems within the Draft Circular on Contaminated Land, DETR, 2000).	- High Concentrations of cyanide on the surface of an informal recreation area. - Major spillage of contaminants from site into controlled waters. - Explosion, causing building collapse (can also equate to short term human health risk if buildings are occupied).
Medium	- Chronic damage to Human Health ('significant harm' as defined in DETR, 2000). - Pollution of sensitive water resources (note Water Resources Act contains no scope for considering significance of pollution). - A significant change in a particular ecosystem, or organism forming part of such ecosystem.	- Concentrations of a contaminant from site exceed generic, or site-specific assessment criteria. - Leaching of contaminants from a site to a major or minor aquifer (Principal and Secondary). - Death of a species within a designated nature reserve.
Mild	- Pollution of non-sensitive water resources. - Significant damage to crops, buildings, structures and services ('significant harm' as defined in DETR, 2000). - Damage to sensitive buildings/structures/services or the environment.	- Pollution of non-classified groundwater. - Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).
Minor	- Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. - Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc). - Easily repairable damage to buildings, structures and services.	- The presence of contaminants at such concentrations that protective equipment is required during site works. - The loss of plants in a landscaping scheme. - Discoloration of concrete.

Table A. Classification of Consequence

Probability (Likelihood)	
Classification	Definition
High Likelihood	- There is a pollutant linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.
Likely	- There is a pollutant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. - Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	- There is a pollutant linkage and circumstances are possible under which an event could occur. - However, it is by no means certain that even over a longer period such event would take place and is less likely in the shorter term.
Unlikely	- There is a pollutant linkage, but circumstances are such that it is improbable that an event would occur in the very long term.

Table B. Classification of Probability.

⁵⁴ CIRIA C552 (2001) Contaminated Land Risk Assessment - A Guide to Good Practice.

These classifications are then compared to indicate the risk presented by each pollutant linkage (Table C). It is important that this classification is only applied where there is a possibility (which can range from high likelihood to unlikely) of a pollutant linkage existing.

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate / Low Risk
	Likely	High Risk	Moderate Risk	Moderate / Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate / Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate / Low Risk	Low Risk	Very Low Risk	Very Low Risk

Table C. Comparison of Consequence against Probability

Once the risk has been determined the corresponding action can be assessed (Table D).

Risk	Action Required
Very High Risk	- There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. - This risk, if realised, is likely to result in a substantial liability. - Urgent investigation (if not already undertaken) and remediation are likely to be required.
High Risk	- Harm is likely to arise to a designated receptor from an identified hazard. - Realisation of the risk is likely to present a substantial liability. - Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term.
Moderate Risk	- It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. - Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low Risk	- It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low Risk	- There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

Table D. Description of the Classification and Likely Action Required.

Where a very low risk is identified no specific remediation is required.

Where a low risk is identified, some form of remediation may be required depending on the pollutant linkage, the type and concentration of contaminants present and the proposed development.

Where there is a moderate/low risk identified, an assessment will be undertaken to establish what category the pollutant linkage will fall into.

Where LKC identifies a moderate or higher risk, remediation or further investigation work is recommended.

Appendix B

BGS GeoReport - Radon

ABIGAIL BARKER
UNIT 29
ETON BUSINESS PARK
ETON HILL ROAD
RADCLIFFE
MANCHESTER
M26 2ZS
UNITED KINGDOM

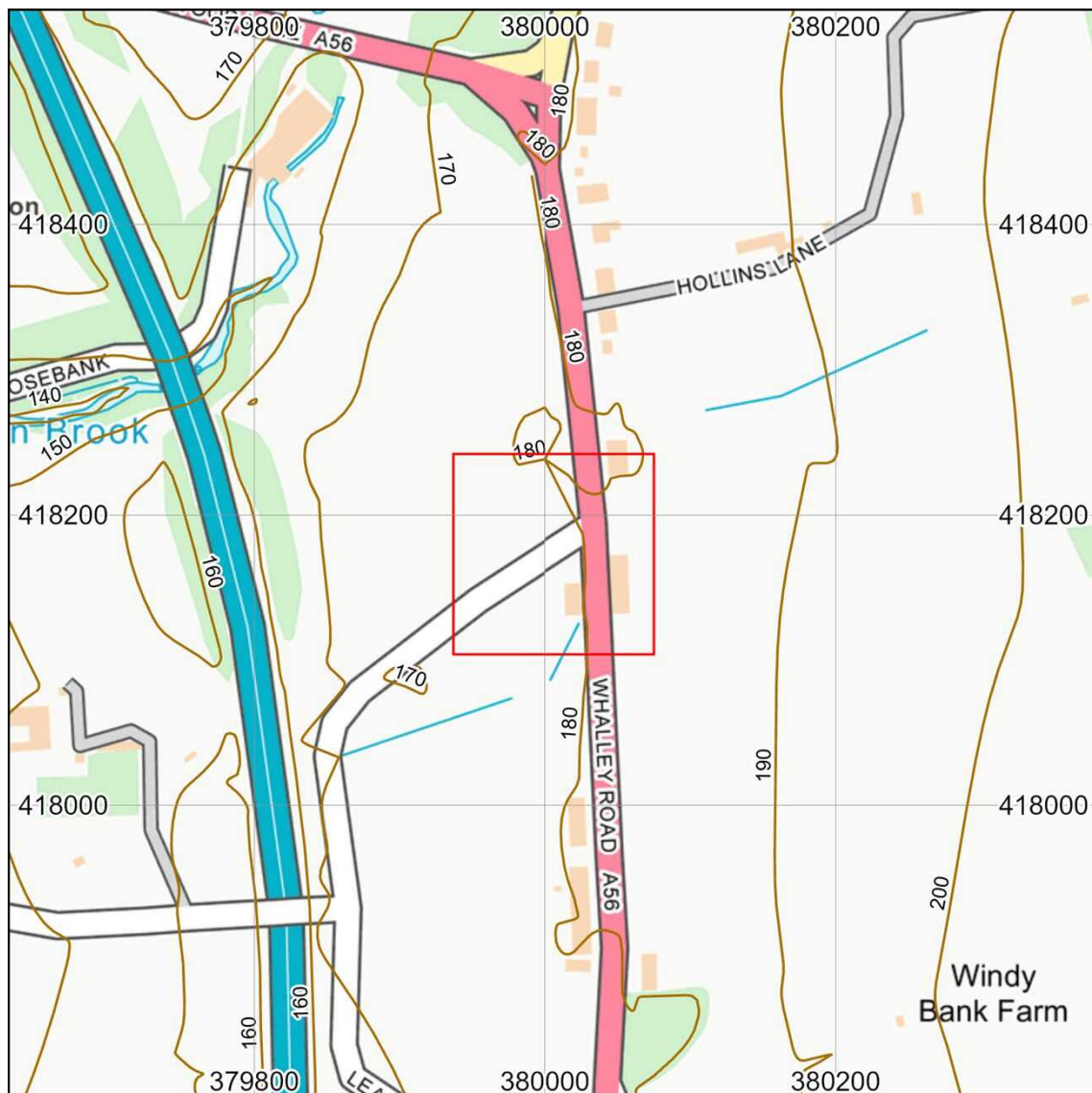
Radon Report

Advisory report on the requirement for radon protective measures in new buildings, conversions and extensions to existing buildings. The report also indicates whether a site is located within a radon Affected Area

Report Id: *BGS_342246/59695*

Client reference: LKC 21 1680

Search location



Contains OS data © Crown Copyright and database right 2025. OS OpenMap Local: Scale: 1:5 000 (1cm = 50 m)

Search location indicated in red

This report describes a site located at National Grid Reference 380006, 418173. Note that for sites of irregular shape, this point may lie outside the site boundary. Where the client has submitted a site plan the assessment will be based on the area given.

Radon Report: UK

When extensions are made to existing buildings in high radon areas, or new buildings are constructed in these areas, the Building Regulations for England, Wales, Scotland and Northern Ireland require that protective measures are taken against radon entering the building.

This report provides information on whether radon protective measures are required. Depending on the probability of buildings having high radon levels, the Regulations may require either:

1. No protective measures
2. Basic protective measures
3. Full protective measures

This is an advisory report on the requirement for radon protective measures in new buildings, conversions and extensions. The report also indicates whether a site is located within a radon Affected Area

Requirement for radon protective measures

The determination below follows advice in *BR211 Radon: Guidance on protective measures for new buildings (2023 edition)*, which also provides guidance on what to do if the result indicates that protective measures are required.

Is the property in an area where radon protective measures are required for new buildings or extensions to existing ones as described in publication BR211 (2023 edition) Radon: Guidance on protective measures for new buildings?

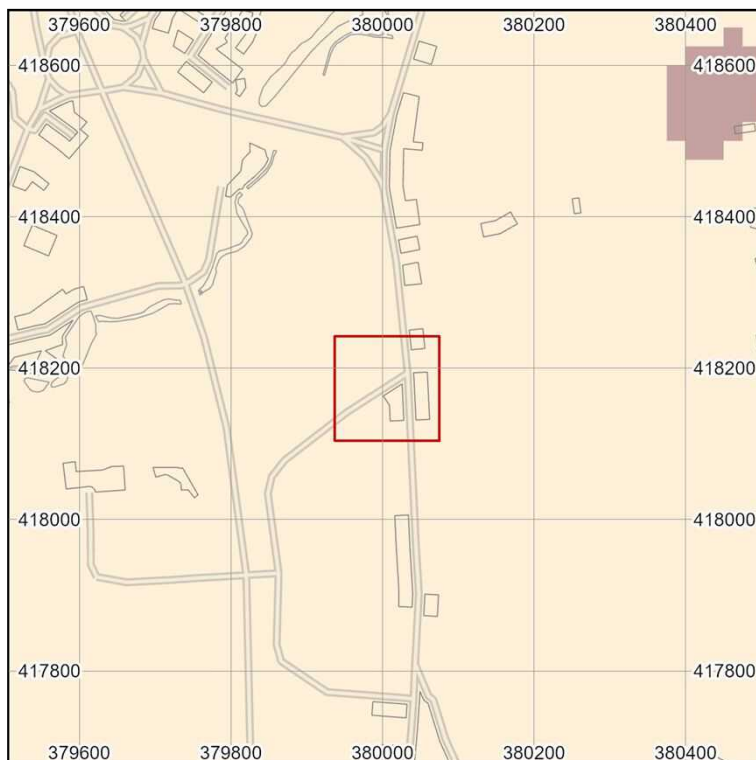
NO RADON PROTECTIVE MEASURES ARE REQUIRED FOR THE REPORT AREA.

More details of the protective measures required are available in *BR211 Radon: Guidance on protective measures for new buildings (2023 Edition)*.

Whether or not the radon level in a building is above or below the radon Action Level can only be established by having the building tested. The UKHSA provides a radon testing service which can be accessed at www.ukradon.org or by telephone (01235 822622).

If you require further information or guidance, you should contact your local authority building control officer or approved inspector.

Radon Affected Area



% Homes estimated to be at or above the action level
0-1%
1-3%
3-5%
5-10%
10-30%
30-100%

Contains OS data © Crown Copyright and database right 2025

Scale: 1:10 000 (1cm = 100 m)

Search area indicated in red

Is the property in a radon Affected Area as defined by the UK Health Security Agency (UKHSA) and if so what percentage of homes are estimated to be at or above the Action Level? NO

Additional Information

THE PROPERTY IS IN AN AREA WHERE LESS THAN 1% OF HOMES ARE ESTIMATED TO BE AT OR ABOVE THE ACTION LEVEL. THE PROPERTY IS NOT IN A RADON AFFECTED AREA.

The UKHSA recommends a radon 'Action Level' of 200 Becquerels per cubic metre of air (Bq m^{-3}) for the annual average of the radon gas concentration in a home. Where 1% or more of homes are estimated to be at or above the Action Level the area should be regarded as a radon Affected Area.

This report informs you whether the property is in a radon Affected Area and the percentage of homes that are estimated to be at or above the radon Action Level at this location. Being in an Affected Area does not necessarily mean there is a high radon level within the property; the only way to determine the radon level is to carry out a radon measurement.

The UKHSA advises that radon gas should be measured in all properties within radon Affected Areas and that homes with radon levels at or above the Action Level (200 Bq m⁻³) should be remediated. Householders with levels between the Target Level (100 Bq m⁻³) and Action Level should seriously consider reducing their radon level, especially if they are at greater risk, such as if they are current or ex smokers. Whether or not a home is in fact above or below the Action Level or Target Level can only be established by having the building tested. The UKHSA provides a validated radon testing service which can be accessed at www.ukradon.org.

The information in this report provides an answer to one of the standard legal enquiries on house purchase in England and Wales, known as Law Society CON29 Enquiries of the Local Authority (2016); 3.14 Radon Gas: Do records indicate that the property is in a “Radon Affected Area” as identified by the UKHSA. The data can also be used to advise house buyers and sellers in Scotland and Northern Ireland.

If you are buying a new build property in a Radon Affected Area, you should ask the builder whether radon protective measures were incorporated in the construction of the property.

If you are buying a currently occupied property in a radon Affected Area, you should ask the present owner whether radon levels have been measured in the property. If they have, ask whether the results were at or above the radon Action Level and if so, whether remedial measures were installed, radon levels were re-tested, and if the results of re-testing confirmed the effectiveness of the measures.

Further information on radon is available from the UKHSA at www.ukradon.org.

What is radon?

Radon is a naturally occurring radioactive gas, which is produced by the radioactive decay of radium which, in turn, is derived from the radioactive decay of uranium. Uranium is found in small quantities in all soils and rocks, although the amount varies from place to place. Radon released from rocks and soils is quickly diluted in the atmosphere. Concentrations in the open air are normally very low and do not present a hazard. Radon that enters enclosed spaces such as some buildings (particularly basements), caves, mines, and tunnels may reach high concentrations in some circumstances. The construction method and degree of ventilation will influence radon levels in individual buildings. A person's exposure to radon will also vary according to how particular buildings and spaces are used.

Inhalation of the radioactive decay products of radon gas increases the chance of developing lung cancer. If individuals are exposed to high concentrations for significant periods of time, there may be cause for concern. In order to limit the risk to individuals, the Government has adopted an Action Level for radon in homes of 200 becquerels per cubic metre (Bq m⁻³). The Government advises householders that, where the radon level is at or above the Action Level, measures should be taken to reduce the concentration.

Radon in workplaces

The Ionising Radiation Regulations 2017 require employers to take action when radon is present above a defined level in the workplace. Advice may be obtained from your local Health and Safety Executive Area Office or the Environmental Health Department of your local authority. The BRE publishes a guide (BR293): **Radon in the workplace**. BRE publications may be obtained from the BRE Bookshop, Tel: 01923 664262, email: bookshop@bre.co.uk website: www.brebookshop.com

Contact Details

Keyworth Office

British Geological Survey
Environmental Science Centre
Nicker Hill
Keyworth
Nottingham
NG12 5GG
Tel: 0115 9363100
Email: enquiries@bgs.ac.uk

Wallingford Office

British Geological Survey
Maclean Building
Wallingford
Oxford
OX10 8BB
Email: enquiries@bgs.ac.uk

Edinburgh Office

British Geological Survey
Lyell Centre
Research Avenue South
Edinburgh
EH14 4AP
Tel: 0131 6671000
Email: enquiry@bgs.ac.uk

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Appendix C

Profile Logs

Window Sample Logs
Hand Dug Pit Log
Dynamic Probe Logs

Excavation Method

Drive-in Windowless Sampler
driven to 3.575mbgl.

Dimensions
Ground Level (mOD)
Client

Steven Mort

Job
Number
LKC 21 1680

Location
Dates

02/03/2023

Engineer

LKC

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.30	ES PID<0.1ppm				(0.30)	MADE GROUND: Dark grey slightly silty SAND and GRAVEL predominantly comprising ash and clinker with occasional brick fragments and rare whole bricks. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded.			
0.30-0.75	ESB PID=2.4ppm				0.30 (0.45)				
0.75-1.00	ES PID=0.1ppm				0.75	MADE GROUND: Black with slight organic / solvent type odour organic slightly sandy SILT with frequent rootlets, occasional ash, clinker and whole bricks. Sand is fine to medium.			
0.75-1.00	PP 30.7kPa				(0.25)				
1.00-1.50	ES				1.00	Slightly organic and very slight odour between 0.30-0.75mbgl.			
1.00-1.60	PP 38.8kPa								
1.30-15.00	D				(0.95)	Firm consistency low strength slightly organic light grey and light brown slightly sandy silty CLAY with rare rootlets. Sand is fine to medium.			
1.60-1.80	PP 83.8kPa								
1.80-1.95	D				1.95	Firm becoming very stiff consistency low to high strength light grey and light brown mottled slightly gravelly very sandy silty CLAY with rare rootlets. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising sandstone.			
1.80-1.95	PP 142.2kPa				(0.55)	Slightly organic (slight organic odour) and low strength between 1.00-1.50mbgl. Stiff consistency and high strength from 1.60mbgl.			
2.50-3.00	D		Water strike(1) at 2.50m.		2.50	Very stiff consistency and orangish brown with light grey mottling from 1.80mbgl.			
2.50-2.95	SPT N=38		13,10/10,9,9,10		(0.50)				
3.00-3.20	D				3.00	Very light brown very gravelly SAND. Sand is fine to coarse (predominantly coarse). Gravel is fine to coarse, sub-angular to sub-rounded comprising sandstone. Possible highly weathered sandstone.			
3.20-3.58	SPT 50/225		7,7/9,9,32		(0.58)				
3.20-3.58	D				3.58	Dense gravelly slightly silty SAND. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising sandstone. Possible highly weathered sandstone. Strata is wet.			
						Extremely weak highly weathered light brown SANDSTONE recovered as sandy gravel.			
						Complete at 3.58m			

Remarks

Groundwater strike at 2.50mbgl.
Sampler refusal at 2.50mbgl. SPT driven to 2.95mbgl. Sampler driven overcore to 3.00mbgl.
SPT refusal at 3.575mbgl on extremely weak highly weathered sandstone.
Borehole stable.

Scale
(approx)

1:40

Logged
By

EM

Figure No.

LKC 21 1680.WS101

Excavation Method

Drive-in Windowless Sampler
driven to 2.70mbgl.

Dimensions
Ground Level (mOD)
Client

Steven Mort

Job
Number

LKC 21 1680

Location
Dates

02/03/2023

Engineer

LKC

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.05-0.80	ESB PID<0.1ppm				0.05	MADE GROUND: Grey sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising limestone.			
					(0.75)	MADE GROUND: Black gravelly SAND predominantly comprising ash with frequent clinker, occasional coal, clay lenses and rare brick fragments, becoming dark grey with depth. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded.			
0.80-1.00 0.80-1.10	PP 36.5kPa ES PID=0.1ppm		Torque at 1.00mbgl = 15kgm		0.80 (0.30)	Firm consistency low strength light orangish brown sandy silty CLAY. Sand is fine to medium.			
1.10-1.50 1.20-1.50	PP 115.7kPa D				1.10	Stiff becoming very stiff consistency high to very high strength orangish brown with occasional grey mottling slightly gravelly sandy CLAY with occasional coal fragments. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising sandstone and mudstone. High strength from 1.10mbgl. Very high strength between 1.50-2.00mbgl. Very stiff consistency and increasing gravel content from 1.60mbgl.			
1.50-2.00	PP 198.2kPa				(1.50)				
1.80-2.00	D								
2.00-2.50	PP 137.3kPa		Torque at 2.00mbgl = 30kgm						
2.30-2.50	D								
2.60-2.70	D		Water strike(1) at 2.50m.		2.60 (0.10)	Extremely weak highly weathered orange SANDSTONE recovered as sandy gravel.			
						Complete at 2.70m			

Remarks

Groundwater strike at 2.50mbgl.
Borehole stable.
Sampler refusal at 2.70mbgl on extremely weak highly weathered sandstone.
Dynamic Probing undertaken from surface, refer to separate output sheet (ref. DP101).
Dynamic probe refusal at 2.85mbgl.

Scale
(approx)

1:40

Logged
By

EM

Figure No.

LKC 21 1680.WS102

Excavation Method

Drive-in Windowless Sampler
driven to 3.60mbgl.

Dimensions
Ground Level (mOD)
Client

Steven Mort

Job
Number
LKC 21 1680

Location
Dates

02/03/2023

Engineer

LKC

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.20	ES PID<0.1ppm				(0.20)	MADE GROUND: Blackish brown gravelly silty SAND with frequent ash, clinker and occasional rootlets. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising limestone.			
0.20-1.20	ESB PID<0.1ppm				0.20	Frequent limestone gravel in upper 0.05m.			
			Torque at 1.00mbgl = 0kgm		(1.50)	MADE GROUND: Blackish brown gravelly slightly clayey SAND predominantly comprising ash with frequent clinker, occasional clay lenses, rare whole bricks, glass fragments, burnt shale and sub-angular sandstone cobbles. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded.			
			Torque at 1.50mbgl = 10kgm		1.70	Slight silty and no clay lenses present from 0.60mbgl.			
1.70-2.00	ES PID<0.1ppm		Water strike(1) at 2.00m.		(0.30)	MADE GROUND: Soft to firm consistency brown slightly sandy silty CLAY with frequent ash and occasional clinker. Sand is fine to medium.			
			Torque at 2.00mbgl = 15kgm		2.00	MADE GROUND: Dark grey clayey COBBLES with occasional ash and rare fire brick. Cobbles are sub-angular comprising sandstone. Approximately 20% recovery (probable cobble in base of sampler).			
					(1.00)				
			Torque at 3.00mbgl = 20kgm		3.00	MADE GROUND: Dark grey silty SAND with occasional ash and coal. Sand is fine to coarse. Strata is wet.			
3.20-3.40	D				(0.20)				
3.20-3.40	PP 32.7kPa				3.20				
					(0.25)				
3.45-3.60	D				3.45	Firm consistency low strength light brownish orange and light grey gravelly slightly sandy silty CLAY, becoming increasingly sandy and gravelly with depth. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising sandstone.			
					(0.15)				
					3.60	Extremely weak highly weathered light brown SANDSTONE recovered as sandy slightly clayey gravel (micaceous).			
						Complete at 3.60m			

Remarks

Dynamic probe refusal at 4.78mbgl.
Dynamic Probing undertaken from surface, refer to separate output sheet (ref. DP102).
Borehole stable.
Groundwater strike recorded at 2.00mbgl.
Approximately 20% recovery between 2.00-3.00mbgl as probable cobble in base of sampler.
Sampler refusal at 3.60mbgl on extremely weak highly weathered sandstone.

Scale
(approx)

1:40

Logged
By

EM

Figure No.

LKC 21 1680.WS103

Excavation Method

Drive-in Windowless Sampler
driven to 4.00mbgl.

Dimensions
Ground Level (mOD)
Client

Steven Mort

Job
Number
LKC 21 1680

Location
Dates

02/03/2023

Engineer

LKC

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.55	ES PID=0.1ppm				(0.55)	MADE GROUND: Blackish grey slightly gravelly very silty SAND with occasional rootlets, clinker, rare concrete cobbles, glass and brick fragments. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising sandstone.			
0.55-0.80	ES PID<0.1ppm				0.55 (0.25)	MADE GROUND: Dark brown very gravelly clayey SAND with rare rootlets, ash and brick fragments. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising sandstone.			
0.80-1.50	ES PID<0.1ppm		Torque at 1.00mbgl = 10kgm		0.80 (0.70)	MADE GROUND: Black slightly gravelly SAND predominantly comprising ash with occasional clinker. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded.			
					1.50	Predominantly fine ash between 1.00-1.50mbgl.			
2.00-3.00	ES PID=0.1ppm		Torque at 2.00mbgl = 20kgm		(1.50)	MADE GROUND: Brown gravelly SAND with frequent ash, occasional brick and glass fragments. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising sandstone. Strata is wet from 2.00mbgl.			
3.00-4.00	ES PID=0.4ppm		Water strike(1) at 3.00m. Torque at 3.00mbgl = 10kgm		3.00 (1.00)	MADE GROUND: Black slightly organic with slight hydrocarbon odour sandy SILT with frequent ash, occasional brick fragments and ash. Sand is fine to medium. Approximately 50% recovery. Very slight hydrocarbon sheen to water. Plastic and woven material membranes identified at 3.00mbgl.		√1	
					4.00	Terminated at 4.00m			

Remarks

Groundwater strike at 3.00mbgl.
Borehole stable.
Slight hydrocarbon odour and sheen between 3.00-4.00mbgl.
Approximately 50% recovery between 3.00-4.00mbgl.
Dynamic Probing undertaken from surface, refer to separate output sheet (ref. DP103).

Scale (approx)

1:40

Logged By

EM

Figure No.

LKC 21 1680.WS104

Excavation Method

Drive-in Windowless Sampler
driven to 5.45mbgl.

Dimensions
Ground Level (mOD)
Client

Steven Mort

Job
Number
LKC 21 1680

Location
Dates

02/03/2023

Engineer

LKC

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-0.40	ES PID<0.1ppm				(0.40)	MADE GROUND: Brown very silty SAND with occasional rootlets, rare brick fragments, whole bricks, coal and ash. Sand is fine to medium.			
0.40-1.00	ES PID<0.1ppm				0.40 (0.60) 1.00	MADE GROUND: Black SAND and GRAVEL predominantly comprising ash and clinker with occasional coal, brick fragments, rare whole bricks and concrete fragments. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded.			
1.20-1.65	SPT N=7		2,1/1,1,2,3		(1.00)	MADE GROUND: Dark brown SAND and GRAVEL with frequent ash, rare concrete cobbles and sub-angular sandstone cobbles. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising sandstone. Approximately 20% recovery.			
2.00-2.45	SPT N=1		1,0/1,0,0,0		2.00 (0.20) 2.20	MADE GROUND: Black SAND and GRAVEL predominantly comprising ash and clinker. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded.			
2.20-2.50	ES PID<0.1ppm				(0.80)	MADE GROUND: Firm consistency brown slightly sandy slightly gravelly silty CLAY with rare brick fragments. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising sandstone. Approximately 50% recovery between 2.00-3.00mbgl.			
3.00-4.00	ES PID<0.1ppm		Water strike(1) at 3.00m.		3.00	MADE GROUND: Grey gravelly very silty SAND with occasional clay lenses and rare brick fragments. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising sandstone. Strata is wet.			
3.00-3.45	SPT N=4		1,1/1,1,1,1		(1.20)				
4.00-4.45	SPT N=3		1,0/1,1,0,1		4.20	Soft consistency slightly organic grey slightly sandy SILT. Sand is fine to medium. Approximately 20% recovery between 4.00-5.00mbgl.			
4.20-5.00	ES PID<0.1ppm				(1.00)				
5.00-5.30	SPT 50/150 D		4,6/25,25		5.20 (0.10) (5.30)	Extremely weak highly weathered light brown SANDSTONE. Recovered as sandy gravel.			
5.00-5.30						Complete at 5.30m			

Remarks

Groundwater strike at 3.00mbgl. Rose to 2.00mbgl within approximately 30 minutes.
Borehole stable.
Approximately 20% recovery between 1.00-2.00mbgl.
Approximately 50% recovery between 2.00-3.00mbgl.
Approximately 20% recovery between 4.00-5.00mbgl.
SPT refusal at 5.30mbgl on extremely weak highly weathered sandstone.

Scale
(approx)

1:40

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Figure No.

LKC 21 1680.WS105

Excavation Method

Hand dug pit to 0.60mbgl.

Dimensions

0.20m x 0.20m x 0.60m

Ground Level (mOD)
Client

Steven Mort

**Job
Number**
LKC 21 1680

Location
Dates

02/03/2023

Engineer

LKC

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	ES PID<0.1ppm				(0.20)	MADE GROUND: Brown very silty SAND with frequent rootlets, ash and occasional clinker. Sand is fine to coarse.		
0.20-0.60	ES PID<0.1ppm				0.20	MADE GROUND: Black gravelly SAND predominantly comprising ash with occasional clinker, sub-angular sandstone cobbles and rare clay lenses. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded.		
					(0.40)	Firm consistency brown sandy CLAY in western wall of pit at 0.40mbgl.		
					0.60	Terminated at 0.60m		


Remarks

Hand auger refusal at 0.60mbgl on probable cobbles.
Pit dry and stable.
No access for window sample rig therefore hand dug pit undertaken.

Scale (approx)

1:20

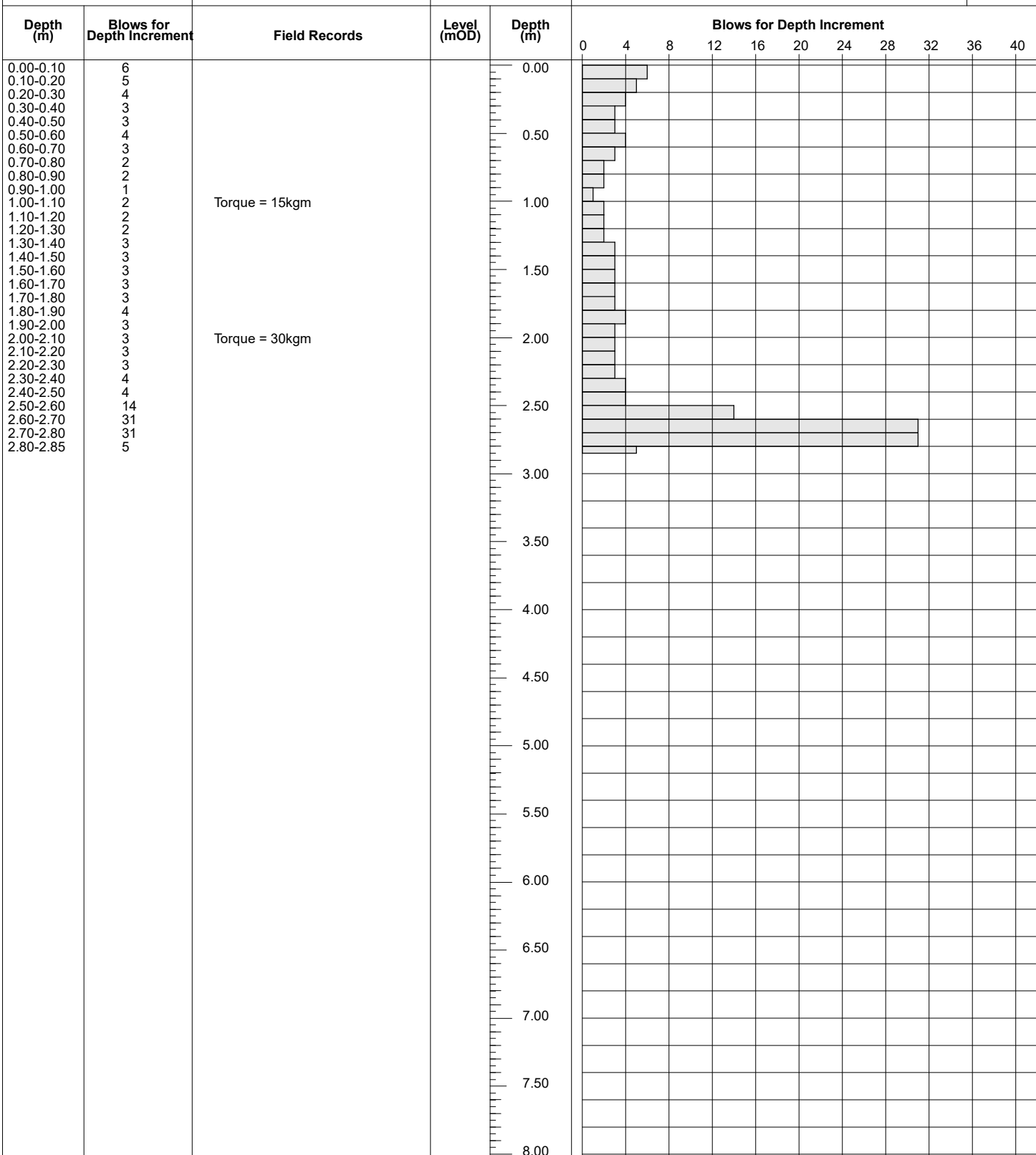
Logged By

EM

Figure No.

LKC 21 1680.HD101

Method Dynamic Probing	Cone Dimensions	Ground Level (mOD)	Client Steven Mort	Job Number LKC 21 1680
	Location	Dates 02/03/2023	Engineer LKC	Sheet 1/1


Remarks

Please refer to soil description in WS102. Sampler refusal at 2.70mbgl in extremely weak highly weathered sandstone. Dynamic probe refusal at 2.85mbgl.
Groundwater strike recorded at 2.50mbgl.

Scale (approx)	Logged By
1:40	EM
Figure No.	
LKC 21 1680.DP101	

**LK CONSULT LTD**Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS
Tel: 0161 763 7200 web: www.thelkgroup.com**Site**

Whalley Road, Ramsbottom

**Probe
Number****DP102**

Method Dynamic Probing	Cone Dimensions	Ground Level (mOD)	Client Steven Mort	Job Number LKC 21 1680
	Location	Dates 02/03/2023	Engineer LKC	Sheet 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)	Blows for Depth Increment															
					0	2	4	6	8	10	12	14	16	18	20					
0.00-0.10	2	Torque = 0kgm		0.00																
0.10-0.20	2																			
0.20-0.30	3																			
0.30-0.40	1																			
0.40-0.50	1																			
0.50-0.60	1			0.50																
0.60-0.70	1																			
0.70-0.80	1																			
0.80-0.90	1																			
0.90-1.00	1																			
1.00-1.10	0	Torque = 10kgm	1.00																	
1.10-1.20	0																			
1.20-1.30	0																			
1.30-1.40	1																			
1.40-1.50	1																			
1.50-1.60	1			1.50																
1.60-1.70	1																			
1.70-1.80	1																			
1.80-1.90	1																			
1.90-2.00	1		Torque = 15kgm	2.00																
2.00-2.10	0																			
2.10-2.20	0																			
2.20-2.30	0																			
2.30-2.40	2																			
2.40-2.50	1																			
2.50-2.60	2			2.50																
2.60-2.70	4																			
2.70-2.80	2																			
2.80-2.90	1	Torque = 20kgm																		
2.90-3.00	1																			
3.00-3.10	2			3.00																
3.10-3.20	2																			
3.20-3.30	6																			
3.30-3.40	5																			
3.40-3.50	8																			
3.50-3.60	9			3.50																
3.60-3.70	9																			
3.70-3.80	19		Torque = 30kgm																	
3.80-3.90	12																			
3.90-4.00	10			4.00																
4.00-4.10	8																			
4.10-4.20	12																			
4.20-4.30	12																			
4.30-4.40	15																			
4.40-4.50	16			4.50																
4.50-4.60	16																			
4.60-4.70	16																			
4.70-4.78	18																			
				5.00																
				5.50																
				6.00																
				6.50																
				7.00																
				7.50																
				8.00																

Remarks

Please refer to soil description in WS103. Sampler refusal at 3.60mbgl in extremely weak highly weathered sandstone. Dynamic probe refusal at 4.78mbgl. Groundwater strike recorded at 2.00mbgl.

Scale (approx)	Logged By
1:40	EM
Figure No.	
LKC 21 1680.DP102	

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)	Blows for Depth Increment
0.00-0.10	2			0.00	2
0.10-0.20	3				3
0.20-0.30	3				3
0.30-0.40	3				3
0.40-0.50	3				3
0.50-0.60	4			0.50	4
0.60-0.70	4				4
0.70-0.80	5				5
0.80-0.90	7				7
0.90-1.00	5				5
1.00-1.10	3	Torque = 10kgm		1.00	3
1.10-1.20	1				1
1.20-1.30	0				0
1.30-1.40	1				1
1.40-1.50	0				0
1.50-1.60	1			1.50	1
1.60-1.70	1				1
1.70-1.80	0				0
1.80-1.90	1				1
1.90-2.00	1				1
2.00-2.10	1	Torque = 20kgm		2.00	1
2.10-2.20	2				2
2.20-2.30	0				0
2.30-2.40	1				1
2.40-2.50	1				1
2.50-2.60	1			2.50	1
2.60-2.70	1				1
2.70-2.80	1				1
2.80-2.90	1				1
2.90-3.00	1				1
3.00-3.10	0	Torque = 10kgm		3.00	0
3.10-3.20	1				1
3.20-3.30	1				1
3.30-3.40	1				1
3.40-3.50	1				1
3.50-3.60	1				1
3.60-3.70	1			3.50	1
3.70-3.80	3				3
3.80-3.90	2				2
3.90-4.00	1				1
4.00-4.10	2	Torque = 25kgm		4.00	2
4.10-4.20	1				1
4.20-4.30	1				1
4.30-4.40	0				0
4.40-4.50	0				0
4.50-4.60	1			4.50	1
4.60-4.70	3				3
4.70-4.80	4				4
4.80-4.90	8				8
4.90-5.00	13				13
5.00-5.10	6	Torque = 30kgm		5.00	6
5.10-5.20	4				4
5.20-5.30	2				2
5.30-5.40	2				2
5.40-5.50	1				1
5.50-5.60	2			5.50	2
5.60-5.70	1				1
5.70-5.80	1				1
5.80-5.90	1				1
5.90-6.00	4				4
6.00-6.10	4	Torque = 40kgm		6.00	4
6.10-6.20	1				1
6.20-6.30	2				2
6.30-6.40	18				18
6.40-6.44	32			6.50	32
				7.00	
				7.50	
				8.00	

LKC 21 1680.DP103

Appendix D

Certificates of Analysis – Soil



Emma Khadun
LK Consult Limited
Unit 29 Eton Business Park
Eton Hill Road
Manchester
M26 2ZS

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 23-03215

Site Reference: Whalley Road, Ramsbottom

Project / Job Ref: LKC 21 1680

Order No: LKC 21 1680-B1-EK

Sample Receipt Date: 08/03/2023

Sample Scheduled Date: 08/03/2023

Report Issue Number: 1

Reporting Date: 17/03/2023

Authorised by:

Kevin Old
Operations Director

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. 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 except in full, without the prior written approval of the laboratory.

For Topsoil and WAC analysis the expanded uncertainty measurement should be considered while evaluating results against compliance values.



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate						
DETS Report No: 23-03215	Date Sampled	02/03/23	02/03/23	02/03/23	02/03/23	02/03/23
LK Consult Limited	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Whalley Road, Ramsbottom	TP / BH No	HD101	WS101	WS101	WS101	WS102
Project / Job Ref: LKC 21 1680	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: LKC 21 1680-B1-EK	Depth (m)	0.00 - 0.20	0.30 - 0.75	0.75 - 1.00	2.50 - 3.00	0.05 - 0.80
Reporting Date: 17/03/2023	DETS Sample No	639435	639436	639437	639438	639439

Determinand	Unit	RL	Accreditation					
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Detected	Not Detected	Not Detected		Not Detected
Sample Matrix ^(S)	Material Type	N/a	NONE	Amosite present as bundles				
Asbestos Type ^(S)	PLM Result	N/a	ISO17025	Amosite				
Asbestos Quantification ^(S)	%	< 0.001	ISO17025	< 0.001				
pH	pH Units	N/a	MCERTS	7.9	7.6	7.3	7.1	7.3
Total Cyanide	mg/kg	< 1	NONE		61	< 1		< 1
Free Cyanide	mg/kg	< 1	NONE		< 1	< 1		< 1
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	46	668	34	19	153
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.05	0.67	0.03	0.02	0.15
Organic Matter (SOM)	%	< 0.1	MCERTS	11.9	25.4	2.2		12.4
W/S Chloride (2:1)	mg/kg	< 1	MCERTS				11	
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS				5.5	
Water Soluble Nitrate (2:1) as NO ₃	mg/kg	< 3	MCERTS				< 3	
Water Soluble Nitrate (2:1) as NO ₃	mg/l	< 1.5	MCERTS				< 1.5	
Arsenic (As)	mg/kg	< 2	MCERTS	59	23	8		27
W/S Boron	mg/kg	< 1	NONE		< 1	< 1		< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.7	2.6	< 0.2		0.8
Chromium (Cr)	mg/kg	< 2	MCERTS	100	7270	62		284
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2		< 2
Copper (Cu)	mg/kg	< 4	MCERTS	174	894	16		100
Lead (Pb)	mg/kg	< 3	MCERTS	195	730	22		248
W/S Magnesium	mg/l	< 0.1	NONE				1.2	
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1		< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	36	25	12		24
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2		< 2
Vanadium (V)	mg/kg	< 1	MCERTS	170	48	28		37
Zinc (Zn)	mg/kg	< 3	MCERTS	158	676	41		125
Total Phenols (monohydric)	mg/kg	< 2	NONE		7.2	< 2		< 2

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion

Subcontracted analysis (S)

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate						
DETS Report No: 23-03215	Date Sampled	02/03/23	02/03/23	02/03/23	02/03/23	02/03/23
LK Consult Limited	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Whalley Road, Ramsbottom	TP / BH No	WS102	WS103	WS103	WS104	WS104
Project / Job Ref: LKC 21 1680	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: LKC 21 1680-B1-EK	Depth (m)	0.80 - 1.10	0.20 - 1.20	1.70 - 2.00	0.00 - 0.55	0.80 - 1.50
Reporting Date: 17/03/2023	DETS Sample No	639440	639441	639442	639443	639444

Determinand	Unit	RL	Accreditation	(n)				
Asbestos Screen ^(S)	N/a	N/a	ISO17025		Not Detected	Not Detected	Not Detected	Not Detected
Sample Matrix ^(S)	Material Type	N/a	NONE					
Asbestos Type ^(S)	PLM Result	N/a	ISO17025					
Asbestos Quantification ^(S)	%	< 0.001	ISO17025					
pH	pH Units	N/a	MCERTS	7.0	7.2	7.5	7.4	7.0
Total Cyanide	mg/kg	< 1	NONE					
Free Cyanide	mg/kg	< 1	NONE					
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	21	27	21	18	26
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.02	0.03	0.02	0.02	0.03
Organic Matter (SOM)	%	< 0.1	MCERTS		12.4	12.2	12.1	30.3
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	11	8			
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS	5.3	4.2			
Water Soluble Nitrate (2:1) as NO ₃	mg/kg	< 3	MCERTS	5	8			
Water Soluble Nitrate (2:1) as NO ₃	mg/l	< 1.5	MCERTS	2.7	4			
Arsenic (As)	mg/kg	< 2	MCERTS		58	27	24	186
W/S Boron	mg/kg	< 1	NONE					
Cadmium (Cd)	mg/kg	< 0.2	MCERTS		0.8	1.2	0.6	1.2
Chromium (Cr)	mg/kg	< 2	MCERTS		42	44	90	36
Chromium (hexavalent)	mg/kg	< 2	NONE		< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS		137	93	103	198
Lead (Pb)	mg/kg	< 3	MCERTS		146	104	174	141
W/S Magnesium	mg/l	< 0.1	NONE	0.9	1.6			
Mercury (Hg)	mg/kg	< 1	MCERTS		< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS		39	33	34	53
Selenium (Se)	mg/kg	< 2	MCERTS		< 2	< 2	< 2	< 2
Vanadium (V)	mg/kg	< 1	MCERTS		73	41	67	124
Zinc (Zn)	mg/kg	< 3	MCERTS		157	493	129	92
Total Phenols (monohydric)	mg/kg	< 2	NONE					

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate						
DETS Report No: 23-03215	Date Sampled	02/03/23	02/03/23	02/03/23		
LK Consult Limited	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Whalley Road, Ramsbottom	TP / BH No	WS104	WS105	WS105		
Project / Job Ref: LKC 21 1680	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: LKC 21 1680-B1-EK	Depth (m)	3.00 - 4.00	3.00 - 4.00	4.20 - 5.00		
Reporting Date: 17/03/2023	DETS Sample No	639445	639447	639448		

Determinand	Unit	RL	Accreditation	(n)			
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Detected	Detected		
Sample Matrix ^(S)	Material Type	N/a	NONE	Chrysotile present in bundles	Chrysotile present in bundles		
Asbestos Type ^(S)	PLM Result	N/a	ISO17025	Chrysotile	Chrysotile		
Asbestos Quantification ^(S)	%	< 0.001	ISO17025	< 0.001	< 0.001		
pH	pH Units	N/a	MCERTS	7.2	7.8	7.1	
Total Cyanide	mg/kg	< 1	NONE	8			
Free Cyanide	mg/kg	< 1	NONE	< 1			
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	314	58	28	
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.31	0.06	0.03	
Organic Matter (SOM)	%	< 0.1	MCERTS	26.7	0.3		
W/S Chloride (2:1)	mg/kg	< 1	MCERTS			14	
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS			7	
Water Soluble Nitrate (2:1) as NO ₃	mg/kg	< 3	MCERTS			< 3	
Water Soluble Nitrate (2:1) as NO ₃	mg/l	< 1.5	MCERTS			< 1.5	
Arsenic (As)	mg/kg	< 2	MCERTS	140	47		
W/S Boron	mg/kg	< 1	NONE	1.1			
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	4.4	0.8		
Chromium (Cr)	mg/kg	< 2	MCERTS	3040	259		
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2		
Copper (Cu)	mg/kg	< 4	MCERTS	756	77		
Lead (Pb)	mg/kg	< 3	MCERTS	656	453		
W/S Magnesium	mg/l	< 0.1	NONE			1.2	
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1		
Nickel (Ni)	mg/kg	< 3	MCERTS	124	32		
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2		
Vanadium (V)	mg/kg	< 1	MCERTS	380	48		
Zinc (Zn)	mg/kg	< 3	MCERTS	621	151		
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
 Subcontracted analysis (S)



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 23-03215	Date Sampled	02/03/23	02/03/23	02/03/23	02/03/23	02/03/23
LK Consult Limited	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Whalley Road, Ramsbottom	TP / BH No	HD101	WS101	WS101	WS102	WS103
Project / Job Ref: LKC 21 1680	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: LKC 21 1680-B1-EK	Depth (m)	0.00 - 0.20	0.30 - 0.75	0.75 - 1.00	0.05 - 0.80	0.20 - 1.20
Reporting Date: 17/03/2023	DETS Sample No	639435	639436	639437	639439	639441

Determinand	Unit	RL	Accreditation	(n)				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	0.33	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	1.15	< 0.1	0.63	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	0.76	< 0.1	0.47	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	0.60	5.60	< 0.1	5.76	0.77
Anthracene	mg/kg	< 0.1	MCERTS	0.15	2.12	< 0.1	1.12	0.17
Fluoranthene	mg/kg	< 0.1	MCERTS	1.45	6.86	0.13	9.41	1.88
Pyrene	mg/kg	< 0.1	MCERTS	1.34	5.83	< 0.1	8.17	1.67
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.82	2.10	< 0.1	3.56	0.92
Chrysene	mg/kg	< 0.1	MCERTS	0.78	2.07	< 0.1	3.50	0.89
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	1.35	1.81	< 0.1	3.94	1.24
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.48	0.51	< 0.1	1.33	0.37
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	1.30	1.43	< 0.1	3.50	1.06
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.70	0.41	< 0.1	2.03	0.87
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.32	0.13
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.48	0.30	< 0.1	1.30	0.59
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	9.4	31.3	< 1.6	45	10.6

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 23-03215	Date Sampled	02/03/23	02/03/23	02/03/23	02/03/23	02/03/23
LK Consult Limited	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Whalley Road, Ramsbottom	TP / BH No	WS103	WS104	WS104	WS104	WS105
Project / Job Ref: LKC 21 1680	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: LKC 21 1680-B1-EK	Depth (m)	1.70 - 2.00	0.00 - 0.55	0.80 - 1.50	3.00 - 4.00	3.00 - 4.00
Reporting Date: 17/03/2023	DETS Sample No	639442	639443	639444	639445	639447

Determinand	Unit	RL	Accreditation	(n)				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	0.14	0.24	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	0.44	0.61	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	0.25	0.42	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	3.43	5	0.61	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.66	1.51	0.52	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	0.14	6.25	11.10	0.88	0.15
Pyrene	mg/kg	< 0.1	MCERTS	0.13	5.65	10.40	0.78	0.12
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	2.79	5.25	0.35	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	2.89	4.58	0.35	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	3.40	5.23	0.37	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	1.24	2.02	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	3.10	5.03	0.28	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	2.14	2.51	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.34	0.37	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	1.38	1.72	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	34.1	56	4.1	< 1.6



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 23-03215	Date Sampled	02/03/23	02/03/23	02/03/23	02/03/23
LK Consult Limited	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Whalley Road, Ramsbottom	TP / BH No	WS101	WS101	WS102	WS104
Project / Job Ref: LKC 21 1680	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied
Order No: LKC 21 1680-B1-EK	Depth (m)	0.30 - 0.75	0.75 - 1.00	0.05 - 0.80	3.00 - 4.00
Reporting Date: 17/03/2023	DETS Sample No	639436	639437	639439	639445

Determinand	Unit	RL	Accreditation				
Aliphatic >C5 - C6 : HS_1D_MS_AL	mg/kg	< 0.01	NONE	< 0.01	< 0.01		< 0.01
Aliphatic >C6 - C8 : HS_1D_MS_AL	mg/kg	< 0.05	NONE	< 0.05	< 0.05		< 0.05
Aliphatic >C8 - C10 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	10	< 2		< 2
Aliphatic >C10 - C12 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	6	< 2		< 2
Aliphatic >C12 - C16 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	6	< 3		< 3
Aliphatic >C16 - C21 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	94	< 3		< 3
Aliphatic >C21 - C34 : EH_CU_1D_AL	mg/kg	< 10	MCERTS	309	< 10		< 10
Aliphatic (C5 - C34) : HS_1D_MS+EH_CU_1D_AL	mg/kg	< 21	NONE	424	< 21		< 21
Aromatic >C5 - C7 : HS_1D_MS_AR	mg/kg	< 0.01	NONE	< 0.01	< 0.01		< 0.01
Aromatic >C7 - C8 : HS_1D_MS_AR	mg/kg	< 0.05	NONE	0.06	< 0.05		< 0.05
Aromatic >C8 - C10 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2		< 2
Aromatic >C10 - C12 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2		< 2
Aromatic >C12 - C16 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	13	< 2		< 2
Aromatic >C16 - C21 : EH_CU_1D_AR	mg/kg	< 3	MCERTS	115	< 3		20
Aromatic >C21 - C35 : EH_CU_1D_AR	mg/kg	< 10	MCERTS	212	< 10		41
Aromatic (C5 - C35) : HS_1D_MS+EH_CU_1D_AR	mg/kg	< 21	NONE	341	< 21		60
Total >C5 - C35 : HS_1D_MS+EH_CU_1D_Tot al	mg/kg	< 42	NONE	765	< 42		60



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - TPH LQM Banded

DETS Report No: 23-03215	Date Sampled	02/03/23				
LK Consult Limited	Time Sampled	None Supplied				
Site Reference: Whalley Road, Ramsbottom	TP / BH No	WS102				
Project / Job Ref: LKC 21 1680	Additional Refs	None Supplied				
Order No: LKC 21 1680-B1-EK	Depth (m)	0.05 - 0.80				
Reporting Date: 17/03/2023	DETS Sample No	639439				

Determinand	Unit	RL	Accreditation				
Aliphatic >C5 - C6 : HS_1D_MS_AL	mg/kg	< 0.01	NONE	< 0.01			
Aliphatic >C6 - C8 : HS_1D_MS_AL	mg/kg	< 0.05	NONE	< 0.05			
Aliphatic >C8 - C10 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	< 2			
Aliphatic >C10 - C12 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	< 2			
Aliphatic >C12 - C16 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	< 3			
Aliphatic >C16 - C35 : EH_CU_1D_AL	mg/kg	< 10	MCERTS	< 10			
Aliphatic >C35 - C44 : EH_CU_1D_AL	mg/kg	< 10	NONE	< 10			
Aliphatic (C5 - C44) : HS_1D_MS+EH_CU_1D_AL	mg/kg	< 30	NONE	< 30			
Aromatic >C5 - C7 : HS_1D_MS_AR	mg/kg	< 0.01	NONE	< 0.01			
Aromatic >C7 - C8 : HS_1D_MS_AR	mg/kg	< 0.05	NONE	< 0.05			
Aromatic >C8 - C10 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2			
Aromatic >C10 - C12 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2			
Aromatic >C12 - C16 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	4			
Aromatic >C16 - C21 : EH_CU_1D_AR	mg/kg	< 3	MCERTS	37			
Aromatic >C21 - C35 : EH_CU_1D_AR	mg/kg	< 10	MCERTS	47			
Aromatic >C35 - C44 : EH_CU_1D_AR	mg/kg	< 10	NONE	< 10			
Aromatic (>C5 - C44) : HS_1D_MS+EH_CU_1D_AR	mg/kg	< 30	NONE	88			
Total >C5 - C44 : HS_1D_MS+EH_CU_1D_Tot al	mg/kg	< 60	NONE	88			



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 23-03215	Date Sampled	02/03/23	02/03/23	02/03/23	02/03/23	
LK Consult Limited	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Whalley Road, Ramsbottom	TP / BH No	WS101	WS101	WS102	WS104	
Project / Job Ref: LKC 21 1680	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	
Order No: LKC 21 1680-B1-EK	Depth (m)	0.30 - 0.75	0.75 - 1.00	0.05 - 0.80	3.00 - 4.00	
Reporting Date: 17/03/2023	DETS Sample No	639436	639437	639439	639445	

Determinand	Unit	RL	Accreditation					
Benzene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
Toluene : HS_1D_MS	ug/kg	< 5	MCERTS	59	< 5	< 5	< 5	
Ethylbenzene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
p & m-xylene : HS_1D_MS	ug/kg	< 2	MCERTS	44	< 2	< 2	24	
o-xylene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
MTBE : HS_1D_MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	



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Rose Lane
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Maidstone
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Soil Analysis Certificate - Volatile Organic Compounds (VOC)						
DETS Report No: 23-03215	Date Sampled	02/03/23	02/03/23	02/03/23		
LK Consult Limited	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Whalley Road, Ramsbottom	TP / BH No	WS101	WS101	WS104		
Project / Job Ref: LKC 21 1680	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: LKC 21 1680-B1-EK	Depth (m)	0.30 - 0.75	0.75 - 1.00	3.00 - 4.00		
Reporting Date: 17/03/2023	DETS Sample No	639436	639437	639445		

Determinand	Unit	RL	Accreditation				
Dichlorodifluoromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Vinyl Chloride	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Chloromethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	
Chloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Bromomethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	
Trichlorofluoromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,1-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
trans-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,1-Dichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
cis-1,2-Dichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
2,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Chloroform	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Bromochloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,1,1-Trichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,1-Dichloropropene	ug/kg	< 10	MCERTS	< 10	< 10	< 10	
Carbon Tetrachloride	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,2-Dichloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	
1,2-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Trichloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Bromodichloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Dibromomethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
TAME	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
cis-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Toluene	ug/kg	< 5	MCERTS	59	< 5	< 5	
trans-1,3-Dichloropropene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,1,2-Trichloroethane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	
1,3-Dichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Tetrachloroethene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Dibromochloromethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,2-Dibromoethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Chlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,1,1,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Ethyl Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	
m,p-Xylene	ug/kg	< 2	MCERTS	44	< 2	24	
o-Xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	
Styrene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Bromoform	ug/kg	< 10	MCERTS	< 10	< 10	< 10	
Isopropylbenzene	ug/kg	< 5	MCERTS	75	< 5	< 5	
1,1,2,2-Tetrachloroethane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,2,3-Trichloropropane	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
n-Propylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
Bromobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
2-Chlorotoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,3,5-Trimethylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
4-Chlorotoluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
tert-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,2,4-Trimethylbenzene	ug/kg	< 5	MCERTS	44	< 5	< 5	
sec-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
p-Isopropyltoluene	ug/kg	< 5	MCERTS	110	< 5	< 5	
1,3-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,4-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
n-Butylbenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,2-Dichlorobenzene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	
1,2-Dibromo-3-chloropropane	ug/kg	< 10	MCERTS	< 10	< 10	< 10	
Hexachlorobutadiene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - Semi Volatile Organic Compounds (SVOC)						
DETS Report No: 23-03215	Date Sampled	02/03/23	02/03/23	02/03/23		
LK Consult Limited	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Whalley Road, Ramsbottom	TP / BH No	WS101	WS101	WS104		
Project / Job Ref: LKC 21 1680	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: LKC 21 1680-B1-EK	Depth (m)	0.30 - 0.75	0.75 - 1.00	3.00 - 4.00		
Reporting Date: 17/03/2023	DETS Sample No	639436	639437	639445		

Determinand	Unit	RL	Accreditation				
Phenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
1,2,4-Trichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	
2-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
Nitrobenzene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
0-Cresol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
bis(2-chloroethoxy)methane	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
bis(2-chloroethyl)ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
2,4-Dichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
2-Chlorophenol	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	
1,3-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	
1,4-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	
1,2-Dichlorobenzene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	
2,4-Dimethylphenol	mg/kg	< 0.15	ISO17025	< 0.15	< 0.15	< 0.15	
Isophorone	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
Hexachloroethane	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
p-Cresol	mg/kg	< 0.15	MCERTS	1.28	< 0.15	< 0.15	
2,4,6-Trichlorophenol	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
2,4,5-Trichlorophenol	mg/kg	< 0.15	MCERTS	< 0.15	< 0.15	< 0.15	
2-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
4-Chloro-3-methylphenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
2-Methylnaphthalene	mg/kg	< 0.1	MCERTS	0.4	< 0.1	< 0.1	
Hexachlorocyclopentadiene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
Hexachlorobutadiene	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	
2,6-Dinitrotoluene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Dimethyl phthalate	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
2-Chloronaphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
4-Chloroaniline	mg/kg	< 0.15	NONE	< 0.15	< 0.15	< 0.15	
4-Nitrophenol	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
4-Chlorophenyl phenyl ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
3-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
4-Nitroaniline	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
4-Bromophenyl phenyl ether	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Hexachlorobenzene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
2,4-Dinitrotoluene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Diethyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Dibenzofuran	mg/kg	< 0.1	MCERTS	0.5	< 0.1	< 0.1	
Azobenzene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1	
Dibutyl phthalate	mg/kg	< 0.1	ISO17025	< 0.1	< 0.1	< 0.1	
Carbazole	mg/kg	< 0.1	ISO17025	0.7	< 0.1	< 0.1	
bis(2-ethylhexyl)phthalate	mg/kg	< 0.15	ISO17025	< 0.15	< 0.15	< 0.15	
Benzyl butyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	
Di-n-octyl phthalate	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	



DETS Ltd
L, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Waste Acceptance Criteria Analytical Certificate - BS EN 12457/3																																							
DETS Report No: 23-03215		Date Sampled	02/03/23			<table border="1"> <thead> <tr> <th colspan="3">Landfill Waste Acceptance Criteria Limits</th> </tr> <tr> <th>Inert Waste Landfill</th> <th>Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill</th> <th>Hazardous Waste Landfill</th> </tr> </thead> <tbody> <tr> <td>3%</td> <td>5%</td> <td>6%</td> </tr> <tr> <td>--</td> <td>--</td> <td>10%</td> </tr> <tr> <td>6</td> <td>--</td> <td>--</td> </tr> <tr> <td>1</td> <td>--</td> <td>--</td> </tr> <tr> <td>500</td> <td>--</td> <td>--</td> </tr> <tr> <td>100</td> <td>--</td> <td>--</td> </tr> <tr> <td>--</td> <td>>6</td> <td>--</td> </tr> <tr> <td>--</td> <td>To be evaluated</td> <td>To be evaluated</td> </tr> </tbody> </table>				Landfill Waste Acceptance Criteria Limits			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	3%	5%	6%	--	--	10%	6	--	--	1	--	--	500	--	--	100	--	--	--	>6	--	--	To be evaluated	To be evaluated
Landfill Waste Acceptance Criteria Limits																																							
Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill																																					
3%	5%	6%																																					
--	--	10%																																					
6	--	--																																					
1	--	--																																					
500	--	--																																					
100	--	--																																					
--	>6	--																																					
--	To be evaluated	To be evaluated																																					
LK Consult Limited		Time Sampled	None Supplied																																				
Site Reference: Whalley Road, Ramsbottom		TP / BH No	WS102																																				
Project / Job Ref: LKC 21 1680		Additional Refs	None Supplied																																				
Order No: LKC 21 1680-B1-EK		Depth (m)	0.05 - 0.80																																				
Reporting Date: 17/03/2023		DETS Sample No	639439																																				
Determinand	Unit	MDL																																					
TOC ^{MU}	%	< 0.1	7.2																																				
Loss on Ignition ^{MU}	%	< 0.01	9.40																																				
BTEX ^{MU}	mg/kg	< 0.05	< 0.05																																				
Sum of PCBs	mg/kg	< 0.1	< 0.1																																				
Mineral Oil ^{MU}	mg/kg	< 10	< 10																																				
Total PAH ^{MU}	mg/kg	< 1.7	45.7																																				
pH ^{MU}	pH Units	N/a	7.3																																				
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	< 1																																				
Eluate Analysis			2:1 mg/l	8:1 mg/l		Cumulative 10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)																																
Arsenic ^U		< 0.01	< 0.01		< 0.2	0.5	2	25																															
Barium ^U		0.05	0.06		0.6	20	100	300																															
Cadmium ^U		< 0.0005	0.0006		< 0.02	0.04	1	5																															
Chromium ^U		< 0.005	< 0.005		< 0.20	0.5	10	70																															
Copper ^U		< 0.01	< 0.01		< 0.5	2	50	100																															
Mercury ^U		< 0.0005	< 0.0005		< 0.005	0.01	0.2	2																															
Molybdenum ^U		0.016	0.013		0.1	0.5	10	30																															
Nickel ^U		< 0.007	< 0.007		< 0.2	0.4	10	40																															
Lead ^U		< 0.005	< 0.005		< 0.2	0.5	10	50																															
Antimony ^U		0.006	< 0.005		< 0.05	0.06	0.7	5																															
Selenium ^U		< 0.005	< 0.005		< 0.05	0.1	0.5	7																															
Zinc ^U		< 0.005	0.006		< 0.2	4	50	200																															
Chloride ^U		4	2		26	800	15000	25000																															
Fluoride ^U		< 0.5	< 0.5		< 1	10	150	500																															
Sulphate ^U		63	29		329	1000	20000	50000																															
TDS		198	141		1470	4000	60000	100000																															
Phenol Index		< 0.01	< 0.01		< 0.5	1	-	-																															
DOC		11.1	13.8		136	500	800	1000																															
Leach Test Information																																							
Sample Mass (kg)			0.22																																				
Dry Matter (%)			81.4																																				
Moisture (%)			23																																				
Stage 1																																							
Volume Eluate L2 (litres)			0.31																																				
Filtered Eluate VE1 (litres)			0.19																																				

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
 Stated limits are for guidance only and DETS Ltd cannot be held responsible for any discrepancies with current legislation
 M Denotes MCERTS accredited test
 U Denotes ISO17025 accredited test



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - Sample Descriptions

DETS Report No: 23-03215

LK Consult Limited

Site Reference: Whalley Road, Ramsbottom

Project / Job Ref: LKC 21 1680

Order No: LKC 21 1680-B1-EK

Reporting Date: 17/03/2023

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
639435	HD101	None Supplied	0.00 - 0.20	18	Black loamy sand with stones
639436	WS101	None Supplied	0.30 - 0.75	35.8	Black sandy clay with stones
639437	WS101	None Supplied	0.75 - 1.00	21	Brown sandy clay
639438	WS101	None Supplied	2.50 - 3.00	11.9	Brown sandy clay with stones
639439	WS102	None Supplied	0.05 - 0.80	18.6	Black sandy clay with stones
639440	WS102	None Supplied	0.80 - 1.10	14.8	Light brown sandy clay
639441	WS103	None Supplied	0.20 - 1.20	17	Black sandy gravel with stones and concrete
639442	WS103	None Supplied	1.70 - 2.00	23.3	Black sandy clay with stones
639443	WS104	None Supplied	0.00 - 0.55	12	Black sandy clay with stones and concrete
639444	WS104	None Supplied	0.80 - 1.50	33.1	Black loamy sand with stones
639445	WS104	None Supplied	3.00 - 4.00	34.9	Black sandy clay with stones
639447	WS105	None Supplied	3.00 - 4.00	19.8	Black sludge with stones
639448	WS105	None Supplied	4.20 - 5.00	18.5	Brown sandy clay with stones

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{1/5}

Unsuitable Sample ^{4/5}



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - Methodology & Miscellaneous Information	
DETS Report No: 23-03215	
LK Consult Limited	
Site Reference: Whalley Road, Ramsbottom	
Project / Job Ref: LKC 21 1680	
Order No: LKC 21 1680-B1-EK	
Reporting Date: 17/03/2023	

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Water Analysis Certificate - Methodology & Miscellaneous Information	
DETS Report No: 23-03215	
LK Consult Limited	
Site Reference: Whalley Road, Ramsbottom	
Project / Job Ref: LKC 21 1680	
Order No: LKC 21 1680-B1-EK	
Reporting Date: 17/03/2023	

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	F	Ammoniacal Nitrogen	Determination of ammoniacal nitrogen by discrete analyser.	E126
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR dete	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GI-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



List of HWOL Acronyms and Operators

DETS Report No: 23-03215

LK Consult Limited

Site Reference: Whalley Road, Ramsbottom

Project / Job Ref: LKC 21 1680

Order No: LKC 21 1680-B1-EK

Reporting Date: 17/03/2023

Acronym	Description
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
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym

Benzene - HS_1D_MS
Ethylbenzene - HS_1D_MS
MTBE - HS_1D_MS
Mineral Oil (C10 - C40) (BS EN 12457-3) - EH_CU_1D_AL
TPH CWG - Aliphatic >C10 - C12 - EH_CU_1D_AL
TPH CWG - Aliphatic >C12 - C16 - EH_CU_1D_AL
TPH CWG - Aliphatic >C16 - C21 - EH_CU_1D_AL
TPH CWG - Aliphatic >C21 - C34 - EH_CU_1D_AL
TPH CWG - Aliphatic >C5 - C6 - HS_1D_MS_AL
TPH CWG - Aliphatic >C6 - C8 - HS_1D_MS_AL
TPH CWG - Aliphatic >C8 - C10 - EH_CU_1D_AL
TPH CWG - Aliphatic C5 - C34 - HS_1D_MS+EH_CU_1D_AL
TPH CWG - Aromatic >C10 - C12 - EH_CU_1D_AR
TPH CWG - Aromatic >C12 - C16 - EH_CU_1D_AR
TPH CWG - Aromatic >C16 - C21 - EH_CU_1D_AR
TPH CWG - Aromatic >C21 - C35 - EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C35 - HS_1D_MS+EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C7 - HS_1D_MS_AR
TPH CWG - Aromatic >C7 - C8 - HS_1D_MS_AR
TPH CWG - Aromatic >C8 - C10 - EH_CU_1D_AR
TPH CWG - Total >C5 - C35 - HS_1D_MS+EH_CU_1D_Total
TPH LQM - Aliphatic >C10 - C12 - EH_CU_1D_AL
TPH LQM - Aliphatic >C12 - C16 - EH_CU_1D_AL
TPH LQM - Aliphatic >C16 - C35 - EH_CU_1D_AL
TPH LQM - Aliphatic >C35 - C44 - EH_CU_1D_AL
TPH LQM - Aliphatic >C5 - C44 - HS_1D_MS+EH_CU_1D_AL
TPH LQM - Aliphatic >C5 - C6 - HS_1D_MS_AL
TPH LQM - Aliphatic >C6 - C8 - HS_1D_MS_AL
TPH LQM - Aliphatic >C8 - C10 - EH_CU_1D_AL
TPH LQM - Aromatic >C10 - C12 - EH_CU_1D_AR
TPH LQM - Aromatic >C12 - C16 - EH_CU_1D_AR
TPH LQM - Aromatic >C21 - C35 - EH_CU_1D_AR
TPH LQM - Aromatic >C35 - C44 - EH_CU_1D_AR
TPH LQM - Aromatic >C5 - C44 - HS_1D_MS+EH_CU_1D_AR
TPH LQM - Aromatic >C5 - C7 - HS_1D_MS_AR
TPH LQM - Aromatic >C7 - C8 - HS_1D_MS_AR
TPH LQM - Aromatic >C8 - C10 - EH_CU_1D_AR
TPH LQM - Total >C5 - C44 - HS_1D_MS+EH_CU_1D_Total
Toluene - HS_1D_MS
Total BTEX (BS EN 12457-3) - HS_1D_MS_Total
m & p-xylene - HS_1D_MS
o-Xylene - HS_1D_MS

Parameter	Matrix Type	Suite Reference	Expanded Uncertainty Measurement	Unit
TOC	Soil	BS EN 12457	10.4	%
Loss on Ignition	Soil	BS EN 12457	16.9	%
BTEX	Soil	BS EN 12457	14.0	%
Sum of PCBs	Soil	BS EN 12457	21.1	%
Mineral Oil	Soil	BS EN 12457	9.0	%
Total PAH	Soil	BS EN 12457	17.9	%
pH	Soil	BS EN 12457	0.282	Units
Acid Neutralisation Capacity	Soil	BS EN 12457	18.0	%
Arsenic	Leachate	BS EN 12457	19.5	%
Barium	Leachate	BS EN 12457	12.2	%
Cadmium	Leachate	BS EN 12457	17.2	%
Chromium	Leachate	BS EN 12457	20.7	%
Copper	Leachate	BS EN 12457	14.1	%
Mercury	Leachate	BS EN 12457	16.7	%
Molybdenum	Leachate	BS EN 12457	13.3	%
Nickel	Leachate	BS EN 12457	14.0	%
Lead	Leachate	BS EN 12457	12.1	%
Antimony	Leachate	BS EN 12457	16.1	%
Selenium	Leachate	BS EN 12457	15.5	%
Zinc	Leachate	BS EN 12457	14.0	%
Chloride	Leachate	BS EN 12457	15.7	%
Fluoride	Leachate	BS EN 12457	19.1	%
Sulphate	Leachate	BS EN 12457	27.6	%
TDS	Leachate	BS EN 12457	10.0	%
Phenol Index	Leachate	BS EN 12457	12.9	%
DOC	Leachate	BS EN 12457	20.4	%
Clay Content	Soil	BS 3882: 2015	15.0	%
Silt Content	Soil	BS 3882: 2015	14.0	%
Sand Content	Soil	BS 3882: 2015	13.0	%
Loss on Ignition	Soil	BS 3882: 2015	16.9	%
pH	Soil	BS 3882: 2015	0.282	Units
Carbonate	Soil	BS 3882: 2015	12.0	%
Total Nitrogen	Soil	BS 3882: 2015	12.0	%
Phosphorus (Extractable)	Soil	BS 3882: 2015	24.0	%
Potassium (Extractable)	Soil	BS 3882: 2015	20.0	%
Magnesium (Extractable)	Soil	BS 3882: 2015	26.0	%
Zinc	Soil	BS 3882: 2015	19.8	%
Copper	Soil	BS 3882: 2015	23.2	%
Nickel	Soil	BS 3882: 2015	32.6	%
Available Sodium	Soil	BS 3882: 2015	23.0	%
Available Calcium	Soil	BS 3882: 2015	23.0	%
Electrical Conductivity	Soil	BS 3882: 2015	10.0	%



Emma Khadun
LK Consult Limited
Unit 29 Eton Business Park
Eton Hill Road
Manchester
M26 2ZS

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 23-03858

Site Reference: Whalley Road, Ramsbottom

Project / Job Ref: LKC 21 1680

Order No: LKC 21 1680-B1-EK

Sample Receipt Date: 08/03/2023

Sample Scheduled Date: 17/03/2023

Report Issue Number: 1

Reporting Date: 28/03/2023

Authorised by:

Ela Mysiara
Quality Manager

Dates of laboratory activities for each tested analyte are available upon request.

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DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate						
DETS Report No: 23-03858	Date Sampled	02/03/23				
LK Consult Limited	Time Sampled	None Supplied				
Site Reference: Whalley Road, Ramsbottom	TP / BH No	WS104				
Project / Job Ref: LKC 21 1680	Additional Refs	None Supplied				
Order No: LKC 21 1680-B1-EK	Depth (m)	2.00 - 3.00				
Reporting Date: 28/03/2023	DETS Sample No	641764				

Determinand	Unit	RL	Accreditation				
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected			
pH	pH Units	N/a	MCERTS	7.7			
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	71			
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.07			
Organic Matter (SOM)	%	< 0.1	MCERTS	3.4			
Arsenic (As)	mg/kg	< 2	MCERTS	42			
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	1.5			
Chromium (Cr)	mg/kg	< 2	MCERTS	56			
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2			
Copper (Cu)	mg/kg	< 4	MCERTS	134			
Lead (Pb)	mg/kg	< 3	MCERTS	549			
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1			
Nickel (Ni)	mg/kg	< 3	MCERTS	36			
Selenium (Se)	mg/kg	< 2	MCERTS	< 2			
Vanadium (V)	mg/kg	< 1	MCERTS	50			
Zinc (Zn)	mg/kg	< 3	MCERTS	276			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
 Subcontracted analysis (S)



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - Speciated PAHs

DETS Report No: 23-03858	Date Sampled	02/03/23				
LK Consult Limited	Time Sampled	None Supplied				
Site Reference: Whalley Road, Ramsbottom	TP / BH No	WS104				
Project / Job Ref: LKC 21 1680	Additional Refs	None Supplied				
Order No: LKC 21 1680-B1-EK	Depth (m)	2.00 - 3.00				
Reporting Date: 28/03/2023	DETS Sample No	641764				

Determinand	Unit	RL	Accreditation				
Naphthalene	mg/kg	< 0.1	MCERTS	0.14			
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1			
Acenaphthene	mg/kg	< 0.1	MCERTS	0.26			
Fluorene	mg/kg	< 0.1	MCERTS	0.13			
Phenanthrene	mg/kg	< 0.1	MCERTS	1.79			
Anthracene	mg/kg	< 0.1	MCERTS	0.36			
Fluoranthene	mg/kg	< 0.1	MCERTS	2.98			
Pyrene	mg/kg	< 0.1	MCERTS	2.78			
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	1.08			
Chrysene	mg/kg	< 0.1	MCERTS	1.08			
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	1.17			
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.32			
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	1.06			
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.53			
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1			
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.44			
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	14.1			



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - Sample Descriptions

DETS Report No: 23-03858	
LK Consult Limited	
Site Reference: Whalley Road, Ramsbottom	
Project / Job Ref: LKC 21 1680	
Order No: LKC 21 1680-B1-EK	
Reporting Date: 28/03/2023	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
\$ 641764	WS104	None Supplied	2.00 - 3.00	22.4	Black sandy clay with stones

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ¹/s

Unsuitable Sample ^u/s

\$ samples exceeded recommended holding times



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 23-03858

LK Consult Limited

Site Reference: Whalley Road, Ramsbottom

Project / Job Ref: LKC 21 1680

Order No: LKC 21 1680-B1-EK

Reporting Date: 28/03/2023

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphénylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (all: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (all: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



List of HWOL Acronyms and Operators	
DETS Report No: 23-03858	
LK Consult Limited	
Site Reference: Whalley Road, Ramsbottom	
Project / Job Ref: LKC 21 1680	
Order No: LKC 21 1680-B1-EK	
Reporting Date: 28/03/2023	

Acronym	Description
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
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
—	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym

Appendix E

Certificates of Analysis - Geotechnical

TEST REPORT

Client LK Consult Ltd

Address Unit 29 Eton Business Park
Eton Hill Road
Radcliffe
Greater Manchester
M26 2ZS

Contract LKC 21 1680 -
Whalley Road, Ramsbottom

Job Number MRN 4606/23
Date of Issue 21 March 2023
Page 1 of 4

Approved Signatories

S J Hutchings, O P Davies

Notes

- 1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.
- 2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.
- 3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.
- 4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.
- 5 The results included within the report are representative of the samples submitted for analysis.
- 6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.



Andrew House, Hadfield Street, Dukinfield, Cheshire SK16 4QX Tel: 0161 475 0870
Email: enquiries@murrayrix.com Website: www.murrayrix.com

Also at: London: 020 8523 1999

Murray Rix is the trading name of Murray Rix (Northern) Limited. Registered in England 2878361

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870



TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014

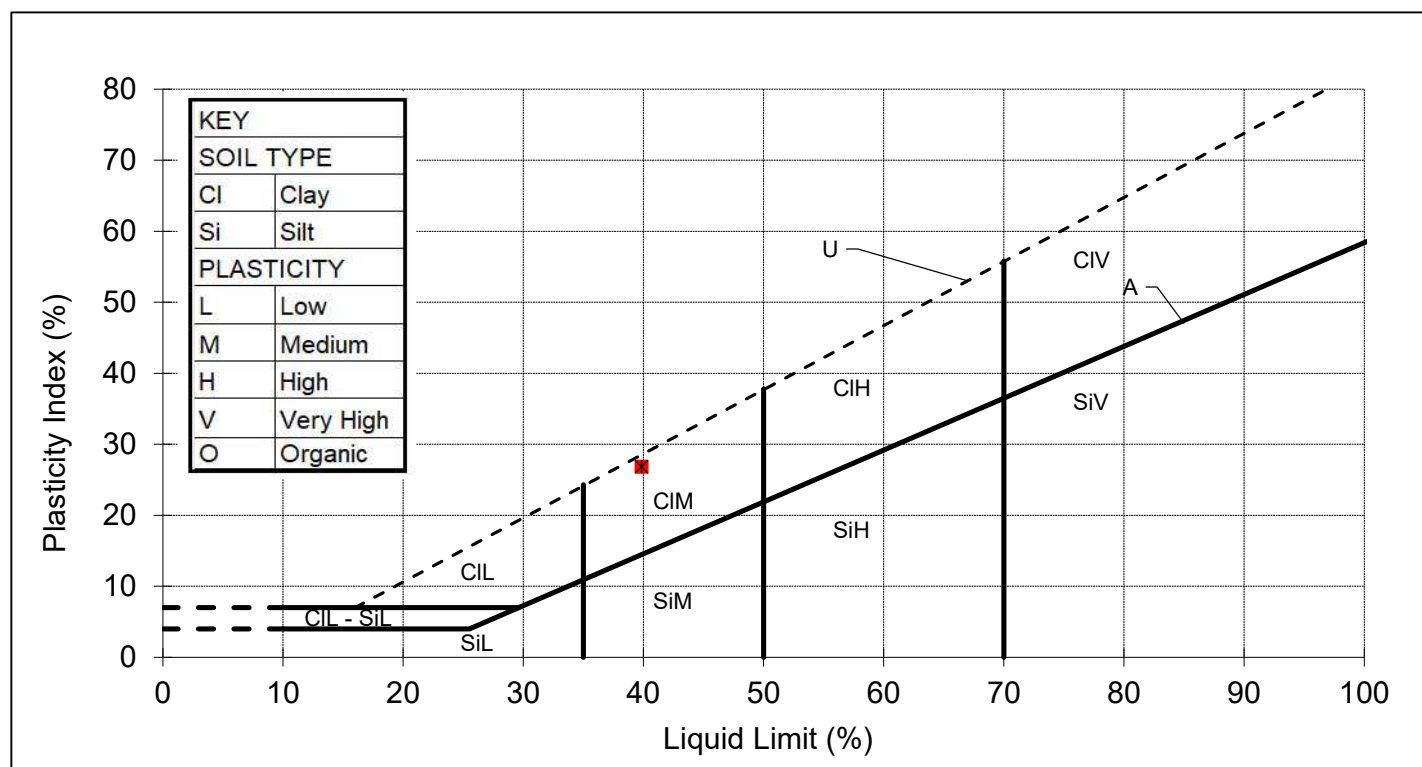
CLIENT	LK Consult Ltd
SITE	LKC 21 1680 - Whalley Road, Ramsbottom
JOB NUMBER	MRN 4606/23

SAMPLE LABEL	WS101/1.3-1.5m	DATE SAMPLED	02-Mar-23
SAMPLE No.	122357	DATE RECEIVED	09-Mar-23
DATE TESTED	13-Mar-23	SAMPLED BY	Client

MATERIAL	Stiff brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Moisture Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	18.0	38.2	1.039	
Determination 2 (avg)	18.0	38.5		

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
15.0	40	13	27	85



REMARKS

SIGNED

NAME

O.P. Davies BA (Hons)
(Laboratory Manager)

DATE

21-Mar-23

TEST CERTIFICATE
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

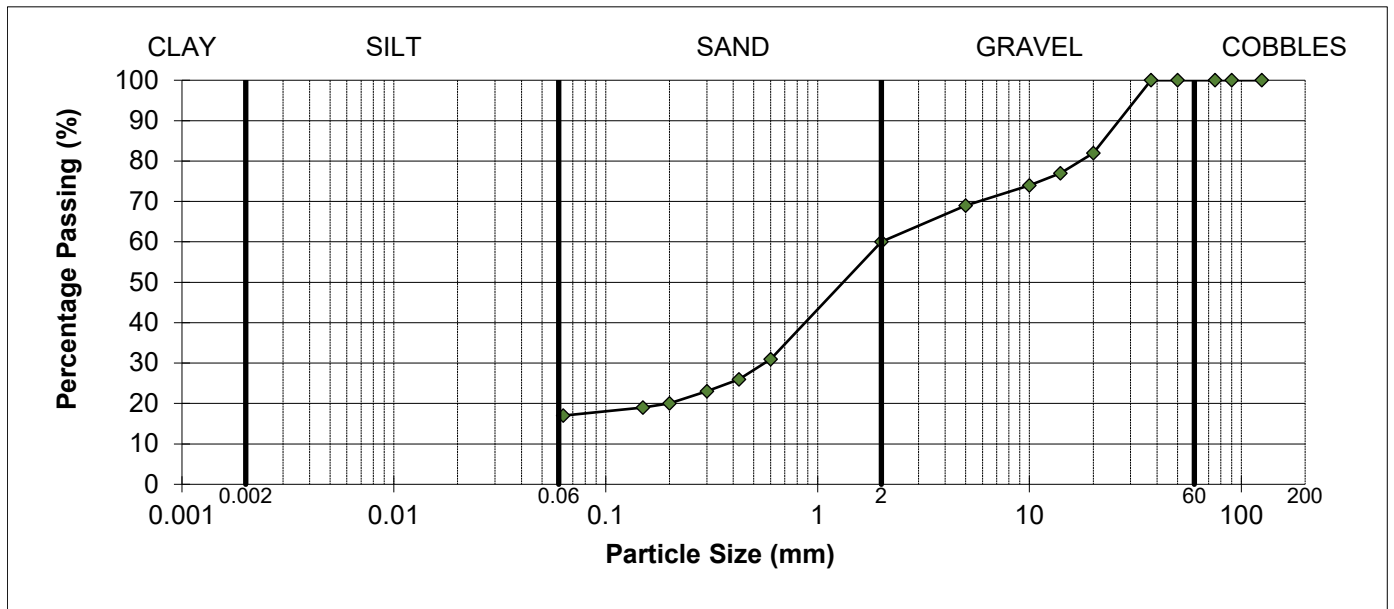
Determination of Water Content in accordance with BS EN ISO 17892-1:2014 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 21 1680 - Whalley Road, Ramsbottom
JOB NUMBER	MRN 4606/23

SAMPLE LABEL	WS101/2.5-3m	DATE SAMPLED	02-Mar-23
LAB SAMPLE No	122358	DATE RECEIVED	09-Mar-23
DATE TESTED	13-Mar-23	SAMPLED BY	Client

MATERIAL	Yellow brown silty SAND & GRAVEL
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	69	
90	100		2	60	
75	100		0.6	31	
50	100		0.425	26	
37.5	100		0.3	23	
20	82		0.2	20	
14	77		0.15	19	
10	74		0.063	17	



REMARKS

As received water content = 15.4%

SIGNED



NAME

O.P. Davies BA (Hons)
(Laboratory Manager)

DATE

21-Mar-23

TEST CERTIFICATE
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

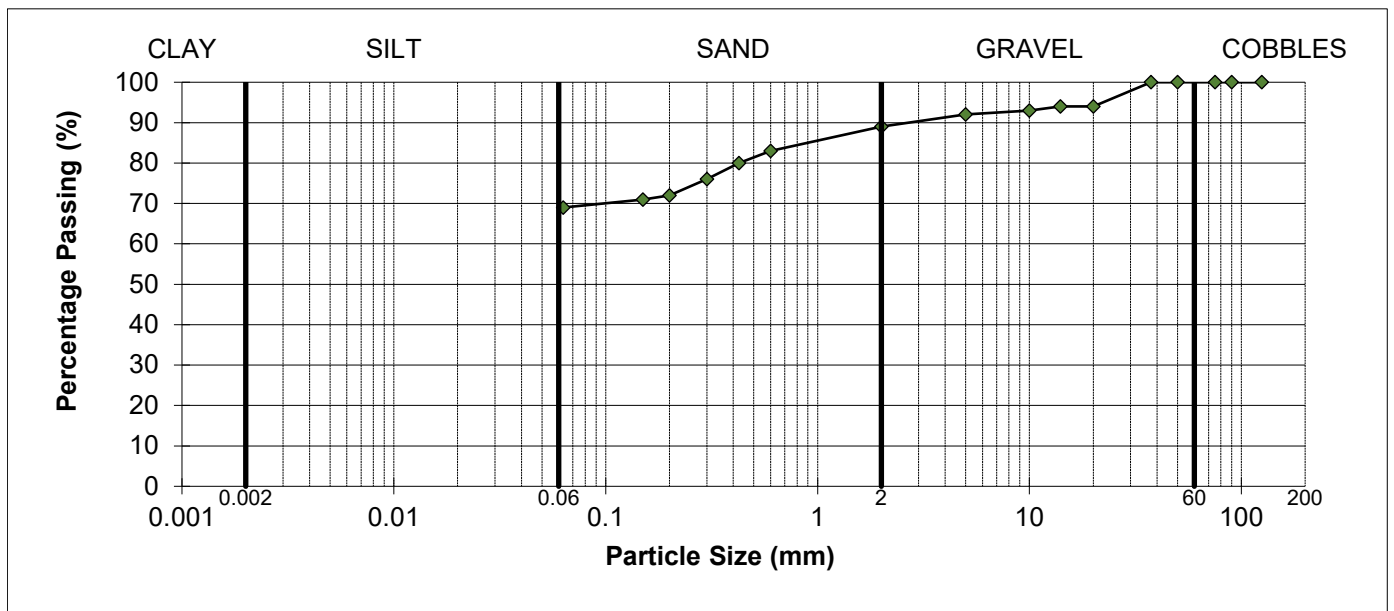
Determination of Water Content in accordance with BS EN ISO 17892-1:2014 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 21 1680 - Whalley Road, Ramsbottom
JOB NUMBER	MRN 4606/23

SAMPLE LABEL	WS102/1.2-1.5m	DATE SAMPLED	02-Mar-23
LAB SAMPLE No	122359	DATE RECEIVED	09-Mar-23
DATE TESTED	13-Mar-23	SAMPLED BY	Client

MATERIAL	Stiff brown silty slightly sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	92	
90	100		2	89	
75	100		0.6	83	
50	100		0.425	80	
37.5	100		0.3	76	
20	94		0.2	72	
14	94		0.15	71	
10	93		0.063	69	



REMARKS

As received water content = 17.9%

SIGNED



NAME

O.P. Davies BA (Hons)
(Laboratory Manager)

DATE

21-Mar-23

Appendix F

Certificates of Analysis – Water



Emma Khadun
LK Consult Limited
Unit 29 Eton Business Park
Eton Hill Road
Manchester
M26 2ZS

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 23-04768

Site Reference: Whalley Road, Ramsbottom

Project / Job Ref: LKC 21 1680

Order No: LKC 21 1680- B1-EK

Sample Receipt Date: 06/04/2023

Sample Scheduled Date: 06/04/2023

Report Issue Number: 1

Reporting Date: 13/04/2023

Authorised by:

Kevin Old
Operations Director

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. 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 except in full, without the prior written approval of the laboratory.



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Unit 1, Rose Lane Industrial Estate
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Maidstone
Kent ME17 2JN
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Water Analysis Certificate						
DETS Report No: 23-04768	Date Sampled	05/04/23	05/04/23	05/04/23		
LK Consult Limited	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Whalley Road, Ramsbottom	TP / BH No	WS101	WS104	WS105		
Project / Job Ref: LKC 21 1680	Additional Refs	GW	GW	GW		
Order No: LKC 21 1680- B1-EK	Depth (m)	None Supplied	None Supplied	None Supplied		
Reporting Date: 13/04/2023	DETS Sample No	645766	645767	645768		

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	ISO17025	6.3	6.8	6.8		
Total Cyanide	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Free Cyanide	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Sulphate as SO ₄	mg/l	< 1	ISO17025	87	11	11		
Dissolved Organic Carbon (DOC)	mg/l	< 0.1	ISO17025	27.8	31.6	4.5		
Hardness - Total	mgCaCO ₃ /l	< 1	NONE	177	259	259		
Arsenic (dissolved)	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Boron (dissolved)	ug/l	< 5	ISO17025	58	52	52		
Cadmium (dissolved)	ug/l	< 0.4	ISO17025	< 0.4	< 0.4	< 0.4		
Chromium (dissolved)	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Chromium (hexavalent)	ug/l	< 20	NONE	< 20	< 20	< 20		
Copper (dissolved)	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Lead (dissolved)	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Mercury (dissolved)	ug/l	< 0.05	ISO17025	< 0.05	< 0.05	< 0.05		
Nickel (dissolved)	ug/l	< 5	ISO17025	5	6	6		
Selenium (dissolved)	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Vanadium (dissolved)	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Zinc (dissolved)	ug/l	< 2	ISO17025	10	151	150		
Calcium (dissolved)	mg/l	< 0.2	ISO17025	60.2	94.1	94.3		
Total Phenols (monohydric)	ug/l	< 10	ISO17025	< 10	< 10	< 10		

Subcontracted analysis ⁽⁵⁾
Insufficient sample ^{1/5}
Unsuitable Sample ^{1/5}



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Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Water Analysis Certificate - Speciated PAH						
DETS Report No: 23-04768	Date Sampled	05/04/23	05/04/23	05/04/23		
LK Consult Limited	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Whalley Road, Ramsbottom	TP / BH No	WS101	WS104	WS105		
Project / Job Ref: LKC 21 1680	Additional Refs	GW	GW	GW		
Order No: LKC 21 1680- B1-EK	Depth (m)	None Supplied	None Supplied	None Supplied		
Reporting Date: 13/04/2023	DETS Sample No	645766	645767	645768		

Determinand	Unit	RL	Accreditation				
Naphthalene	ug/l	< 0.01	NONE	< 0.01	0.15	2.05	
Acenaphthylene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	
Acenaphthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	2.12	
Fluorene	ug/l	< 0.01	NONE	< 0.01	< 0.01	0.62	
Phenanthrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	0.82	
Anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	0.15	
Fluoranthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	0.21	
Pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	0.16	
Benzo(a)anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	
Chrysene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	
Benzo(b)fluoranthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	
Benzo(k)fluoranthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	
Benzo(a)pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	
Indeno(1,2,3-cd)pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	
Dibenz(a,h)anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01	
Benzo(ghi)perylene	ug/l	0.008	NONE	< 0.008	< 0.008	< 0.008	
Total EPA-16 PAHs	ug/l	< 0.16	NONE	< 0.16	< 0.16	6.13	



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Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Water Analysis Certificate - TPH LQM Banded						
DETS Report No: 23-04768	Date Sampled	05/04/23	05/04/23	05/04/23		
LK Consult Limited	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Whalley Road, Ramsbottom	TP / BH No	WS101	WS104	WS105		
Project / Job Ref: LKC 21 1680	Additional Refs	GW	GW	GW		
Order No: LKC 21 1680- B1-EK	Depth (m)	None Supplied	None Supplied	None Supplied		
Reporting Date: 13/04/2023	DETS Sample No	645766	645767	645768		

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6 : HS 1D MS AL	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C6 - C8 : HS 1D MS AL	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C8 - C10 : EH CU 1D AL	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C10 - C12 : EH CU 1D AL	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C12 - C16 : EH CU 1D AL	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C16 - C35 : EH CU 1D AL	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic >C35 - C44 : EH CU 1D AL	ug/l	< 10	NONE	< 10	< 10	< 10		
Aliphatic (C5 - C44) : HS_1D_MS+EH_CU_1D_AL	ug/l	< 70	NONE	< 70	< 70	< 70		
Aromatic >C5 - C7 : HS 1D MS AR	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C7 - C8 : HS 1D MS AR	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C8 - C10 : EH CU 1D AR	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C10 - C12 : EH CU 1D AR	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C12 - C16 : EH CU 1D AR	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C16 - C21 : EH CU 1D AR	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C21 - C35 : EH CU 1D AR	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic >C35 - C44 : EH CU 1D AR	ug/l	< 10	NONE	< 10	< 10	< 10		
Aromatic (>C5 - C44) : HS_1D_MS+EH_CU_1D_AR	ug/l	< 70	NONE	< 70	< 70	< 70		
Total >C5 - C44 : HS_1D_MS+EH_CU_1D_Tot al	ug/l	< 140	NONE	< 140	< 140	< 140		



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Water Analysis Certificate - BTEX / MTBE						
DETS Report No: 23-04768	Date Sampled	05/04/23	05/04/23	05/04/23		
LK Consult Limited	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Whalley Road, Ramsbottom	TP / BH No	WS101	WS104	WS105		
Project / Job Ref: LKC 21 1680	Additional Refs	GW	GW	GW		
Order No: LKC 21 1680- B1-EK	Depth (m)	None Supplied	None Supplied	None Supplied		
Reporting Date: 13/04/2023	DETS Sample No	645766	645767	645768		

Determinand	Unit	RL	Accreditation					
Benzene : HS_1D_MS	ug/l	< 1	ISO17025	< 1	< 1	< 1		
Toluene : HS_1D_MS	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Ethylbenzene : HS_1D_MS	ug/l	< 5	ISO17025	< 5	< 5	< 5		
p & m-xylene : HS_1D_MS	ug/l	< 10	ISO17025	< 10	< 10	< 10		
o-xylene : HS_1D_MS	ug/l	< 5	ISO17025	< 5	< 5	< 5		
MTBE : HS_1D_MS	ug/l	< 10	ISO17025	< 10	< 10	< 10		



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Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Water Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 23-04768

LK Consult Limited

Site Reference: Whalley Road, Ramsbottom

Project / Job Ref: LKC 21 1680

Order No: LKC 21 1680- B1-EK

Reporting Date: 13/04/2023

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	F	Ammoniacal Nitrogen	Determination of ammoniacal nitrogen by discrete analyser.	E126
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR dete	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GI-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



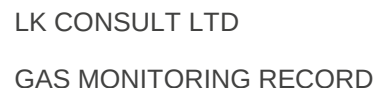
List of HWOL Acronyms and Operators

Acronym	Description
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
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym
Benzene - HS_1D_MS
Ethylbenzene - HS_1D_MS
MTBE - HS_1D_MS
TPH LQM - Aliphatic >C10 - C12 - EH_CU_1D_AL
TPH LQM - Aliphatic >C12 - C16 - EH_CU_1D_AL
TPH LQM - Aliphatic >C16 - C35 - EH_CU_1D_AL
TPH LQM - Aliphatic >C35 - C44 - EH_CU_1D_AL
TPH LQM - Aliphatic >C5 - C44 - HS_1D_MS+EH_CU_1D_AL
TPH LQM - Aliphatic >C5 - C6 - HS_1D_MS_AL
TPH LQM - Aliphatic >C6 - C8 - HS_1D_MS_AL
TPH LQM - Aliphatic >C8 - C10 - EH_CU_1D_AL
TPH LQM - Aromatic >C10 - C12 - EH_CU_1D_AR
TPH LQM - Aromatic >C12 - C16 - EH_CU_1D_AR
TPH LQM - Aromatic >C16 - C21 - EH_CU_1D_AR
TPH LQM - Aromatic >C21 - C35 - EH_CU_1D_AR
TPH LQM - Aromatic >C35 - C44 - EH_CU_1D_AR
TPH LQM - Aromatic >C5 - C44 - HS_1D_MS+EH_CU_1D_AR
TPH LQM - Aromatic >C5 - C7 - HS_1D_MS_AR
TPH LQM - Aromatic >C7 - C8 - HS_1D_MS_AR
TPH LQM - Aromatic >C8 - C10 - EH_CU_1D_AR
TPH LQM - Total >C5 - C44 - HS_1D_MS+EH_CU_1D_Total
Toluene - HS_1D_MS
m & p-xylene - HS_1D_MS
o-Xylene - HS_1D_MS

Appendix G

Gas Monitoring Results



Equipment ¹		
Instrument	Serial Number	Comments
Gas Analyser GA5000	G502417	Serviced, calibrated, gas checked.
HydroTechnik	HT-01	Operating normally.
Pho-Check Tiger	T-106802	Serviced, calibrated.

[illegible]

ABBREVIATIONS	
ND	Not detected
NR	Not recorded
UR	Unable to record
OS	Off recordable scale
N/A	Not applicable
ppm	Parts per million
mb	Millibars
l/hr	Litres per hour
mbgl	Metres below ground level
LEL	Lower explosive limit in air

NOTES	
All monitoring is carried out in line with LK Consult Ltd procedures, with reference to CIRIA C665.	
¹ Equipment is serviced and checked as recommended by the manufacturer. Refer to calibration records and service certificates.	
² CH4 is explosive between the range of 5-15%v/v. 100% lower explosive limit is equal to 5%v/v CH4.	
³ Flow readings are based on a 1 minute average value where flow is detected (equipment range of +/- 12 ltr/hr).	

Site	Whalley Road, Ramsbottom
Job Number	LKC 21 1680
Date	22/03/2023
Engineer	CK
Visit	2 of 6

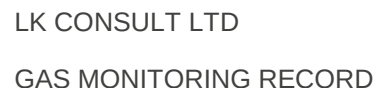
Equipment ¹		
Instrument	Serial Number	Comments
Gas Analyser GA5000	G507783	Serviced, calibrated, gas checked.
HydroTechnik	HT-03	Operating normally.
-	-	Serviced, calibrated.

Atmospheric / Ground Conditions	
Atmospheric pressure trend onsite	Rising
Atmospheric pressure (prev 24hrs)	Falling
Weather Conditions	Sunny, moderate breeze, mild
Ground Conditions	Wet

[illegible]

ABBREVIATIONS	
ND	Not detected
NR	Not recorded
UR	Unable to record
OS	Off recordable scale
N/A	Not applicable
ppm	Parts per million
mb	Millibars
l/hr	Litres per hour
mbgl	Metres below ground level
LEL	Lower explosive limit in air

NOTES	
All monitoring is carried out in line with LK Consult Ltd procedures, with reference to CIRIA C665.	
¹ Equipment is serviced and checked as recommended by the manufacturer. Refer to calibration records and service certificates.	
² CH4 is explosive between the range of 5-15%v/v. 100% lower explosive limit is equal to 5%v/v CH4.	
³ Flow readings are based on a 1 minute average value where flow is detected (equipment range of +/- 12 ltr/hr).	

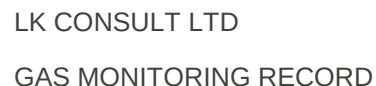


Equipment ¹		
Instrument	Serial Number	Comments
Gas Analyser GA5000	G507783	Serviced, calibrated, gas checked.
HydroTechnik	HT-01	Operating normally.
-	-	-

[illegible]

ABBREVIATIONS	
ND	Not detected
NR	Not recorded
UR	Unable to record
OS	Off recordable scale
N/A	Not applicable
ppm	Parts per million
mb	Millibars
l/hr	Litres per hour
mbgl	Metres below ground level
LEL	Lower explosive limit in air

NOTES	
All monitoring is carried out in line with LK Consult Ltd procedures, with reference to CIRIA C665.	
¹ Equipment is serviced and checked as recommended by the manufacturer. Refer to calibration records and service certificates.	
² CH4 is explosive between the range of 5-15%v/v. 100% lower explosive limit is equal to 5%v/v CH4.	
³ Flow readings are based on a 1 minute average value where flow is detected (equipment range of +/- 12 ltr/hr).	



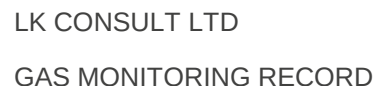
Equipment ¹		
Instrument	Serial Number	Comments
Gas Analyser GA5000	G502417	Serviced, calibrated, gas checked.
potech Oil-in-Water Interface Me	81454-14	Operating normally.
Pho-Check Tiger	T-106802	Serviced, calibrated.

Atmospheric / Ground Conditions	
Atmospheric pressure trend onsite	Steady
Atmospheric pressure (prev 24hrs)	Steady
Weather Conditions	Clear, slight breeze, mild
Ground Conditions	Drv

[illegible]

ABBREVIATIONS	
ND	Not detected
NR	Not recorded
UR	Unable to record
OS	Off recordable scale
N/A	Not applicable
ppm	Parts per million
mb	Millibars
l/hr	Litres per hour
mbgl	Metres below ground level
LEL	Lower explosive limit in air

NOTES	
All monitoring is carried out in line with LK Consult Ltd procedures, with reference to CIRIA C665.	
¹ Equipment is serviced and checked as recommended by the manufacturer. Refer to calibration records and service certificates.	
² CH4 is explosive between the range of 5-15%v/v. 100% lower explosive limit is equal to 5%v/v CH4.	
³ Flow readings are based on a 1 minute average value where flow is detected (equipment range of +/- 12 ltr/hr).	



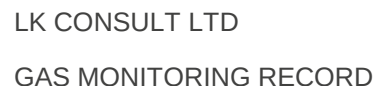
Equipment ¹		
Instrument	Serial Number	Comments
Gas Analyser GA5000	G502417	Serviced, calibrated, gas checked.
potech Oil-in-Water Interface Me	81454-14	Operating normally.
Mini Rae Lite	PGM7300	Serviced, calibrated.

Atmospheric / Ground Conditions	
Atmospheric pressure trend onsite	Steady
Atmospheric pressure (prev 24hrs)	Steady
Weather Conditions	Sunny, Steady, Warm
Ground Conditions	Dry

[illegible]

ABBREVIATIONS	
ND	Not detected
NR	Not recorded
UR	Unable to record
OS	Off recordable scale
N/A	Not applicable
ppm	Parts per million
mb	Millibars
l/hr	Litres per hour
mbgl	Metres below ground level
LEL	Lower explosive limit in air

NOTES
All monitoring is carried out in line with LK Consult Ltd procedures, with reference to CIRIA C665.
¹ Equipment is serviced and checked as recommended by the manufacturer. Refer to calibration records and service certificates.
² CH4 is explosive between the range of 5-15%v/v. 100% lower explosive limit is equal to 5%v/v CH4.
³ Flow readings are based on a 1 minute average value where flow is detected (equipment range of +/- 12 ltr/hr).



Equipment ¹		
Instrument	Serial Number	Comments
Gas Analyser GA5000	G502417	Serviced, calibrated, gas checked.
HydroTechnik	HT-01	Operating normally.
Pho-Check Tiger	T-106802	Serviced, calibrated.

[illegible]

ABBREVIATIONS	
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ppm	Parts per million
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LEL	Lower explosive limit in air

NOTES
All monitoring is carried out in line with LK Consult Ltd procedures, with reference to CIRIA C665.
¹ Equipment is serviced and checked as recommended by the manufacturer. Refer to calibration records and service certificates.
² CH4 is explosive between the range of 5-15%v/v. 100% lower explosive limit is equal to 5%v/v CH4.
³ Flow readings are based on a 1 minute average value where flow is detected (equipment range of +/- 12 ltr/hr).

Appendix H

Generic Assessment Criteria Values

CATEGORY 4 SCREENING LEVELS

Substance	Residential (with home- grown produce)	Residential (without home- grown produce)	Allotments	Commercial	Public Open Space 1	Public Open Space 2
Arsenic	37 mg/kg	40 mg/kg	49 mg/kg	640 mg/kg	79 mg/kg	170 mg/kg
Benzene	0.87 mg/kg	3.3 mg/kg	0.18 mg/kg	98 mg/kg	140 mg/kg	230 mg/kg
Benzo(a)pyrene	5.0 mg/kg	5.3 mg/kg	5.7 mg/kg	77 mg/kg	10 mg/kg	21 mg/kg
Cadmium	22 mg/kg	150 mg/kg	3.9 mg/kg	410 mg/kg	220 mg/kg	880 mg/kg
Chromium VI	21 mg/kg	21 mg/kg	170 mg/kg	49 mg/kg	21 mg/kg	250 mg/kg
Lead	200 mg/kg	310 mg/kg	80 mg/kg	2300 mg/kg	630 mg/kg	1300 mg/kg

Tetrachlorethene (PCE) – 1% SOM	0.31 mg/kg	0.32 mg/kg	2.0 mg/kg	24 mg/kg	3,200 mg/kg	1,400 mg/kg
Tetrachlorethene (PCE) – 2.5% SOM	0.70 mg/kg	0.71 mg/kg	4.8 mg/kg	55 mg/kg	3,300 mg/kg	1,900 mg/kg
Tetrachlorethene (PCE) – 6% SOM	1.6 mg/kg	1.6 mg/kg	11 mg/kg	130 mg/kg	3,400 mg/kg	2,500 mg/kg
Trichlorethene (TCE) – 1% SOM	0.0093 mg/kg	0.0097 mg/kg	0.032 mg/kg	0.73 mg/kg	76 mg/kg	41 mg/kg
Trichlorethene (TCE) – 2.5% SOM	0.020 mg/kg	0.020 mg/kg	0.072 mg/kg	1.5 mg/kg	78 mg/kg	54 mg/kg
Trichlorethene (TCE) – 6% SOM	0.043 mg/kg	0.045 mg/kg	0.16 mg/kg	3.4 mg/kg	79 mg/kg	69 mg/kg
Vinyl Chloride (VC) – 1%SOM	0.0064 mg/kg	0.015 mg/kg	0.0017 mg/kg	1.1 mg/kg	7.8 mg/kg	18 mg/kg
Vinyl Chloride (VC) – 2.5%SOM	0.010 mg/kg	0.019 mg/kg	0.0031 mg/kg	1.4 mg/kg	7.8 mg/kg	19 mg/kg
Vinyl Chloride (VC) – 6%SOM	0.017 mg/kg	0.029 mg/kg	0.0058 mg/kg	2.2 mg/kg	7.8 mg/kg	19 mg/kg

Summary Table for the Generic Assessment Criteria for Human Health Risk Assessment Land Quality Management (LQM) S4ULs.

All GAC are based on sandy
loam soils with a pH 7.

All GAC are based on sandy loam soils with a pH 7.			LQM Generic Assessment Criteria (mg/kg) Dry weight soil					
Contaminant		SOM	Res +	Res -	Allot.	Comm.	POS _{resi}	POS _{park}
Metals	Inorganic Arsenic	6%	37	40	43	640	79	170
	Beryllium	6%	1.7	1.7	35	12	2.2	63
	Boron	6%	290	11,000	45	240,000	21,000	46,000
	Cadmium	6%	11	85	1.9	190	120	532
	Chromium (III)	6%	910	910	18,000	8,600	1,500	33,000
	Chromium (VI)	6%	6.0	6.0	1.8	33	7.7	220
	Copper	6%	2,400	7,100	520	68,000	12,000	44,000
	Elemental Mercury	6%	1.2	1.2	21	58 (25.8) ^{vap}	16	30 (25.8) ^{vap}
	Inorganic Mercury	6%	40	56	19	1,100	120	240
	Methylmercury	6%	11	15	6.0	320	40	68
	Nickel (update 2015)	6%	126	181	53	983	231	804
	Selenium	6%	250	430	88	12,000	1,100	1,800
	Vanadium	6%	410	1,200	91	9,000	2,000	5,000
Zinc	6%	3,700	40,000	620	730,000	81,000	170,000	
BTEX Compounds	Benzene	1%	0.087	0.38	0.017	27	72	90
		2.5%	0.17	0.70	0.034	47	72	100
		6%	0.37	1.4	0.075	90	73	110
	Toluene	1%	130	880 (869) ^{vap}	22	56,000 (869) ^{vap}	56,000	87,000 (869) ^{vap}
		2.5%	290	1,900	51	110,000 (1,920) ^{vap}	56,000	95,000 (1,920) ^{vap}
		6%	660	3,900	120	180,000 (4,360) ^{vap}	56,000	100,000 (4,360) ^{vap}
	Ethylbenzene	1%	47	83	16	5,700 (518) ^{vap}	24,000	17,000 (518) ^{vap}
		2.5%	110	190	39	13,000 (1,220) ^{vap}	24,000	22,000 (1,220) ^{vap}
		6%	260	440	91	27,000 (2,840) ^{vap}	25,000	27,000 (2,840) ^{vap}
	o-xylene	1%	60	88	28	6,600 (478) ^{sol}	41,000	17,000 (478) ^{sol}
		2.5%	140	210	67	15,000 (1,120) ^{sol}	42,000	24,000 (1,120) ^{sol}
		6%	330	480	160	33,000 (2,620) ^{sol}	43,000	33,000 (2,620) ^{sol}
	m-xylene	1%	59	82	31	6,200 (625) ^{vap}	41,000	17,000 (625) ^{vap}
		2.5%	140	190	74	14,000 (1,470) ^{vap}	42,000	24,000 (1,470) ^{vap}
		6%	320	450	170	31,000 (3,460) ^{vap}	43,000	32,000 (3,460) ^{vap}
	p-xylene	1%	56	79	29	5,900 (576) ^{sol}	41,000	17,000 (576) ^{sol}
		2.5%	130	180	69	14,000 (1,350) ^{sol}	42,000	23,000 (1,350) ^{sol}
		6%	310	430	160	30,000 (3,170) ^{sol}	43,000	31,000 (3,170) ^{sol}

NOTES

^{sol} / ^{vap} = solubility / vapour limit (potentially use if free product identified, although highly conservative).

f = oral, dermal and inhalation exposures compared to oral HCV.

All GAC are based on sandy loam soils with a pH 7.

All GAC are based on sandy loam soils with a pH 7.			LQM Generic Assessment Criteria (mg/kg) Dry weight soil					
Contaminant		SOM	Res +	Res -	Allot.	Comm.	POS _{resi}	POS _{park}
Polycyclic Aromatic Hydrocarbons (PAHs)	Acenaphthene	1%	210	3,000 (57.1) ^{sol}	34	84,000 (57.0) ^{sol}	15,000	29,000
		2.5%	510	4,700 (141) ^{sol}	85	97,000 (141) ^{sol}	15,000	30,000
		6%	1,100	6,000 (336) ^{sol}	200	100,000	15,000	30,000
	Acenaphthylene	1%	170	2,900 (86.1) ^{sol}	28	83,000 (86.1) ^{sol}	15,000	29,000
		2.5%	420	4,600 (212) ^{sol}	69	97,000 (212) ^{sol}	15,000	30,000
		6%	920	6,000 (506) ^{sol}	160	100,000	15,000	30,000
	Anthracene	1%	2,400	31,000 (1.17) ^{vap}	380	520,000	74,000	150,000
		2.5%	5,400	35,000	950	540,000	74,000	150,000
		6%	11,000	37,000	2,200	540,000	74,000	150,000
	Benz(a)anthracene	1%	7.2	11	2.9	170	29	49
		2.5%	11	14	6.5	170	29	56
		6%	13	15	13	180	29	62
	Benzo(a)pyrene (only)	1%	2.2	3.2	0.97	35	5.7	11
		2.5%	2.7	3.2	2.0	35	5.7	12
		6%	3.0	3.2	3.5	36	5.7	13
	Benzo(b)fluoranthene	1%	2.6	3.9	0.99	44	7.1	13
		2.5%	3.3	4.0	2.1	44	7.2	15
		6%	3.7	4.0	3.9	45	7.2	16
	Benzo(ghi)perylene	1%	320	360	290	3,900	640	1,400
		2.5%	340	360	470	4,000	640	1,500
		6%	350	360	640	4,000	640	1,600
	Benzo(k)fluoranthene	1%	77	110	37	1,200	190	370
		2.5%	93	110	75	1,200	190	410
		6%	100	110	130	1,200	190	440
	Chrysene	1%	15	30	4.1	350	57	93
		2.5%	22	31	9.4	350	57	110
		6%	27	32	19	350	57	120
	Dibenzo(ah)anthracene	1%	0.24	0.31	0.14	3.5	0.57	1.1
		2.5%	0.28	0.32	0.27	3.6	0.58	1.3
		6%	0.3	0.32	0.43	3.6	0.58	1.4
	Fluoranthene	1%	280	1,500	52	23,000	3,100	6,300
		2.5%	560	1,600	130	23,000	3,100	6,300
		6%	890	1,600	290	23,000	3,100	6,400
	Fluorene	1%	170	2,800 (36.0) ^{sol}	27	63,000 (30.9) ^{sol}	9,900	20,000
		2.5%	400	3,800 (76.5) ^{sol}	67	68,000	9,900	20,000
		6%	860	4,500 (183) ^{sol}	160	71,000	9,900	20,000
	Indeno(123-cd)pyrene	1%	27	45	9.5	500	82	150
		2.5%	36	46	21	510	82	170
		6%	41	46	39	510	82	180
	Naphthalene	1%	2.3 ^f	2.3 ^f	4.1 ^f	190 ^f (76.4) ^{sol}	4,900 ^f	1,200 ^f (76.4) ^{sol}
		2.5%	5.6 ^f	5.6 ^f	10 ^f	460 ^f (183) ^{sol}	4,900 ^f	1,900 ^f (183) ^{sol}
		6%	13 ^f	13 ^f	24 ^f	1,100 ^f (432) ^{sol}	4,900 ^f	3,000
	Phenanthrene	1%	95	1,300 (36.0) ^{sol}	15	22,000	3,100	6,200
		2.5%	220	1,500	38	22,000	3,100	6,200
		6%	440	1,500	90	22,000	3,100	6,300
	Pyrene	1%	620	3,700	110	54,000	7,400	15,000
		2.5%	1,200	3,800	270	54,000	7,400	15,000
		6%	2,000	3,800	620	54,000	7,400	15,000
Coal Tar (B(a)P as surrogate marker)	1%	0.79	1.2	0.32	15	2.2	4.4	
	2.5%	0.98	1.2	0.67	15	2.2	4.7	
	6%	1.1	1.2	1.2	15	2.2	4.8	

NOTES

^{sol} / ^{vap} = solubility / vapour limit (potentially use if free product identified, although highly conservative).

^f = naphthalene is based on comparison of inhalation exposure with TDI_{inhal} for localised effect.

All GAC are based on sandy loam soils with a pH 7.

LQM Generic Assessment Criteria (mg/kg) Dry weight soil

Contaminant	SOM	Res +	Res -	Allot.	Comm.	POS _{resi}	POS _{park}
Aliphatic							
EC 5-6	1%	42	42	730	3,200 (304) ^{sol}	570,000(304) ^{sol}	95,000 (304) ^{sol}
EC>6-8	1%	100	100	2,300	7,800 (144) ^{sol}	600,000	150,000 (144) ^{sol}
EC>8-10	1%	27	27	320	2,000 (78) ^{sol}	13,000	14,000 (78) ^{vap}
EC>10-12	1%	130 (48) ^{vap}	130 (48) ^{vap}	2,200	9,700 (48) ^{sol}	13,000	21,000 (48) ^{vap}
EC>12-16	1%	1,100 (24) ^{sol}	1,100 (24) ^{sol}	11,000	59,000 (24) ^{sol}	13,000	25,000 (24) ^{sol}
EC>16-35	1%	65,000 (8.48) ^{f, sol}	65,000 (8.48) ^{f, sol}	260,000 ^f	160,000 ^f	250,000 ^f	450,000 ^f
EC>35-44	1%	65,000 (8.48) ^{f, sol}	65,000 (8.48) ^{f, sol}	260,000 ^f	160,000 ^f	250,000 ^f	450,000 ^f
Aliphatic							
EC 5-6	2.5%	78	78	1,700	5,900 (558) ^{sol}	590,000	130,000 (558) ^{sol}
EC>6-8	2.5%	230	230	5,600	17,000 (322) ^{sol}	610,000	220,000 (322) ^{sol}
EC>8-10	2.5%	65	65	770	4,800 (190) ^{vap}	13,000	18,000 (190) ^{vap}
EC>10-12	2.5%	330 (118) ^{vap}	330 (118) ^{vap}	4,400	23,000 (118) ^{vap}	13,000	23,000 (118) ^{vap}
EC>12-16	2.5%	2,400 (59) ^{sol}	2,400 (59) ^{sol}	13,000	82,000 (59) ^{sol}	13,000	25,000 (59) ^{sol}
EC>16-35	2.5%	92,000 (21) ^{f, sol}	92,000 (21) ^{f, sol}	270,000 ^f	1,700,000 ^f	250,000 ^f	480,000 ^f
EC>35-44	2.5%	92,000 (21) ^{f, sol}	92,000 (21) ^{f, sol}	270,000 ^f	1,700,000 ^f	250,000 ^f	480,000 ^f
Aliphatic							
EC 5-6	6%	160	160	3,900	12,000 (1,150) ^{sol}	600,000	180,000 (1,150) ^{sol}
EC>6-8	6%	530	530	13,000	40,000 (736) ^{sol}	620,000	320,000 (736) ^{sol}
EC>8-10	6%	150	150	1,700	11,000 (451) ^{vap}	13,000	21,000 (451) ^{vap}
EC>10-12	6%	760 (283) ^{vap}	760 (283) ^{vap}	7,300	47,000 (283) ^{vap}	13,000	24,000 (283) ^{vap}
EC>12-16	6%	4,300 (142) ^{sol}	4,400 (142) ^{sol}	13,000	90,000 (142) ^{sol}	13,000	26,000 (142) ^{sol}
EC>16-35	6%	110,000 ^f	110,000 ^f	270,000 ^f	1,800,000 ^f	250,000 ^f	490,000 ^f
EC>35-44	6%	110,000 ^f	110,000 ^f	270,000 ^f	1,800,000 ^f	250,000 ^f	490,000 ^f
Aromatic							
EC5-7(benzene as non-threshold)	1%	70	370	13	26,000 (1,220) ^{sol}	56,000	76,000 (1,220) ^{sol}
EC>7-8(toluene)	1%	130	860	22	56,000 (869) ^{vap}	56,000	87,000 (869) ^{vap}
EC>8-10	1%	34	47	8.6	3,500 (613) ^{vap}	5,000	7,200 (613) ^{vap}
EC>10-12	1%	74	250	13	16,000 (364) ^{sol}	5,000	9,200 (364) ^{sol}
EC>12-16	1%	140	1,800	23	36,000 (169) ^{sol}	5,100	10,000
EC>16-21	1%	260 ^f	1,900 ^f	46 ^f	28,000 ^f	3,800 ^f	7,600 ^f
EC>21-35	1%	1,100 ^f	1,900 ^f	370 ^f	28,000 ^f	3,800 ^f	7,800 ^f
EC>35-44	1%	1,100 ^f	1,900 ^f	370 ^f	28,000 ^f	3,800 ^f	7,800 ^f
Aromatic							
EC5-7(benzene as non-threshold)	2.5%	140	690	27	46,000 (2,260) ^{sol}	56,000	84,000 (2,260) ^{sol}
EC>7-8(toluene)	2.5%	290	1,800	51	110,000 (1,920) ^{sol}	56,000	95,000 (1,920) ^{sol}
EC>8-10	2.5%	83	110	21	8,100 (1,500) ^{vap}	5,000	8,500 (1,500) ^{vap}
EC>10-12	2.5%	180	590	31	28,000 (899) ^{sol}	5,000	9,700 (899) ^{sol}
EC>12-16	2.5%	330	2,300 (419) ^{sol}	57	37,000	5,100	10,000
EC>16-21	2.5%	540 ^f	1,900 ^f	110 ^f	28,000 ^f	3,800 ^f	7,700 ^f
EC>21-35	2.5%	1,500 ^f	1,900 ^f	820 ^f	28,000 ^f	3,800 ^f	7,800 ^f
EC>35-44	2.5%	1,500 ^f	1,900 ^f	820 ^f	28,000 ^f	3,800 ^f	7,800 ^f
Aromatic							
EC5-7(benzene as non-threshold)	6%	300	1,400	57	86,000 (4,710) ^{sol}	56,000	92,000 (4,710) ^{sol}
EC>7-8(toluene)	6%	660	3,900	120	180,000 (4,360) ^{vap}	56,000	100,000 (4,360) ^{vap}
EC>8-10	6%	190	270	51	17,000 (3,580) ^{vap}	5,000	9,300 (3,580) ^{vap}
EC>10-12	6%	380	1,200	74	34,000 (2,150) ^{sol}	5,000	10,000
EC>12-16	6%	660	2,500	130	38,000	5,100	10,000
EC>16-21	6%	930 ^f	1,900 ^f	260 ^f	28,000 ^f	3,800 ^f	7,800 ^f
EC>21-35	6%	1,700 ^f	1,900 ^f	1,600 ^f	28,000 ^f	3,800 ^f	7,900 ^f
EC>35-44	6%	1,700 ^f	1,900 ^f	1,600 ^f	28,000 ^f	3,800 ^f	7,900 ^f
Aliphatic +Aromatic >EC44	1%	1,600 ^f	1,900 ^f	1,200 ^f	28,000 ^f	3,800 ^f	7,800 ^f
	2.5%	1,800 ^f	1,900 ^f	2,100 ^f	28,000 ^f	3,800 ^f	7,800 ^f
	6%	1,900 ^f	1,900 ^f	3,000 ^f	28,000 ^f	3,800 ^f	7,900 ^f

NOTES

Sol / vap = solubility / vapour limit (potentially use if free product identified, although highly conservative).

f = oral, dermal and inhalation exposures compared to oral HCV.

All GAC are based on sandy loam soils with a pH 7.

All GAC are based on sandy loam soils with a pH 7.			LQM Generic Assessment Criteria (mg/kg) Dry weight soil					
Contaminant		SOM	Res +	Res -	Allot.	Comm.	POS _{resi}	POS _{park}
Chloalkanes and Alkenes & Explosives	1,2 Dichloroethane (DCA)	1%	7.1E-03	9.2E-03	4.6E-03	0.67	29	21
		2.5%	1.1E-02	1.3E-02	8.3E-03	0.97	29	24
		6%	1.9E-02	2.3E-02	1.6E-02	1.7	29	28
	1,1,1 Trichloroethane (TCA)	1%	8.8	9.0	48	660	140,000	57,000 (1,425) ^{vap}
		2.5%	18	18	110	1,300	140,000	76,000 (2,915) ^{vap}
		6%	39	40	240	3,000	140,000	100,000 (6,392) ^{vap}
	1,1,2,2-Tetrachloroethanes (PCA)	1%	1.6	3.9	0.41	270	1,400	1,800
		2.5%	3.4	8.0	0.89	550	1,400	2,100
		6%	7.5	17	2.0	1,100	1,400	2,300
	1,1,1,2-Tetrachloroethanes (PCA)	1%	1.2	1.5	0.79	110	1,400	1,500
		2.5%	2.8	3.5	1.9	250	1,400	1,800
		6%	6.4	8.2	4.4	560	1,400	2,100
	Tetrachloroethene (PCE)	1%	0.18	0.18	0.65	19	1,400	810 (424) ^{sol}
		2.5%	0.39	0.40	1.5	42	1,400	1,100 (951) ^{sol}
		6%	0.90	0.92	3.6	95	1,400	1,500
	Tetrachloromethane (carbon tetrachloride)	1%	2.6E-02	2.6E-02	0.45	2.9	890	190
		2.5%	5.6E-02	5.6E-02	1.0	6.3	920	270
		6%	0.13	0.13	2.4	14	950	400
	Trichloroethene (TCE)	1%	1.6E-02	1.7E-02	4.1E-02	1.2	120	70
		2.5%	3.4E-02	3.6E-02	9.1E-02	2.6	120	91
		6%	7.5E-02	8.0E-02	0.21	5.7	120	120
	Trichloromethane (chloroform)	1%	0.91	1.2	0.42	99	2,500	2,600
		2.5%	1.7	2.1	0.83	170	2,500	2,800
		6%	3.4	4.2	1.7	350	2,500	3,100
	Chloroethene (vinyl chloride)	1%	6.4E-04	7.7E-04	5.5E-04	5.9E-02	3.5	4.8
		2.5%	8.7E-04	1.0E-03	1.0E-03	7.7E-02	3.5	5.0
		6%	1.4E-03	1.5E-03	1.8E-03	0.12	3.5	5.4
	2,4,6-Trinitrotoluene (TNT)	1%	1.6	65	0.24	1,000	130	260
		2.5%	3.7	66	0.58	1,000	130	270
		6%	8.1	66	1.4	1,000	130	270
	RDX	1%	120	13,000	17	210,000	26,000	49,000 (18.7) ^{sol}
		2.5%	250	13,000	38	210,000	26,000	51,000
		6%	540	13,000	85	210,000	27,000	53,000
	HMX	1%	5.7	6,700	0.86	110,000	13,000	23,000 (0.35) ^{vap}
		2.5%	13	6,700	1.9	110,000	13,000	23,000 (0.39) ^{vap}
		6%	26	6,700	3.9	110,000	13,000	24,000 (0.48) ^{vap}
Pesticides	Aldrin	1%	5.7	7.3	3.2	170	18	30
		2.5%	6.6	7.4	6.1	170	18	31
		6%	7.1	7.5	9.8	170	18	31
	Dieldrin	1%	0.97	7.0	0.17	170	18	30
		2.5%	2.0	7.3	0.41	170	18	30
		6%	3.5	7.4	0.96	170	18	31
	Atrazine	1%	3.3	610	0.5	9,300	1,200	2,300
		2.5%	7.8	620	1.2	9,400	1,200	2,400
		6%	17.4	620	2.7	9,400	1,200	2,400
	Dichlorvos	1%	3.2E-02	6.4	4.9E-03	140	16	26
		2.5%	6.6E-02	6.5	1.0E-02	140	16	26
		6%	0.14	6.6	2.2E-02	140	16	27
	Endosulfanns (2 isomers)	1%	7.4	160 (3.0E-03) ^{vap}	1.2	5,600 (3.0E-03) ^{vap}	1,200	2,300
		2.5%	18	280 (7.0E-03) ^{vap}	2.9	7,400 (7.0E-03) ^{vap}	1,200	2,400
		6%	41	410 (1.6E-02) ^{vap}	6.8	8,400 (1.6E-02) ^{vap}	1,200	2,500
	Hexachlorocyclohexane (3 isomers), inc Lindane	1%	8.5E-02	3.7	1.3E-02	65	8.1	15
		2.5%	0.2	3.8	3.2E-02	65	8.1	15
		6%	0.46	3.8	7.7E-02	65	8.1	16

NOTES

Sol / vap = solubility / vapour limit (potentially use if free product identified, although highly conservative).

All GAC are based on
sandy loam soils with a pH
7.

All GAC are based on sandy loam soils with a pH 7.			LQM Generic Assessment Criteria (mg/kg) Dry weight soil					
Contaminant		SOM	Res +	Res -	Allot.	Comm.	POS _{resi}	POS _{park}
Chlorobenzenes	Chlorobenzene	1%	0.46	0.46	5.9	56	11,000	1,300 (675) ^{sol}
		2.5%	1.0	1.0	14	130	13,000	2,000 (1,520) ^{sol}
		6%	2.4	2.4	32	290	14,000	2,900
	Dichlorobenzenes (3 isomers)	1%	23	24	94	2,000 (571) ^{sol}	90,000	24,000 (571) ^{sol}
		2.5%	55	57	230	4,800 (1,370) ^{sol}	95,000	36,000 (1,370) ^{sol}
		6%	130	130	540	11,000 (3,240) ^{sol}	98,000	51,000 (3,270) ^{sol}
	Trichlorobenzenes (3 isomers)	1%	2.6	2.6	55	220	15,000	1,700 (318) ^{vap}
		2.5%	6.4	6.4	140	530	17,000	2,600 (786) ^{vap}
		6%	15	15	320	1,300	19,000	4,000 (1,880) ^{vap}
	Tetrachlorobenzenes (3 isomers)	1%	0.66	0.75	0.38	49 (39.4) ^{vap}	78	110 (39) ^{vap}
		2.5%	1.6	1.9	0.90	120 (98.1) ^{vap}	79	120
		6%	3.7	4.3	2.2	240 (235) ^{vap}	79	130
	Pentachlorobenzene	1%	5.8	19	1.2	640 (43.0) ^{sol}	100	190
		2.5%	12	30	3.1	770 (107) ^{sol}	100	190
		6%	22	38	7.0	830	100	190
	Hexachlorobenzene	1%	1.8 (0.20) ^{vap}	4.1 (0.20) ^{vap}	0.47	110 (0.20) ^{vap}	16	30
		2.5%	3.3 (0.50) ^{vap}	5.7 (0.50) ^{vap}	1.1	120	16	30
		6%	4.9	6.7 (1.2) ^{vap}	2.5	120	16	30
Chlorophenol	Chlorophenols (4 congeners)	1%	0.87 ^g	94	0.13 ^g	3,500	620	1,100
		2.5%	2.0	150	0.30	4,000	620	1,100
		6%	4.5	210	0.70	4,300	620	1,100
	Pentachlorophenol	1%	0.22	27 (16.4) ^{vap}	3.0E-02	400	60	110
		2.5%	0.52	29	8.0E-02	400	60	120
		6%	1.2	31	0.19	400	60	120
Others	Carbon Disulphide	1%	0.14	0.14	4.8	11	11,000	1,300
		2.5%	0.29	0.29	10	22	11,000	1,900
		6%	0.62	0.62	23	47	11,000	2,700
	Hexachlorobutadiene	1%	0.29	0.32	0.25	31	25	48
		2.5%	0.7	0.78	0.61	66	25	50
		6%	1.6	1.8	1.4	120	25	51
	Phenol	1%	280	750	66	760 ^{dir} (31,000)	760 ^{dir} (11,000)	760 ^{dir} (8,600)
		2.5%	550	1,300	140	1,500 ^{dir} (35,000)	1,500 ^{dir} (11,000)	1,500 ^{dir} (9,700)
		6%	1,100	2,300	280	3,200 ^{dir} (37,000)	3,200 ^{dir} (11,000)	3,200 ^{dir} (11,000)

NOTES

^{Sol / vap} = solubility / vapour limit (potentially use if free product identified, although highly conservative).

^{dir} = S4uls based on threshold protective of direct skin contact with phenol (brackets long term exposure for illustration purposes).

^g = derived based on 2,3,4,6-tetrachlorophenol.

Appendix I

Hazard Index Spreadsheet

$$HI = \sum_{Fi=1}^{16} HQ \text{ Fi} = \frac{\text{Measured concentration Fi (mg/kg)}}{S4UL \text{ Fi (mg/kg)}}$$

where:

HI = Hazard Index

HQ = Hazard Quotient

Fi = Fraction I

S4UL = LQM Suitable 4 Use Levels (S4ULs)

Job

Job No.

SOM

Comment

Whalley Road, Ramsbottom

LKC 21 1680

25.4

WS101 0.3-0.75m

Residential With Plant Uptake								
	1% S4UL	2.50% S4UL	6% S4UL	Max Soil concn.	HQ (1%SOM)	HQ (2.5%SOM)	HQ (6% SOM)	
Aliphatic								
EC5-EC6	42	78	160	0.01	0.0002381	0.0001282	0.0000625	
EC6-EC8	100	230	530	0.05	0.0005	0.0002174	9.434E-05	
EC8-EC10	27	65	150	10	0.3703704	0.1538462	0.0666667	
EC10-EC12	130	330	760	6	0.0461538	0.0181818	0.0078947	
EC12-EC16	1100	2400	4300	6	0.0054545	0.0025	0.0013953	
EC16-EC21								
EC21-EC35	65000	92000	110000	403	0.0062	0.0043804	0.0036636	
EC35-EC44	65000	92000	110000	1	1.538E-05	1.087E-05	9.091E-06	
Aromatic								
EC5-EC7 (benzene)	70	140	300	0.01	0.0001429	7.143E-05	3.333E-05	
EC7-EC8 (tolulene)	130	290	660	0.06	0.0004615	0.0002069	9.091E-05	
EC8-EC10	34	83	190	2	0.0588235	0.0240964	0.0105263	
EC10-EC12	74	180	380	2	0.027027	0.0111111	0.0052632	
EC12-EC16	140	330	660	13	0.0928571	0.0393939	0.019697	
EC16-EC21	260	540	930	115	0.4423077	0.212963	0.1236559	
EC21-EC35	1100	1500	1700	212	0.1927273	0.1413333	0.1247059	
EC35-EC44	1100	1500	1700	1	0.0009091	0.0006667	0.0005882	
					HI	1.24	0.61	0.36

Sample number				MAX or US95
Depth				
Aliphatic				
EC5-EC6				0.01
EC6-EC8				0.05
EC8-EC10				10
EC10-EC12				6
EC12-EC16				6
EC16-EC21				94
EC21-EC35				309
EC35-EC44				1
Aromatic				
EC5-EC7 (benzene)				0.01
EC7-EC8 (tolulene)				0.06
EC8-EC10				2
EC10-EC12				2
EC12-EC16				13
EC16-EC21				115
EC21-EC35				212
EC35-EC44				1
0.00E+00 0.00E+00 0.00E+00 0.00E+00				

Appendix J

JIWG Assessment Output Sheets

Decision Support Tool for Receptor Risk Ranking

Stage 1		Score
Hazard Identification		
Select ACM type (run model for each type to generate 'Worst Case' output)	Free dispersed fibres/fibre bundles	2
Extent of degradation of ACMs	Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Friable ACM or ACM with fibres not linked in any matrix (free dispersed fibres/fibre bundles)	4
Distribution of Visible Asbestos Across Affected Area	No visible ACMs/fibre bundles	0
Asbestos fibre type	Mainly amosite (and possible trace tremolite/anthophyllite) with/without chrysotile (no crocidolite)	3
Sub-total		13
Hazard ranking		Medium

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.
It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.



Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Stage 2		Score
Emission Factors		
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Trace quantities - <0.0001 to <0.001 %wt/wt	0
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Medium	3
Activity type and effect on deterioration of ACMs	Moderate disturbance, slight deterioration expected	3
Best description of primary host material matrix	Coarse to Fine Sand	2
Sub-total		8
Exposure ranking		Low

Stage 3		Score	
Pathway and Receptor Sensitivity			
Receptor category	Residential	No score required	
Age of Receptor	Infant (under 5)	4	
Duration of exposure/site occupancy	>> 10 hours per day (e.g. 24 hour residential exposure)	4	
Receptor ranking		8	High
Combined hazard, exposure and receptor ranking			Medium
Pathway: Distance of Receptor from Source	In or within 10m of area of disturbance	4	
Pathway: Depth to impacted material	Material present near the surface, potential to be disturbed during non-construction/routine use of land	D	
Pathway ranking		4D	Medium
Overall ranking			Medium



Joint Industry Working Group
Asbestos in Soil and Construction & Demolition Materials

Project Reference	LKC 21 1680
Site Name	Whalley Road, Ramsbottom
Client	Steven Mort
Run by	EM
Date	23.03.23
Reviewed by	EK
Characterisation of scenario being evaluated	Current risk to receptors based on the current state of site (no remediation in proposed gardens / areas of soft landscaping)
Interpretation of scenario ranking by DST	Medium risk to receptors.

Decision Support Tool for Receptor Risk Ranking

Stage 1		Score
Hazard Identification		
Select ACM type (run model for each type to generate 'Worst Case' output)	Free dispersed fibres/fibre bundles	2
Extent of degradation of ACMs	Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Friable ACM or ACM with fibres not linked in any matrix (free dispersed fibres/fibre bundles)	4
Distribution of Visible Asbestos Across Affected Area	No visible ACMs/fibre bundles	0
Asbestos fibre type	Mainly amosite (and possible trace tremolite/anthophyllite) with/without chrysotile (no crocidolite)	3
Sub-total		13
Hazard ranking		Medium

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.
It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.



Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Stage 2		Score
Emission Factors		
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Trace quantities - <0.0001 to <0.001 %wt/wt	0
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Medium	3
Activity type and effect on deterioration of ACMs	Moderate disturbance, slight deterioration expected	3
Best description of primary host material matrix	Coarse to Fine Sand	2
Sub-total		8
Exposure ranking		Low

Stage 3		Score	
Pathway and Receptor Sensitivity			
Receptor category	Residential	No score required	
Age of Receptor	Infant (under 5)	4	
Duration of exposure/site occupancy	>> 10 hours per day (e.g. 24 hour residential exposure)	4	
Receptor ranking		8	High
Combined hazard, exposure and receptor ranking			Medium
Pathway: Distance of Receptor from Source	In or within 10m of area of disturbance	4	
Pathway: Depth to impacted material	Material buried at depth, unlikely to be disturbed except for deeper construction related excavation	B	
Pathway ranking		4B	Very Low
Overall ranking			Very Low



Joint Industry Working Group
Asbestos in Soil and Construction & Demolition Materials

Project Reference	LKC 21 1680
Site Name	Whalley Road, Ramsbottom
Client	Steven Mort
Run by	EM
Date	23.03.23
Reviewed by	EK
Characterisation of scenario being evaluated	Risk to receptors once a 600mm environmental cover system is placed in gardens and a 450mm environmental cover system is placed in areas of soft landscaping.
Interpretation of scenario ranking by DST	Very low risk to receptors as trace quantities of asbestos identified, which will be buried at depth beneath the environmental cover system.



Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Project Reference	LKC 21 1680
Site Name	Whalley Road, Ramsbottom
Client	Steven Mort
Run by	EM
Date	23.03.23
Scenario details	Risk during earthworks

Decision Support Tool for CAR2012 Work Categories

Stage 1

Hazard Factors

Select ACM type (run model for each type to generate 'Worst Case' output)
Extent of degradation of ACMs at outset of work
Friability and degree of bonding by matrix (ACM matrix, not ground materials)
Distribution of Visible Asbestos Across Affected Area
Amount of asbestos fibre in selected ACM/fibre type as % of host material

Free dispersed fibres/fibre bundles	2
Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friable ACM or ACM with fibres not linked in any matrix (free dispersed fibres/fibre bundles)	4
No visible ACMs/fibre bundles	0
Trace quantities - <0.0001 to 0.001 %wt/wt	0

Score

Sub-total

0

Note: the asbestos licensing regime is unaffected by the type of asbestos fibre present in ACMs

Hazard ranking

Negligible

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.

It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.

Stage 2

Exposure Factors

Score

Anticipated airborne fibre concentration - Control Limit or SALI?
 Anticipated duration of exposure to asbestos
 Activity type and effect on deterioration of ACMs during work
 Best description of primary host material matrix (soil/made ground)
 Respirable fibre index for ACM - RIVM report 711701034 (2003)

<0.01 fibres/ml	1
> 2 hours in a 7 day period and Up to 10 hours in a day (e.g. full time occupational exposure)	4
Not low intensity, significant deterioration expected	4
Coarse to Fine Sand	2
Medium	3

Sub-total

14

Exposure ranking

Medium

Combined hazard and exposure ranking

14

Low

Stage 3

Risk Assessment Outputs

Probable Licensing Status	CAR do not apply
RPE*	None
Dust Suppression**	None
Hygiene/Decontamination***	None

*Where RPE has to be worn continuously for long periods (e.g. more than 1-hour), then powered RPE may be necessary.

**Reduction in control measures possible if natural mitigation factors are present (e.g. raining, wet ground)

***Guide only; suitability of selected personal hygiene measures may be reviewed on a site/contamination-specific basis

Appendix K

HazWasteOnline Output Sheets

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)



F11V8-RP00E-OIZE9

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

Job name

LKC 21 1680

Description/Comments

Project

LKC 21 1680

Site

Whalley Road, Ramsbottom

Classified by

Name: **Peter Dunn**
 Date: **23 Mar 2023 08:10 GMT**
 Telephone: **0161 763 7200**

Company: **LK Group**

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:

CERTIFIED

Course

Hazardous Waste Classification
 Most recent 3 year Refresher

Date

18 Sep 2019
 02 Aug 2022

Next 3 year Refresher due by Aug 2025

Purpose of classification

2 - Material Characterisation

Address of the waste

391 Whalley Road, Ramsbottom,

Post Code **BL0 0ER**

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Redevelopment of brownfield land

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

Construction

Description of the waste

Made Ground and Soil

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	HD101-0.00 - 0.20-02/03/2023	0.00 - 0.20	Non Hazardous		3
2	WS101-0.30 - 0.75-02/03/2023	0.30 - 0.75	Hazardous	HP 10, HP 14	5
3	WS101-0.75 - 1.00-02/03/2023	0.75 - 1.00	Non Hazardous		11
4	WS101-2.50 - 3.00-02/03/2023	2.50 - 3.00	Non Hazardous		17
5	WS102-0.05 - 0.80-02/03/2023	0.05 - 0.80	Non Hazardous		18
6	WS102-0.80 - 1.10-02/03/2023	0.80 - 1.10	Non Hazardous		21
7	WS103-0.20 - 1.20-02/03/2023	0.20 - 1.20	Non Hazardous		22
8	WS103-1.70 - 2.00-02/03/2023	1.70 - 2.00	Non Hazardous		24
9	WS104-0.00 - 0.55-02/03/2023	0.00 - 0.55	Non Hazardous		26
10	WS104-0.80 - 1.50-02/03/2023	0.80 - 1.50	Non Hazardous		28
11	WS104-3.00 - 4.00-02/03/2023	3.00 - 4.00	Hazardous	HP 14	30
12	WS105-3.00 - 4.00-02/03/2023	3.00 - 4.00	Non Hazardous		36
13	WS105-4.20 - 5.00-02/03/2023	4.20 - 5.00	Non Hazardous		38

Related documents

#	Name	Description
1	23-03215.1.hwol	DETS South .hwol file used to populate the Job
2	LK SUITE 1 - 5	waste stream template used to create this Job

Report

Created by: Peter Dunn

Created date: 23 Mar 2023 08:10 GMT

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Classification of sample: HD101-0.00 - 0.20-02/03/2023

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

Sample details

Sample name:	LoW Code:
HD101-0.00 - 0.20-02/03/2023	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.00 - 0.20 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
18%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 18% 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 }				59 mg/kg	1.32	63.877 mg/kg	0.00639 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
2		cadmium { cadmium oxide }				0.7 mg/kg	1.142	0.656 mg/kg	0.0000656 %	✓		
		048-002-00-0	215-146-2	1306-19-0								
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				100 mg/kg	1.462	119.848 mg/kg	0.012 %	✓		
			215-160-9	1308-38-9								
4		copper { dicopper oxide; copper (I) oxide }				174 mg/kg	1.126	160.642 mg/kg	0.0161 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
5		mercury { mercury dichloride }				<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD	
		080-010-00-X	231-299-8	7487-94-7								
6		nickel { nickel(II) oxide (nickel monoxide) }				36 mg/kg	1.273	37.567 mg/kg	0.00376 %	✓		
		028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]								
7		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	195 mg/kg		159.9 mg/kg	0.016 %	✓		
		082-001-00-6										
8		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<2 mg/kg	1.405	<2.81 mg/kg	<0.000281 %		<LOD	
		034-002-00-8										
9		vanadium { divanadium pentaoxide; vanadium pentoxide }				170 mg/kg	1.785	248.855 mg/kg	0.0249 %	✓		
		023-001-00-8	215-239-8	1314-62-1								
10		zinc { zinc oxide }				158 mg/kg	1.245	161.265 mg/kg	0.0161 %	✓		
		030-013-00-7	215-222-5	1314-13-2								
11		chromium in chromium(VI) compounds { chromium(VI) oxide }				<2 mg/kg	1.923	<3.846 mg/kg	<0.000385 %		<LOD	
		024-001-00-0	215-607-8	1333-82-0								
12		pH		PH		7.9 pH		7.9 pH	7.9 pH			
13		naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD	
		601-052-00-2	202-049-5	91-20-3								

#	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							
14	acenaphthylene	205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
15	acenaphthene	201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
16	fluorene	201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
17	phenanthrene	201-581-5	85-01-8		0.6 mg/kg		0.492 mg/kg	0.0000492 %	✓	
18	anthracene	204-371-1	120-12-7		0.15 mg/kg		0.123 mg/kg	0.0000123 %	✓	
19	fluoranthene	205-912-4	206-44-0		1.45 mg/kg		1.189 mg/kg	0.000119 %	✓	
20	pyrene	204-927-3	129-00-0		1.34 mg/kg		1.099 mg/kg	0.00011 %	✓	
21	benzo[a]anthracene	601-033-00-9	200-280-6		0.82 mg/kg		0.672 mg/kg	0.0000672 %	✓	
22	chrysene	601-048-00-0	205-923-4		0.78 mg/kg		0.64 mg/kg	0.000064 %	✓	
23	benzo[b]fluoranthene	601-034-00-4	205-911-9		1.35 mg/kg		1.107 mg/kg	0.000111 %	✓	
24	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.48 mg/kg		0.394 mg/kg	0.0000394 %	✓	
25	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		1.3 mg/kg		1.066 mg/kg	0.000107 %	✓	
26	indeno[123-cd]pyrene	205-893-2	193-39-5		0.7 mg/kg		0.574 mg/kg	0.0000574 %	✓	
27	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
28	benzo[ghi]perylene	205-883-8	191-24-2		0.48 mg/kg		0.394 mg/kg	0.0000394 %	✓	
29	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:								0.0979 %		

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
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS101-0.30 - 0.75-02/03/2023

 **Hazardous Waste**
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:	LoW Code:
WS101-0.30 - 0.75-02/03/2023	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 03 * (Soil and stones containing hazardous substances)
0.30 - 0.75 m	
Moisture content:	
35.8%	
(wet weight correction)	

Hazard properties

HP 10: Toxic for reproduction "waste which has adverse effects on sexual function and fertility in adult males and females, as well as developmental toxicity in the offspring"

Hazard Statements hit:

Repr. 1B; H360FD "May damage fertility. May damage the unborn child."

Because of determinand:

chromium(III) oxide (worst case): (compound conc.: 0.682%)

HP 14: Ecotoxic "waste which presents or may present immediate or delayed risks for one or more sectors of the environment"

Hazard Statements hit:

Aquatic Chronic 1; H410 "Very toxic to aquatic life with long lasting effects."

Because of determinand:

chromium(III) oxide (worst case): (compound conc.: 0.682%)

Determinands

Moisture content: 35.8% 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 }				23	mg/kg	1.32	19.496	mg/kg	0.00195 %	✓	
		033-003-00-0	215-481-4	1327-53-3									
2		cadmium { cadmium oxide }				2.6	mg/kg	1.142	1.907	mg/kg	0.000191 %	✓	
		048-002-00-0	215-146-2	1306-19-0									
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				7270	mg/kg	1.462	6821.578	mg/kg	0.682 %	✓	
			215-160-9	1308-38-9									
4		copper { dicopper oxide; copper (I) oxide }				894	mg/kg	1.126	646.201	mg/kg	0.0646 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
5		mercury { mercury dichloride }				<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
6		nickel { nickel(II) oxide (nickel monoxide) }				25	mg/kg	1.273	20.425	mg/kg	0.00204 %	✓	
		028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]									
7		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	730	mg/kg		468.66	mg/kg	0.0469 %	✓	
		082-001-00-6											

#	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									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<2	mg/kg	1.405	<2.81	mg/kg	<0.000281 %		<LOD
	034-002-00-8											
9	vanadium { divanadium pentaoxide; vanadium pentoxide }				48	mg/kg	1.785	55.012	mg/kg	0.0055 %	✓	
	023-001-00-8	215-239-8	1314-62-1									
10	zinc { zinc oxide }				676	mg/kg	1.245	540.196	mg/kg	0.054 %	✓	
	030-013-00-7	215-222-5	1314-13-2									
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<2	mg/kg	1.923	<3.846	mg/kg	<0.000385 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
12	boron { diboron trioxide; boric oxide }				<1	mg/kg	3.22	<3.22	mg/kg	<0.000322 %		<LOD
	005-008-00-8	215-125-8	1303-86-2									
13	TPH (C6 to C40) petroleum group		TPH		765	mg/kg		491.13	mg/kg	0.0491 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
15	benzene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
16	toluene				0.059	mg/kg		0.0379	mg/kg	0.00000379 %	✓	
	601-021-00-3	203-625-9	108-88-3									
17	ethylbenzene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
	601-023-00-4	202-849-4	100-41-4									
18	xylene				0.088	mg/kg		0.0565	mg/kg	0.00000565 %	✓	
	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]									
19	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 }				61	mg/kg	1.884	73.781	mg/kg	0.00738 %	✓	
	006-007-00-5											
20	pH		PH		7.6	pH		7.6	pH	7.6 pH		
21	naphthalene				0.33	mg/kg		0.212	mg/kg	0.0000212 %	✓	
	601-052-00-2	202-049-5	91-20-3									
22	acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		205-917-1	208-96-8									
23	acenaphthene				1.15	mg/kg		0.738	mg/kg	0.0000738 %	✓	
		201-469-6	83-32-9									
24	fluorene				0.76	mg/kg		0.488	mg/kg	0.0000488 %	✓	
		201-695-5	86-73-7									
25	phenanthrene				5.6	mg/kg		3.595	mg/kg	0.00036 %	✓	
		201-581-5	85-01-8									
26	anthracene				2.12	mg/kg		1.361	mg/kg	0.000136 %	✓	
		204-371-1	120-12-7									
27	fluoranthene				6.86	mg/kg		4.404	mg/kg	0.00044 %	✓	
		205-912-4	206-44-0									
28	pyrene				5.83	mg/kg		3.743	mg/kg	0.000374 %	✓	
		204-927-3	129-00-0									
29	benzo[a]anthracene				2.1	mg/kg		1.348	mg/kg	0.000135 %	✓	
	601-033-00-9	200-280-6	56-55-3									
30	chrysene				2.07	mg/kg		1.329	mg/kg	0.000133 %	✓	
	601-048-00-0	205-923-4	218-01-9									
31	benzo[b]fluoranthene				1.81	mg/kg		1.162	mg/kg	0.000116 %	✓	
	601-034-00-4	205-911-9	205-99-2									
32	benzo[k]fluoranthene				0.51	mg/kg		0.327	mg/kg	0.0000327 %	✓	
	601-036-00-5	205-916-6	207-08-9									

#	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							
33	benzo[a]pyrene; benzo[def]chrysene				1.43 mg/kg		0.918 mg/kg	0.0000918 %	✓	
	601-032-00-3	200-028-5	50-32-8							
34	indeno[123-cd]pyrene				0.41 mg/kg		0.263 mg/kg	0.0000263 %	✓	
		205-893-2	193-39-5							
35	dibenz[a,h]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
36	benzo[ghi]perylene				0.3 mg/kg		0.193 mg/kg	0.0000193 %	✓	
		205-883-8	191-24-2							
37	chloromethane; methyl chloride				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-001-00-7	200-817-4	74-87-3							
38	vinyl chloride; chloroethylene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-023-00-7	200-831-0	75-01-4							
39	bromomethane; methylbromide				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-002-00-2	200-813-2	74-83-9							
40	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3							
41	tetrachloroethylene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-028-00-4	204-825-9	127-18-4							
42	carbon tetrachloride; tetrachloromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-008-00-5	200-262-8	56-23-5							
43	trichloroethylene; trichloroethene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-027-00-9	201-167-4	79-01-6							
44	hexachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-065-00-6	204-273-9	118-74-1							
45	phenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
46	bromoform; tribromomethane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-007-00-X	200-854-6	75-25-2							
47	dibromomethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-003-00-8	200-824-2	74-95-3							
48	dichlorodifluoromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		200-893-9	75-71-8							
49	chloroethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-009-00-0	200-830-5	75-00-3							
50	trichlorofluoromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		200-892-3	75-69-4							
51	1,1-dichloroethylene; vinylidene chloride				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-025-00-8	200-864-0	75-35-4							
52	2,2-dichloropropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		209-832-0	594-20-7							
53	chloroform; trichloromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-006-00-4	200-663-8	67-66-3							
54	bromochloromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		200-826-3	74-97-5							
55	1,1,1-trichloroethane; methyl chloroform				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-013-00-2	200-756-3	71-55-6							
56	1,1-dichloropropene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-031-00-0	209-253-3	563-58-6							
57	1,2-dichloropropane; propylene dichloride				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-020-00-0	201-152-2	78-87-5							
58	bromodichloromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		200-856-7	75-27-4							
59	2-methoxy-2-methylbutane; tert-amyl methyl ether				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-213-00-2	213-611-4	994-05-8							
60	1,3-dichloropropene; [1] (Z)-1,3-dichloropropene [2]				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-030-00-5	208-826-5 [1] 233-195-8 [2]	542-75-6 [1] 10061-01-5 [2]							
61	trans-1,3-dichloropropene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		431-460-4	10061-02-6							

#	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							
62	1,1,2-trichloroethane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-014-00-8	201-166-9	79-00-5							
63	1,3-dichloropropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		205-531-3	142-28-9							
64	dibromochloromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		204-704-0	124-48-1							
65	1,2-dibromoethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-010-00-6	203-444-5	106-93-4							
66	chlorobenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-033-00-1	203-628-5	108-90-7							
67	1,1,1,2-tetrachloroethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		211-135-1	630-20-6							
68	styrene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-026-00-0	202-851-5	100-42-5							
69	1,1,2,2-tetrachloroethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-015-00-3	201-197-8	79-34-5							
70	1,2,3-trichloropropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-062-00-X	202-486-1	96-18-4							
71	bromobenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-060-00-9	203-623-8	108-86-1							
72	mesitylene; 1,3,5-trimethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-025-00-5	203-604-4	108-67-8							
73	tert-butylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		202-632-4	98-06-6							
74	1,2,4-trimethylbenzene				0.044 mg/kg		0.0282 mg/kg	0.00000282 %	✓	
	601-043-00-3	202-436-9	95-63-6							
75	sec-butylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		205-227-0	135-98-8							
76	4-isopropyltoluene				0.11 mg/kg		0.0706 mg/kg	0.00000706 %	✓	
		202-796-7	99-87-6							
77	1,3-dichlorobenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-067-00-7	208-792-1	541-73-1							
78	1,4-dichlorobenzene; p-dichlorobenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-035-00-2	203-400-5	106-46-7							
79	n-butylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		203-209-7	104-51-8							
80	1,2-dichlorobenzene; o-dichlorobenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-034-00-7	202-425-9	95-50-1							
81	1,2-dibromo-3-chloropropane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-021-00-6	202-479-3	96-12-8							
82	hexachlorobutadiene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		201-765-5	87-68-3							
83	1,2,4-trichlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-087-00-6	204-428-0	120-82-1							
84	2-nitrophenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-857-5	88-75-5							
85	nitrobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	609-003-00-7	202-716-0	98-95-3							
86	bis(2-chloroethoxy)methane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		203-920-2	111-91-1							
87	bis(2-chloroethyl) ether				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	603-029-00-2	203-870-1	111-44-4							
88	2,4-dichlorophenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	604-011-00-7	204-429-6	120-83-2							
89	2-chlorophenol; [1] 4-chlorophenol; [2] 3-chlorophenol; [3] chlorophenol [4]				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	604-008-00-0	202-433-2 [1] 203-402-6 [2] 203-582-6 [3] 246-691-4 [4]	95-57-8 [1] 106-48-9 [2] 108-43-0 [3] 25167-80-0 [4]							

#	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							
90	3,4-xylene; [1] 2,5-xylene; [2] 2,4-xylene; [3] 2,3-xylene; [4] 2,6-xylene; [5] xylene; [6] 2,4(or 2,5)-xylene [7]	604-006-00-X	202-439-5 [1] 202-461-5 [2] 203-321-6 [3] 208-395-3 [4] 209-400-1 [5] 215-089-3 [6] 276-245-4 [7]	95-65-8 [1] 95-87-4 [2] 105-67-9 [3] 526-75-0 [4] 576-26-1 [5] 1300-71-6 [6] 71975-58-1 [7]	<0.15 mg/kg		<0.15 mg/kg	<0.000015 %		<LOD
91	3,5,5-trimethylcyclohex-2-enone; isophorone	606-012-00-8	201-126-0	78-59-1	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
92	hexachloroethane	200-666-4	67-72-1		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
93	2,4,6-trichlorophenol	604-018-00-5	201-795-9	88-06-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
94	2,4,5-trichlorophenol	604-017-00-X	202-467-8	95-95-4	<0.15 mg/kg		<0.15 mg/kg	<0.000015 %		<LOD
95	chlorocresol; 4-chloro-m-cresol; 4-chloro-3-methylphenol	604-014-00-3	200-431-6	59-50-7	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
96	2-methyl naphthalene	202-078-3	91-57-6		0.4 mg/kg		0.257 mg/kg	0.0000257 %	✓	
97	hexachlorocyclopentadiene	602-078-00-7	201-029-3	77-47-4	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
98	2,6-dinitrotoluene	609-049-00-8	210-106-0	606-20-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
99	dimethyl phthalate	205-011-6	131-11-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
100	2-chloronaphthalene	202-079-9	91-58-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
101	4-chloroaniline	612-137-00-9	203-401-0	106-47-8	<0.15 mg/kg		<0.15 mg/kg	<0.000015 %		<LOD
102	4-nitrophenol; p-nitrophenol	609-015-00-2	202-811-7	100-02-7	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
103	4-chlorophenylphenylether	230-281-7	7005-72-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
104	4-bromophenylphenylether	202-952-4	101-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
105	2,4-dinitrotoluene; [1] dinitrotoluene [2]	609-007-00-9	204-450-0 [1] 246-836-1 [2]	121-14-2 [1] 25321-14-6 [2]	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
106	diethyl phthalate	201-550-6	84-66-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
107	dibenzofuran	205-071-3	132-64-9		0.5 mg/kg		0.321 mg/kg	0.0000321 %	✓	
108	azobenzene	611-001-00-6	203-102-5	103-33-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
109	dibutyl phthalate; DBP	607-318-00-4	201-557-4	84-74-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
110	carbazole	201-696-0	86-74-8		0.7 mg/kg		0.449 mg/kg	0.0000449 %	✓	
111	bis(2-ethylhexyl) phthalate; di-(2-ethylhexyl) phthalate; DEHP	607-317-00-9	204-211-0	117-81-7	<0.15 mg/kg		<0.15 mg/kg	<0.000015 %		<LOD
112	BBP; benzyl butyl phthalate	607-430-00-3	201-622-7	85-68-7	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
113	di-n-octyl phthalate	204-214-7	117-84-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
114	monohydric phenols		P1186		7.2 mg/kg		4.622 mg/kg	0.000462 %	✓	

#	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							
115	m-cresol; [1] o-cresol; [2] p-cresol; [3] mix-cresol [4] 604-004-00-9	203-577-9 [1] 202-423-8 [2] 203-398-6 [3] 215-293-2 [4]	108-39-4 [1] 95-48-7 [2] 106-44-5 [3] 1319-77-3 [4]		1.28 mg/kg		0.822 mg/kg	0.0000822 %	✓	
116	1,2-dichloroethylene; [1] cis-dichloroethylene; [2] trans-dichloroethylene [3] 602-026-00-3	208-750-2 [1] 205-859-7 [2] 205-860-2 [3]	540-59-0 [1] 156-59-2 [2] 156-60-5 [3]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
117	cumene; [1] propylbenzene [2] 601-024-00-X	202-704-5 [1] 203-132-9 [2]	98-82-8 [1] 103-65-1 [2]		0.075 mg/kg		0.0482 mg/kg	0.00000482 %	✓	
118	2-chlorotoluene; [1] 3-chlorotoluene; [2] 4-chlorotoluene; [3] chlorotoluene [4] 602-040-00-X	202-424-3 [1] 203-580-5 [2] 203-397-0 [3] 246-698-2 [4]	95-49-8 [1] 108-41-8 [2] 106-43-4 [3] 25168-05-2 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
119	o-nitroaniline; [1] m-nitroaniline; [2] p-nitroaniline [3] 612-012-00-9	201-855-4 [1] 202-729-1 [2] 202-810-1 [3]	88-74-4 [1] 99-09-2 [2] 100-01-6 [3]		<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
Total:								0.918 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	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
ND	Not detected
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 because Concentrations at less than 1.0% are "unlikely to be flammable". Flammability of soils is unlikely to result in a hazardous classification in soils (AGS Waste Classification – A Practitioner's Guide).

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene: (conc.: 3.79e-06%)

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

Because of determinands:

TPH (C6 to C40) petroleum group: (conc.: 0.0491%)

xylene: (conc.: 5.65e-06%)

1,2,4-trimethylbenzene: (conc.: 2.82e-06%)

4-isopropyltoluene: (conc.: 7.06e-06%)

cumene; [1] propylbenzene [2]: (conc.: 4.82e-06%)

Classification of sample: WS101-0.75 - 1.00-02/03/2023

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

Sample details

Sample name:	LoW Code:
WS101-0.75 - 1.00-02/03/2023	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.75 - 1.00 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
21%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 21% 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 mg/kg	1.32	8.344 mg/kg	0.000834 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %		<LOD
	048-002-00-0	215-146-2	1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				62 mg/kg	1.462	71.587 mg/kg	0.00716 %	✓	
		215-160-9	1308-38-9							
4	copper { dicopper oxide; copper (I) oxide }				16 mg/kg	1.126	14.231 mg/kg	0.00142 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
5	mercury { mercury dichloride }				<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
6	nickel { nickel(II) oxide (nickel monoxide) }				12 mg/kg	1.273	12.064 mg/kg	0.00121 %	✓	
	028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	22 mg/kg		17.38 mg/kg	0.00174 %	✓	
	082-001-00-6									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<2 mg/kg	1.405	<2.81 mg/kg	<0.000281 %		<LOD
	034-002-00-8									
9	vanadium { divanadium pentaoxide; vanadium pentoxide }				28 mg/kg	1.785	39.488 mg/kg	0.00395 %	✓	
	023-001-00-8	215-239-8	1314-62-1							
10	zinc { zinc oxide }				41 mg/kg	1.245	40.316 mg/kg	0.00403 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<2 mg/kg	1.923	<3.846 mg/kg	<0.000385 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
12	boron { diboron trioxide; boric oxide }				<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
13	TPH (C6 to C40) petroleum group				<42 mg/kg		<42 mg/kg	<0.0042 %		<LOD
			TPH							

#	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								
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
15	benzene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
	601-020-00-8	200-753-7	71-43-2								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %			<LOD
	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]								
19	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 }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
	006-007-00-5										
20	pH				7.3 pH		7.3 pH	7.3 pH			
			PH								
21	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.13 mg/kg		0.103 mg/kg	0.0000103 %		✓	
		205-912-4	206-44-0								
28	pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		204-927-3	129-00-0								
29	benzo[a]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-883-8	191-24-2								
37	chloromethane; methyl chloride				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	602-001-00-7	200-817-4	74-87-3								
38	vinyl chloride; chloroethylene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	602-023-00-7	200-831-0	75-01-4								
39	bromomethane; methylbromide				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	602-002-00-2	200-813-2	74-83-9								

#	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							
40	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3							
41	tetrachloroethylene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-028-00-4	204-825-9	127-18-4							
42	carbon tetrachloride; tetrachloromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-008-00-5	200-262-8	56-23-5							
43	trichloroethylene; trichloroethene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-027-00-9	201-167-4	79-01-6							
44	hexachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-065-00-6	204-273-9	118-74-1							
45	phenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
46	bromoform; tribromomethane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-007-00-X	200-854-6	75-25-2							
47	dibromomethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-003-00-8	200-824-2	74-95-3							
48	dichlorodifluoromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		200-893-9	75-71-8							
49	chloroethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-009-00-0	200-830-5	75-00-3							
50	trichlorofluoromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		200-892-3	75-69-4							
51	1,1-dichloroethylene; vinylidene chloride				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-025-00-8	200-864-0	75-35-4							
52	2,2-dichloropropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		209-832-0	594-20-7							
53	chloroform; trichloromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-006-00-4	200-663-8	67-66-3							
54	bromochloromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		200-826-3	74-97-5							
55	1,1,1-trichloroethane; methyl chloroform				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-013-00-2	200-756-3	71-55-6							
56	1,1-dichloropropene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-031-00-0	209-253-3	563-58-6							
57	1,2-dichloropropane; propylene dichloride				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-020-00-0	201-152-2	78-87-5							
58	bromodichloromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		200-856-7	75-27-4							
59	2-methoxy-2-methylbutane; tert-amyl methyl ether				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-213-00-2	213-611-4	994-05-8							
60	1,3-dichloropropene; [1] (Z)-1,3-dichloropropene [2]				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-030-00-5	208-826-5 [1] 233-195-8 [2]	542-75-6 [1] 10061-01-5 [2]							
61	trans-1,3-dichloropropene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		431-460-4	10061-02-6							
62	1,1,2-trichloroethane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-014-00-8	201-166-9	79-00-5							
63	1,3-dichloropropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		205-531-3	142-28-9							
64	dibromochloromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		204-704-0	124-48-1							
65	1,2-dibromoethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-010-00-6	203-444-5	106-93-4							
66	chlorobenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-033-00-1	203-628-5	108-90-7							
67	1,1,1,2-tetrachloroethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		211-135-1	630-20-6							
68	styrene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-026-00-0	202-851-5	100-42-5							

#	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							
69	1,1,2,2-tetrachloroethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-015-00-3	201-197-8	79-34-5							
70	1,2,3-trichloropropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-062-00-X	202-486-1	96-18-4							
71	bromobenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-060-00-9	203-623-8	108-86-1							
72	mesitylene; 1,3,5-trimethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-025-00-5	203-604-4	108-67-8							
73	tert-butylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		202-632-4	98-06-6							
74	1,2,4-trimethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-043-00-3	202-436-9	95-63-6							
75	sec-butylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		205-227-0	135-98-8							
76	4-isopropyltoluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		202-796-7	99-87-6							
77	1,3-dichlorobenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-067-00-7	208-792-1	541-73-1							
78	1,4-dichlorobenzene; p-dichlorobenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-035-00-2	203-400-5	106-46-7							
79	n-butylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		203-209-7	104-51-8							
80	1,2-dichlorobenzene; o-dichlorobenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-034-00-7	202-425-9	95-50-1							
81	1,2-dibromo-3-chloropropane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-021-00-6	202-479-3	96-12-8							
82	hexachlorobutadiene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		201-765-5	87-68-3							
83	1,2,4-trichlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-087-00-6	204-428-0	120-82-1							
84	2-nitrophenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-857-5	88-75-5							
85	nitrobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	609-003-00-7	202-716-0	98-95-3							
86	bis(2-chloroethoxy)methane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		203-920-2	111-91-1							
87	bis(2-chloroethyl) ether				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	603-029-00-2	203-870-1	111-44-4							
88	2,4-dichlorophenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	604-011-00-7	204-429-6	120-83-2							
89	2-chlorophenol; [1] 4-chlorophenol; [2] 3-chlorophenol; [3] chlorophenol [4]				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	604-008-00-0	202-433-2 [1] 203-402-6 [2] 203-582-6 [3] 246-691-4 [4]	95-57-8 [1] 106-48-9 [2] 108-43-0 [3] 25167-80-0 [4]							
90	3,4-xyleneol; [1] 2,5-xyleneol; [2] 2,4-xyleneol; [3] 2,3-xyleneol; [4] 2,6-xyleneol; [5] xyleneol; [6] 2,4(or 2,5)-xyleneol [7]				<0.15 mg/kg		<0.15 mg/kg	<0.000015 %		<LOD
	604-006-00-X	202-439-5 [1] 202-461-5 [2] 203-321-6 [3] 208-395-3 [4] 209-400-1 [5] 215-089-3 [6] 276-245-4 [7]	95-65-8 [1] 95-87-4 [2] 105-67-9 [3] 526-75-0 [4] 576-26-1 [5] 1300-71-6 [6] 71975-58-1 [7]							
91	3,5,5-trimethylcyclohex-2-enone; isophorone				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	606-012-00-8	201-126-0	78-59-1							
92	hexachloroethane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		200-666-4	67-72-1							
93	2,4,6-trichlorophenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	604-018-00-5	201-795-9	88-06-2							

#	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							
94	2,4,5-trichlorophenol				<0.15 mg/kg		<0.15 mg/kg	<0.000015 %		<LOD
	604-017-00-X	202-467-8	95-95-4							
95	chlorocresol; 4-chloro-m-cresol; 4-chloro-3-methylphenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	604-014-00-3	200-431-6	59-50-7							
96	2-methyl naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		202-078-3	91-57-6							
97	hexachlorocyclopentadiene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-078-00-7	201-029-3	77-47-4							
98	2,6-dinitrotoluene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	609-049-00-8	210-106-0	606-20-2							
99	dimethyl phthalate				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-011-6	131-11-3							
100	2-chloronaphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		202-079-9	91-58-7							
101	4-chloroaniline				<0.15 mg/kg		<0.15 mg/kg	<0.000015 %		<LOD
	612-137-00-9	203-401-0	106-47-8							
102	4-nitrophenol; p-nitrophenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	609-015-00-2	202-811-7	100-02-7							
103	4-chlorophenylphenylether				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		230-281-7	7005-72-3							
104	4-bromophenylphenylether				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		202-952-4	101-55-3							
105	2,4-dinitrotoluene; [1] dinitrotoluene [2]				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	609-007-00-9	204-450-0 [1] 246-836-1 [2]	121-14-2 [1] 25321-14-6 [2]							
106	diethyl phthalate				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-550-6	84-66-2							
107	dibenzofuran				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-071-3	132-64-9							
108	azobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	611-001-00-6	203-102-5	103-33-3							
109	dibutyl phthalate; DBP				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	607-318-00-4	201-557-4	84-74-2							
110	carbazole				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-696-0	86-74-8							
111	bis(2-ethylhexyl) phthalate; di-(2-ethylhexyl) phthalate; DEHP				<0.15 mg/kg		<0.15 mg/kg	<0.000015 %		<LOD
	607-317-00-9	204-211-0	117-81-7							
112	BBP; benzyl butyl phthalate				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	607-430-00-3	201-622-7	85-68-7							
113	di-n-octyl phthalate				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		204-214-7	117-84-0							
114	monohydric phenols				<2 mg/kg		<2 mg/kg	<0.0002 %		<LOD
			P1186							
115	m-cresol; [1] o-cresol; [2] p-cresol; [3] mix-cresol [4]				<0.25 mg/kg		<0.25 mg/kg	<0.000025 %		<LOD
	604-004-00-9	203-577-9 [1] 202-423-8 [2] 203-398-6 [3] 215-293-2 [4]	108-39-4 [1] 95-48-7 [2] 106-44-5 [3] 1319-77-3 [4]							
116	1,2-dichloroethylene; [1] cis-dichloroethylene; [2] trans-dichloroethylene [3]				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-026-00-3	208-750-2 [1] 205-859-7 [2] 205-860-2 [3]	540-59-0 [1] 156-59-2 [2] 156-60-5 [3]							
117	cumene; [1] propylbenzene [2]				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-024-00-X	202-704-5 [1] 203-132-9 [2]	98-82-8 [1] 103-65-1 [2]							
118	2-chlorotoluene; [1] 3-chlorotoluene; [2] 4-chlorotoluene; [3] chlorotoluene [4]				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-040-00-X	202-424-3 [1] 203-580-5 [2]	95-49-8 [1] 108-41-8 [2]							

#	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							
		203-397-0 [3] 246-698-2 [4]	106-43-4 [3] 25168-05-2 [4]							
119	o-nitroaniline; [1] m-nitroaniline; [2] p-nitroaniline [3] 612-012-00-9	201-855-4 [1] 202-729-1 [2] 202-810-1 [3]	88-74-4 [1] 99-09-2 [2] 100-01-6 [3]		<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
Total:								0.0267 %		

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
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS101-2.50 - 3.00-02/03/2023

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

Sample details

Sample name:	LoW Code:
WS101-2.50 - 3.00-02/03/2023	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
2.50 - 3.00 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
11.9%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 11.9% 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	• pH				7.1 pH		7.1 pH	7.1 pH		
Total:								0%		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS102-0.05 - 0.80-02/03/2023

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

Sample details

Sample name:	LoW Code:
WS102-0.05 - 0.80-02/03/2023	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.05 - 0.80 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
18.6%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 18.6% 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 }				27 mg/kg	1.32	29.018 mg/kg	0.0029 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
2		cadmium { cadmium oxide }				0.8 mg/kg	1.142	0.744 mg/kg	0.0000744 %	✓		
		048-002-00-0	215-146-2	1306-19-0								
3		chromium in chromium(III) compounds {  chromium(III) oxide (worst case) }				284 mg/kg	1.462	337.877 mg/kg	0.0338 %	✓		
			215-160-9	1308-38-9								
4		copper { dicopper oxide; copper (I) oxide }				100 mg/kg	1.126	91.647 mg/kg	0.00916 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
5		mercury { mercury dichloride }				<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD	
		080-010-00-X	231-299-8	7487-94-7								
6		nickel { nickel(II) oxide (nickel monoxide) }				24 mg/kg	1.273	24.861 mg/kg	0.00249 %	✓		
		028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]								
7		lead {  lead compounds with the exception of those specified elsewhere in this Annex }			1	248 mg/kg		201.872 mg/kg	0.0202 %	✓		
		082-001-00-6										
8		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<2 mg/kg	1.405	<2.81 mg/kg	<0.000281 %		<LOD	
		034-002-00-8										
9		vanadium {  divanadium pentaoxide; vanadium pentoxide }				37 mg/kg	1.785	53.766 mg/kg	0.00538 %	✓		
		023-001-00-8	215-239-8	1314-62-1								
10		zinc { zinc oxide }				125 mg/kg	1.245	126.65 mg/kg	0.0127 %	✓		
		030-013-00-7	215-222-5	1314-13-2								
11		chromium in chromium(VI) compounds { chromium(VI) oxide }				<2 mg/kg	1.923	<3.846 mg/kg	<0.000385 %		<LOD	
		024-001-00-0	215-607-8	1333-82-0								
12		boron { diboron trioxide ; boric oxide }				<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %		<LOD	
		005-008-00-8	215-125-8	1303-86-2								
13		TPH (C6 to C40) petroleum group				88 mg/kg		71.632 mg/kg	0.00716 %	✓		
				TPH								

#	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								
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
15	benzene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
	601-020-00-8	200-753-7	71-43-2								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %			<LOD
	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]								
19	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 }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
	006-007-00-5										
20	pH				7.3 pH		7.3 pH	7.3 pH			
			PH								
21	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				0.63 mg/kg		0.513 mg/kg	0.0000513 %	✓		
		201-469-6	83-32-9								
24	fluorene				0.47 mg/kg		0.383 mg/kg	0.0000383 %	✓		
		201-695-5	86-73-7								
25	phenanthrene				5.76 mg/kg		4.689 mg/kg	0.000469 %	✓		
		201-581-5	85-01-8								
26	anthracene				1.12 mg/kg		0.912 mg/kg	0.0000912 %	✓		
		204-371-1	120-12-7								
27	fluoranthene				9.41 mg/kg		7.66 mg/kg	0.000766 %	✓		
		205-912-4	206-44-0								
28	pyrene				8.17 mg/kg		6.65 mg/kg	0.000665 %	✓		
		204-927-3	129-00-0								
29	benzo[a]anthracene				3.56 mg/kg		2.898 mg/kg	0.00029 %	✓		
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				3.5 mg/kg		2.849 mg/kg	0.000285 %	✓		
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				3.94 mg/kg		3.207 mg/kg	0.000321 %	✓		
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				1.33 mg/kg		1.083 mg/kg	0.000108 %	✓		
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				3.5 mg/kg		2.849 mg/kg	0.000285 %	✓		
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				2.03 mg/kg		1.652 mg/kg	0.000165 %	✓		
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				0.32 mg/kg		0.26 mg/kg	0.000026 %	✓		
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				1.3 mg/kg		1.058 mg/kg	0.000106 %	✓		
		205-883-8	191-24-2								
37	polychlorobiphenyls; PCB				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	602-039-00-4	215-648-1	1336-36-3								
38	monohydric phenols				<2 mg/kg		<2 mg/kg	<0.0002 %			<LOD
			P1186								
Total:									0.099 %		

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
ND	Not detected
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 because Concentrations at less than 1.0% are "unlikely to be flammable". Flammability of soils is unlikely to result in a hazardous classification in soils (AGS Waste Classification – A Practitioner's Guide).

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00716%)

Classification of sample: WS102-0.80 - 1.10-02/03/2023

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

Sample details

Sample name:	LoW Code:	
WS102-0.80 - 1.10-02/03/2023	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)
0.80 - 1.10 m		
Moisture content:		
14.8%		
(wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 14.8% 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	• pH				7 pH		7 pH	7pH		
			PH							
Total:								0%		

Key

User supplied data
• Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS103-0.20 - 1.20-02/03/2023

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

Sample details

Sample name:	LoW Code:	
WS103-0.20 - 1.20-02/03/2023	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)
0.20 - 1.20 m		
Moisture content:		
17%		
(wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 17% 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 }				58 mg/kg	1.32	63.56 mg/kg	0.00636 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				0.8 mg/kg	1.142	0.759 mg/kg	0.0000759 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				42 mg/kg	1.462	50.95 mg/kg	0.00509 %	✓	
		215-160-9	1308-38-9							
4	copper { dicopper oxide; copper (I) oxide }				137 mg/kg	1.126	128.025 mg/kg	0.0128 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
5	mercury { mercury dichloride }				<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
6	nickel { nickel(II) oxide (nickel monoxide) }				39 mg/kg	1.273	41.194 mg/kg	0.00412 %	✓	
	028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	146 mg/kg		121.18 mg/kg	0.0121 %	✓	
	082-001-00-6									
8	selenium { selenium compounds with the exception of cadmium selenosulfide and those specified elsewhere in this Annex }				<2 mg/kg	1.405	<2.81 mg/kg	<0.000281 %		<LOD
	034-002-00-8									
9	vanadium { divanadium pentaoxide; vanadium pentoxide }				73 mg/kg	1.785	108.164 mg/kg	0.0108 %	✓	
	023-001-00-8	215-239-8	1314-62-1							
10	zinc { zinc oxide }				157 mg/kg	1.245	162.199 mg/kg	0.0162 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<2 mg/kg	1.923	<3.846 mg/kg	<0.000385 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
12	pH		PH		7.2 pH		7.2 pH	7.2 pH		
13	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-052-00-2	202-049-5	91-20-3							

#	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							
14	acenaphthylene	205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
15	acenaphthene	201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
16	fluorene	201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
17	phenanthrene	201-581-5	85-01-8		0.77 mg/kg		0.639 mg/kg	0.0000639 %	✓	
18	anthracene	204-371-1	120-12-7		0.17 mg/kg		0.141 mg/kg	0.0000141 %	✓	
19	fluoranthene	205-912-4	206-44-0		1.88 mg/kg		1.56 mg/kg	0.000156 %	✓	
20	pyrene	204-927-3	129-00-0		1.67 mg/kg		1.386 mg/kg	0.000139 %	✓	
21	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.92 mg/kg		0.764 mg/kg	0.0000764 %	✓	
22	chrysene	601-048-00-0	205-923-4	218-01-9	0.89 mg/kg		0.739 mg/kg	0.0000739 %	✓	
23	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	1.24 mg/kg		1.029 mg/kg	0.000103 %	✓	
24	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.37 mg/kg		0.307 mg/kg	0.0000307 %	✓	
25	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	1.06 mg/kg		0.88 mg/kg	0.000088 %	✓	
26	indeno[123-cd]pyrene	205-893-2	193-39-5		0.87 mg/kg		0.722 mg/kg	0.0000722 %	✓	
27	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	0.13 mg/kg		0.108 mg/kg	0.0000108 %	✓	
28	benzo[ghi]perylene	205-883-8	191-24-2		0.59 mg/kg		0.49 mg/kg	0.000049 %	✓	
Total:								0.0693 %		

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
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS103-1.70 -2.00-02/03/2023

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

Sample details

Sample name:	LoW Code:
WS103-1.70 -2.00-02/03/2023	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1.70 -2.00 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
23.3%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 23.3% 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 }				27 mg/kg	1.32	27.343 mg/kg	0.00273 %	✓	
		033-003-00-0	215-481-4	1327-53-3							
2		cadmium { cadmium oxide }				1.2 mg/kg	1.142	1.051 mg/kg	0.000105 %	✓	
		048-002-00-0	215-146-2	1306-19-0							
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				44 mg/kg	1.462	49.325 mg/kg	0.00493 %	✓	
			215-160-9	1308-38-9							
4		copper { dicopper oxide; copper (I) oxide }				93 mg/kg	1.126	80.311 mg/kg	0.00803 %	✓	
		029-002-00-X	215-270-7	1317-39-1							
5		mercury { mercury dichloride }				<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
		080-010-00-X	231-299-8	7487-94-7							
6		nickel { nickel(II) oxide (nickel monoxide) }				33 mg/kg	1.273	32.211 mg/kg	0.00322 %	✓	
		028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]							
7		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	104 mg/kg		79.768 mg/kg	0.00798 %	✓	
		082-001-00-6									
8		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<2 mg/kg	1.405	<2.81 mg/kg	<0.000281 %		<LOD
		034-002-00-8									
9		vanadium { divanadium pentaoxide; vanadium pentoxide }				41 mg/kg	1.785	56.139 mg/kg	0.00561 %	✓	
		023-001-00-8	215-239-8	1314-62-1							
10		zinc { zinc oxide }				493 mg/kg	1.245	470.665 mg/kg	0.0471 %	✓	
		030-013-00-7	215-222-5	1314-13-2							
11		chromium in chromium(VI) compounds { chromium(VI) oxide }				<2 mg/kg	1.923	<3.846 mg/kg	<0.000385 %		<LOD
		024-001-00-0	215-607-8	1333-82-0							
12		pH		PH		7.5 pH		7.5 pH	7.5 pH		
13		naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3							

#	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							
14	acenaphthylene	205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
15	acenaphthene	201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
16	fluorene	201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
17	phenanthrene	201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
18	anthracene	204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
19	fluoranthene	205-912-4	206-44-0		0.14 mg/kg		0.107 mg/kg	0.0000107 %	✓	
20	pyrene	204-927-3	129-00-0		0.13 mg/kg		0.0997 mg/kg	0.00000997 %	✓	
21	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
22	chrysene	601-048-00-0	205-923-4	218-01-9	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
23	benzo[k]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
24	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
25	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
26	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
27	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
28	benzo[ghi]perylene	205-883-8	191-24-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
Total:								0.0806 %		

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
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS104-0.00 - 0.55-02/03/2023

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

Sample details

Sample name:	LoW Code:
WS104-0.00 - 0.55-02/03/2023	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)
0.00 - 0.55 m	
Moisture content:	
12%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 12% 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 }	033-003-00-0	215-481-4	1327-53-3	24 mg/kg	1.32	27.885 mg/kg	0.00279 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0	0.6 mg/kg	1.142	0.603 mg/kg	0.0000603 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		90 mg/kg	1.462	115.755 mg/kg	0.0116 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	103 mg/kg	1.126	102.051 mg/kg	0.0102 %	✓	
5	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7	<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
6	nickel { nickel(II) oxide (nickel monoxide) }	028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]	34 mg/kg	1.273	38.076 mg/kg	0.00381 %	✓	
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			174 mg/kg		153.12 mg/kg	0.0153 %	✓	
8	selenium { selenium compounds with the exception of cadmium selenosulfide and those specified elsewhere in this Annex }	034-002-00-8			<2 mg/kg	1.405	<2.81 mg/kg	<0.000281 %		<LOD
9	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1	67 mg/kg	1.785	105.255 mg/kg	0.0105 %	✓	
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2	129 mg/kg	1.245	141.3 mg/kg	0.0141 %	✓	
11	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0	<2 mg/kg	1.923	<3.846 mg/kg	<0.000385 %		<LOD
12	pH		PH		7.4 pH		7.4 pH	7.4 pH		
13	naphthalene	601-052-00-2	202-049-5	91-20-3	0.14 mg/kg		0.123 mg/kg	0.0000123 %	✓	

#	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							
14	acenaphthylene	205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
15	acenaphthene	201-469-6	83-32-9		0.44 mg/kg		0.387 mg/kg	0.0000387 %	✓	
16	fluorene	201-695-5	86-73-7		0.25 mg/kg		0.22 mg/kg	0.000022 %	✓	
17	phenanthrene	201-581-5	85-01-8		3.43 mg/kg		3.018 mg/kg	0.000302 %	✓	
18	anthracene	204-371-1	120-12-7		0.66 mg/kg		0.581 mg/kg	0.0000581 %	✓	
19	fluoranthene	205-912-4	206-44-0		6.25 mg/kg		5.5 mg/kg	0.00055 %	✓	
20	pyrene	204-927-3	129-00-0		5.65 mg/kg		4.972 mg/kg	0.000497 %	✓	
21	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	2.79 mg/kg		2.455 mg/kg	0.000246 %	✓	
22	chrysene	601-048-00-0	205-923-4	218-01-9	2.89 mg/kg		2.543 mg/kg	0.000254 %	✓	
23	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	3.4 mg/kg		2.992 mg/kg	0.000299 %	✓	
24	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	1.24 mg/kg		1.091 mg/kg	0.000109 %	✓	
25	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	3.1 mg/kg		2.728 mg/kg	0.000273 %	✓	
26	indeno[123-cd]pyrene	205-893-2	193-39-5		2.14 mg/kg		1.883 mg/kg	0.000188 %	✓	
27	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	0.34 mg/kg		0.299 mg/kg	0.0000299 %	✓	
28	benzo[ghi]perylene	205-883-8	191-24-2		1.38 mg/kg		1.214 mg/kg	0.000121 %	✓	
Total:								0.0722 %		

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
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS104-0.80 - 1.50-02/03/2023

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

Sample details

Sample name:	LoW Code:
WS104-0.80 - 1.50-02/03/2023	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)
0.80 - 1.50 m	
Moisture content:	
33.1%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 33.1% 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 }				186 mg/kg	1.32	164.293 mg/kg	0.0164 %		✓	
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium oxide }				1.2 mg/kg	1.142	0.917 mg/kg	0.0000917 %		✓	
	048-002-00-0	215-146-2	1306-19-0								
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				36 mg/kg	1.462	35.2 mg/kg	0.00352 %		✓	
		215-160-9	1308-38-9								
4	copper { dicopper oxide; copper (I) oxide }				198 mg/kg	1.126	149.137 mg/kg	0.0149 %		✓	
	029-002-00-X	215-270-7	1317-39-1								
5	mercury { mercury dichloride }				<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
6	nickel { nickel(II) oxide (nickel monoxide) }				53 mg/kg	1.273	45.122 mg/kg	0.00451 %		✓	
	028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]								
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	141 mg/kg		94.329 mg/kg	0.00943 %		✓	
	082-001-00-6										
8	selenium { selenium compounds with the exception of cadmium selenosulfide and those specified elsewhere in this Annex }				<2 mg/kg	1.405	<2.81 mg/kg	<0.000281 %			<LOD
	034-002-00-8										
9	vanadium { divanadium pentaoxide; vanadium pentoxide }				124 mg/kg	1.785	148.092 mg/kg	0.0148 %		✓	
	023-001-00-8	215-239-8	1314-62-1								
10	zinc { zinc oxide }				92 mg/kg	1.245	76.61 mg/kg	0.00766 %		✓	
	030-013-00-7	215-222-5	1314-13-2								
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<2 mg/kg	1.923	<3.846 mg/kg	<0.000385 %			<LOD
	024-001-00-0	215-607-8	1333-82-0								
12	pH		PH		7 pH		7 pH	7pH			
13	naphthalene				0.24 mg/kg		0.161 mg/kg	0.0000161 %		✓	
	601-052-00-2	202-049-5	91-20-3								

#	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							
14	acenaphthylene	205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
15	acenaphthene	201-469-6	83-32-9		0.61 mg/kg		0.408 mg/kg	0.0000408 %	✓	
16	fluorene	201-695-5	86-73-7		0.42 mg/kg		0.281 mg/kg	0.0000281 %	✓	
17	phenanthrene	201-581-5	85-01-8		5 mg/kg		3.345 mg/kg	0.000335 %	✓	
18	anthracene	204-371-1	120-12-7		1.51 mg/kg		1.01 mg/kg	0.000101 %	✓	
19	fluoranthene	205-912-4	206-44-0		11.1 mg/kg		7.426 mg/kg	0.000743 %	✓	
20	pyrene	204-927-3	129-00-0		10.4 mg/kg		6.958 mg/kg	0.000696 %	✓	
21	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	5.25 mg/kg		3.512 mg/kg	0.000351 %	✓	
22	chrysene	601-048-00-0	205-923-4	218-01-9	4.58 mg/kg		3.064 mg/kg	0.000306 %	✓	
23	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	5.23 mg/kg		3.499 mg/kg	0.00035 %	✓	
24	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	2.02 mg/kg		1.351 mg/kg	0.000135 %	✓	
25	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	5.03 mg/kg		3.365 mg/kg	0.000337 %	✓	
26	indeno[123-cd]pyrene	205-893-2	193-39-5		2.51 mg/kg		1.679 mg/kg	0.000168 %	✓	
27	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	0.37 mg/kg		0.248 mg/kg	0.0000248 %	✓	
28	benzo[ghi]perylene	205-883-8	191-24-2		1.72 mg/kg		1.151 mg/kg	0.000115 %	✓	
Total:								0.0759 %		

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
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS104-3.00 - 4.00-02/03/2023

 **Hazardous Waste**
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:	LoW Code:
WS104-3.00 - 4.00-02/03/2023	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 03 * (Soil and stones containing hazardous substances)
3.00 - 4.00 m	
Moisture content:	
34.9%	
(wet weight correction)	

Hazard properties

HP 14: Ecotoxic "waste which presents or may present immediate or delayed risks for one or more sectors of the environment"

Hazard Statements hit:

Aquatic Chronic 1; H410 "Very toxic to aquatic life with long lasting effects."

Because of determinand:

chromium(III) oxide (worst case): (compound conc.: 0.289%)

Determinands

Moisture content: 34.9% 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 }				140 mg/kg	1.32	120.334	mg/kg	0.012 %	✓	
	033-003-00-0	215-481-4	1327-53-3								
2	 cadmium { cadmium oxide }				4.4 mg/kg	1.142	3.272	mg/kg	0.000327 %	✓	
	048-002-00-0	215-146-2	1306-19-0								
3	 chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				3040 mg/kg	1.462	2892.477	mg/kg	0.289 %	✓	
		215-160-9	1308-38-9								
4	 copper { dicopper oxide; copper (I) oxide }				756 mg/kg	1.126	554.113	mg/kg	0.0554 %	✓	
	029-002-00-X	215-270-7	1317-39-1								
5	 mercury { mercury dichloride }				<1 mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7								
6	 nickel { nickel(II) oxide (nickel monoxide) }				124 mg/kg	1.273	102.729	mg/kg	0.0103 %	✓	
	028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]								
7	 lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	656 mg/kg		427.056	mg/kg	0.0427 %	✓	
	082-001-00-6										
8	 selenium { selenium compounds with the exception of cadmium selenosulfide and those specified elsewhere in this Annex }				<2 mg/kg	1.405	<2.81	mg/kg	<0.000281 %		<LOD
	034-002-00-8										
9	 vanadium { divanadium pentaoxide; vanadium pentoxide }				380 mg/kg	1.785	441.619	mg/kg	0.0442 %	✓	
	023-001-00-8	215-239-8	1314-62-1								
10	 zinc { zinc oxide }				621 mg/kg	1.245	503.202	mg/kg	0.0503 %	✓	
	030-013-00-7	215-222-5	1314-13-2								

#	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								
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<2 mg/kg	1.923	<3.846 mg/kg	<0.000385 %			<LOD
	024-001-00-0	215-607-8	1333-82-0								
12	boron { diboron trioxide; boric oxide }				1.1 mg/kg	3.22	2.306 mg/kg	0.000231 %	✓		
	005-008-00-8	215-125-8	1303-86-2								
13	TPH (C6 to C40) petroleum group		TPH		60 mg/kg		39.06 mg/kg	0.00391 %	✓		
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
15	benzene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
	601-020-00-8	200-753-7	71-43-2								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				0.048 mg/kg		0.0312 mg/kg	0.00000312 %	✓		
	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]								
19	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 }				8 mg/kg	1.884	9.812 mg/kg	0.000981 %	✓		
	006-007-00-5										
20	pH		PH		7.2 pH		7.2 pH	7.2 pH			
21	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				0.61 mg/kg		0.397 mg/kg	0.0000397 %	✓		
		201-581-5	85-01-8								
26	anthracene				0.52 mg/kg		0.339 mg/kg	0.0000339 %	✓		
		204-371-1	120-12-7								
27	fluoranthene				0.88 mg/kg		0.573 mg/kg	0.0000573 %	✓		
		205-912-4	206-44-0								
28	pyrene				0.78 mg/kg		0.508 mg/kg	0.0000508 %	✓		
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.35 mg/kg		0.228 mg/kg	0.0000228 %	✓		
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.35 mg/kg		0.228 mg/kg	0.0000228 %	✓		
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.37 mg/kg		0.241 mg/kg	0.0000241 %	✓		
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.28 mg/kg		0.182 mg/kg	0.0000182 %	✓		
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-883-8	191-24-2								

#	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							
37	chloromethane; methyl chloride				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-001-00-7	200-817-4	74-87-3							
38	vinyl chloride; chloroethylene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-023-00-7	200-831-0	75-01-4							
39	bromomethane; methylbromide				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-002-00-2	200-813-2	74-83-9							
40	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3							
41	tetrachloroethylene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-028-00-4	204-825-9	127-18-4							
42	carbon tetrachloride; tetrachloromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-008-00-5	200-262-8	56-23-5							
43	trichloroethylene; trichloroethene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-027-00-9	201-167-4	79-01-6							
44	hexachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-065-00-6	204-273-9	118-74-1							
45	phenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
46	bromoform; tribromomethane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-007-00-X	200-854-6	75-25-2							
47	dibromomethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-003-00-8	200-824-2	74-95-3							
48	asbestos				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
	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							
49	dichlorodifluoromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		200-893-9	75-71-8							
50	chloroethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-009-00-0	200-830-5	75-00-3							
51	trichlorofluoromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		200-892-3	75-69-4							
52	1,1-dichloroethylene; vinylidene chloride				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-025-00-8	200-864-0	75-35-4							
53	2,2-dichloropropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		209-832-0	594-20-7							
54	chloroform; trichloromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-006-00-4	200-663-8	67-66-3							
55	bromochloromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		200-826-3	74-97-5							
56	1,1,1-trichloroethane; methyl chloroform				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-013-00-2	200-756-3	71-55-6							
57	1,1-dichloropropene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-031-00-0	209-253-3	563-58-6							
58	1,2-dichloropropane; propylene dichloride				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-020-00-0	201-152-2	78-87-5							
59	bromodichloromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		200-856-7	75-27-4							
60	2-methoxy-2-methylbutane; tert-amyl methyl ether				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	603-213-00-2	213-611-4	994-05-8							
61	1,3-dichloropropene; [1] (Z)-1,3-dichloropropene [2]				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-030-00-5	208-826-5 [1] 233-195-8 [2]	542-75-6 [1] 10061-01-5 [2]							
62	trans-1,3-dichloropropene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		431-460-4	10061-02-6							

#	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							
63	1,1,2-trichloroethane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-014-00-8	201-166-9	79-00-5							
64	1,3-dichloropropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		205-531-3	142-28-9							
65	dibromochloromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		204-704-0	124-48-1							
66	1,2-dibromoethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-010-00-6	203-444-5	106-93-4							
67	chlorobenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-033-00-1	203-628-5	108-90-7							
68	1,1,1,2-tetrachloroethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		211-135-1	630-20-6							
69	styrene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-026-00-0	202-851-5	100-42-5							
70	1,1,2,2-tetrachloroethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-015-00-3	201-197-8	79-34-5							
71	1,2,3-trichloropropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-062-00-X	202-486-1	96-18-4							
72	bromobenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-060-00-9	203-623-8	108-86-1							
73	mesitylene; 1,3,5-trimethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-025-00-5	203-604-4	108-67-8							
74	tert-butylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		202-632-4	98-06-6							
75	1,2,4-trimethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-043-00-3	202-436-9	95-63-6							
76	sec-butylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		205-227-0	135-98-8							
77	4-isopropyltoluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		202-796-7	99-87-6							
78	1,3-dichlorobenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-067-00-7	208-792-1	541-73-1							
79	1,4-dichlorobenzene; p-dichlorobenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-035-00-2	203-400-5	106-46-7							
80	n-butylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		203-209-7	104-51-8							
81	1,2-dichlorobenzene; o-dichlorobenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	602-034-00-7	202-425-9	95-50-1							
82	1,2-dibromo-3-chloropropane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-021-00-6	202-479-3	96-12-8							
83	hexachlorobutadiene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
		201-765-5	87-68-3							
84	1,2,4-trichlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-087-00-6	204-428-0	120-82-1							
85	2-nitrophenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-857-5	98-75-5							
86	nitrobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	609-003-00-7	202-716-0	98-95-3							
87	bis(2-chloroethoxy)methane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		203-920-2	111-91-1							
88	bis(2-chloroethyl) ether				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	603-029-00-2	203-870-1	111-44-4							
89	2,4-dichlorophenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	604-011-00-7	204-429-6	120-83-2							
90	2-chlorophenol; [1] 4-chlorophenol; [2] 3-chlorophenol; [3] chlorophenol [4]				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	604-008-00-0	202-433-2 [1] 203-402-6 [2] 203-582-6 [3] 246-691-4 [4]	95-57-8 [1] 106-48-9 [2] 108-43-0 [3] 25167-80-0 [4]							

#	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								
91	3,4-xyleneol; [1] 2,5-xyleneol; [2] 2,4-xyleneol; [3] 2,3-xyleneol; [4] 2,6-xyleneol; [5] xyleneol; [6] 2,4(or 2,5)-xyleneol [7] 604-006-00-X	202-439-5 [1] 202-461-5 [2] 203-321-6 [3] 208-395-3 [4] 209-400-1 [5] 215-089-3 [6] 276-245-4 [7]	95-65-8 [1] 95-87-4 [2] 105-67-9 [3] 526-75-0 [4] 576-26-1 [5] 1300-71-6 [6] 71975-58-1 [7]		<0.15 mg/kg		<0.15 mg/kg	<0.000015 %			<LOD
92	3,5,5-trimethylcyclohex-2-enone; isophorone 606-012-00-8	201-126-0	78-59-1		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
93	hexachloroethane 200-666-4	67-72-1			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
94	2,4,6-trichlorophenol 604-018-00-5	201-795-9	88-06-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
95	2,4,5-trichlorophenol 604-017-00-X	202-467-8	95-95-4		<0.15 mg/kg		<0.15 mg/kg	<0.000015 %			<LOD
96	chlorocresol; 4-chloro-m-cresol; 4-chloro-3-methylphenol 604-014-00-3	200-431-6	59-50-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
97	2-methyl naphthalene 202-078-3	91-57-6			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
98	hexachlorocyclopentadiene 602-078-00-7	201-029-3	77-47-4		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
99	2,6-dinitrotoluene 609-049-00-8	210-106-0	606-20-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
100	dimethyl phthalate 205-011-6	131-11-3			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
101	2-chloronaphthalene 202-079-9	91-58-7			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
102	4-chloroaniline 612-137-00-9	203-401-0	106-47-8		<0.15 mg/kg		<0.15 mg/kg	<0.000015 %			<LOD
103	4-nitrophenol; p-nitrophenol 609-015-00-2	202-811-7	100-02-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
104	4-chlorophenylphenylether 230-281-7	7005-72-3			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
105	4-bromophenylphenylether 202-952-4	101-55-3			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
106	2,4-dinitrotoluene; [1] dinitrotoluene [2] 609-007-00-9	204-450-0 [1] 246-836-1 [2]	121-14-2 [1] 25321-14-6 [2]		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
107	diethyl phthalate 201-550-6	84-66-2			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
108	dibenzofuran 205-071-3	132-64-9			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
109	azobenzene 611-001-00-6	203-102-5	103-33-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
110	dibutyl phthalate; DBP 607-318-00-4	201-557-4	84-74-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
111	carbazole 201-696-0	86-74-8			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
112	bis(2-ethylhexyl) phthalate; di-(2-ethylhexyl) phthalate; DEHP 607-317-00-9	204-211-0	117-81-7		<0.15 mg/kg		<0.15 mg/kg	<0.000015 %			<LOD
113	BBP; benzyl butyl phthalate 607-430-00-3	201-622-7	85-68-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
114	di-n-octyl phthalate 204-214-7	117-84-0			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
115	monohydric phenols P1186				<2 mg/kg		<2 mg/kg	<0.0002 %			<LOD

#		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									
116		m-cresol; [1] o-cresol; [2] p-cresol; [3] mix-cresol [4]				<0.25	mg/kg	<0.25	mg/kg	<0.000025 %		<LOD	
	604-004-00-9	203-577-9 [1]	108-39-4 [1]										
		202-423-8 [2]	95-48-7 [2]										
		203-398-6 [3]	106-44-5 [3]										
		215-293-2 [4]	1319-77-3 [4]										
117		1,2-dichloroethylene; [1] cis-dichloroethylene; [2] trans-dichloroethylene [3]				<0.01	mg/kg	<0.01	mg/kg	<0.000001 %		<LOD	
	602-026-00-3	208-750-2 [1]	540-59-0 [1]										
		205-859-7 [2]	156-59-2 [2]										
		205-860-2 [3]	156-60-5 [3]										
118		cumene; [1] propylbenzene [2]				<0.01	mg/kg	<0.01	mg/kg	<0.000001 %		<LOD	
	601-024-00-X	202-704-5 [1]	98-82-8 [1]										
		203-132-9 [2]	103-65-1 [2]										
119		2-chlorotoluene; [1] 3-chlorotoluene; [2] 4-chlorotoluene; [3] chlorotoluene [4]				<0.01	mg/kg	<0.01	mg/kg	<0.000001 %		<LOD	
	602-040-00-X	202-424-3 [1]	95-49-8 [1]										
		203-580-5 [2]	108-41-8 [2]										
		203-397-0 [3]	106-43-4 [3]										
		246-698-2 [4]	25168-05-2 [4]										
120		o-nitroaniline; [1] m-nitroaniline; [2] p-nitroaniline [3]				<0.3	mg/kg	<0.3	mg/kg	<0.00003 %		<LOD	
	612-012-00-9	201-855-4 [1]	88-74-4 [1]										
		202-729-1 [2]	99-09-2 [2]										
		202-810-1 [3]	100-01-6 [3]										
Total:											0.512 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	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
ND	Not detected
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 because Concentrations at less than 1.0% are "unlikely to be flammable". Flammability of soils is unlikely to result in a hazardous classification in soils (AGS Waste Classification – A Practitioner's Guide).

Hazard Statements hit:

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

Because of determinands:

TPH (C6 to C40) petroleum group: (conc.: 0.00391%)
xylene: (conc.: 3.12e-06%)

Classification of sample: WS105-3.00 - 4.00-02/03/2023

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

Sample details

Sample name:	LoW Code:
WS105-3.00 - 4.00-02/03/2023	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)
3.00 - 4.00 m	
Moisture content:	
19.8%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 19.8% 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 }			47	mg/kg	1.32	49.768	mg/kg	0.00498 %	✓	
		033-003-00-0	215-481-4	1327-53-3								
2		cadmium { cadmium oxide }			0.8	mg/kg	1.142	0.733	mg/kg	0.0000733 %	✓	
		048-002-00-0	215-146-2	1306-19-0								
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }			259	mg/kg	1.462	303.591	mg/kg	0.0304 %	✓	
			215-160-9	1308-38-9								
4		copper { dicopper oxide; copper (I) oxide }			77	mg/kg	1.126	69.528	mg/kg	0.00695 %	✓	
		029-002-00-X	215-270-7	1317-39-1								
5		mercury { mercury dichloride }			<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD
		080-010-00-X	231-299-8	7487-94-7								
6		nickel { nickel(II) oxide (nickel monoxide) }			32	mg/kg	1.273	32.66	mg/kg	0.00327 %	✓	
		028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]								
7		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	453	mg/kg	363.306	mg/kg	0.0363 %	✓	
		082-001-00-6										
8		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }			<2	mg/kg	1.405	<2.81	mg/kg	<0.000281 %		<LOD
		034-002-00-8										
9		vanadium { divanadium pentaoxide; vanadium pentoxide }			48	mg/kg	1.785	68.722	mg/kg	0.00687 %	✓	
		023-001-00-8	215-239-8	1314-62-1								
10		zinc { zinc oxide }			151	mg/kg	1.245	150.737	mg/kg	0.0151 %	✓	
		030-013-00-7	215-222-5	1314-13-2								
11		chromium in chromium(VI) compounds { chromium(VI) oxide }			<2	mg/kg	1.923	<3.846	mg/kg	<0.000385 %		<LOD
		024-001-00-0	215-607-8	1333-82-0								
12		pH			7.8	pH		7.8	pH	7.8 pH		
				PH								
13		naphthalene			<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3								

#	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							
14	acenaphthylene	205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
15	acenaphthene	201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
16	fluorene	201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
17	phenanthrene	201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
18	anthracene	204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
19	fluoranthene	205-912-4	206-44-0		0.15 mg/kg		0.12 mg/kg	0.000012 %	✓	
20	pyrene	204-927-3	129-00-0		0.12 mg/kg		0.0962 mg/kg	0.00000962 %	✓	
21	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
22	chrysene	601-048-00-0	205-923-4	218-01-9	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
23	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
24	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
25	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
26	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
27	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
28	benzo[ghi]perylene	205-883-8	191-24-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
29	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:								0.106 %		

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
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS105-4.20 - 5.00-02/03/2023



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

Sample details

Sample name:	LoW Code:	
WS105-4.20 - 5.00-02/03/2023	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)
4.20 - 5.00 m		
Moisture content:		
18.5%		
(wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 18.5% 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	pH PH				7.1 pH		7.1 pH	7.1 pH		
Total:								0%		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

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

• lead compounds with the exception of those specified elsewhere in this Annex

GB MCL index number: 082-001-00-6

Description/Comments: Least-worst case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following MCL protocols, considers many simple lead compounds to be Carcinogenic category 2

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 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html. Review date 29/09/2015

• divanadium pentaoxide; vanadium pentoxide (EC Number: 215-239-8, CAS Number: 1314-62-1)

GB MCL index number: 023-001-00-8

Description/Comments:

Additional Hazard Statement(s): Carc. 1B; H350 , Acute Tox. 3; H301 , Acute Tox. 2; H330

Reason for additional Hazards Statement(s):

20 Sep 2022 - Carc. 1B; H350 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be Carc. 1B; H350. The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List].

Substance has therefore been self-classified.

28 Sep 2022 - Acute Tox. 3; H301 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be "Acute tox 3; H301". The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List].

Substance has therefore been self-classified.

28 Sep 2022 - Acute Tox. 2; H330 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be "Acute tox 2; H330". The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List].

Substance has therefore been self-classified.

• pH (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

• 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

• 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

• 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

• 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

■ **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

■ **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

■ **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

■ **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

■ **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

■ **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

■ **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

■ **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

■ **1,1-dichloroethane and 1,2-dichloroethane (combined)** (EC Number: 203-458-1, 200-863-5, CAS Number: 107-06-2, 75-34-3)

Description/Comments: Combines the hazard statements and risk phrases for 1,1-dichloroethane and 1,2-dichloroethane
Data source: N/a
Data source date: 14 Oct 2016
Hazard Statements: Flam. Liq. 2; H225, Acute Tox. 4; H302, Skin Irrit. 2; H315, Eye Irrit. 2; H319, STOT SE 3; H335, Carc. 1B; H350, Aquatic Chronic 3; H412

■ **dichlorodifluoromethane** (EC Number: 200-893-9, CAS Number: 75-71-8)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Aquatic Chronic 3; H412, Ozone 1; H420, Press. Gas; H280

▀ **trichlorofluoromethane** (EC Number: 200-892-3, CAS Number: 75-69-4)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H312 , Ozone 1; H420

▀ **2,2-dichloropropane** (EC Number: 209-832-0, CAS Number: 594-20-7)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H332 , Flam. Liq. 2; H225 , Acute Tox. 4; H302 , Acute Tox. 4; H312 , Eye Irrit. 2; H319

▀ **bromochloromethane** (EC Number: 200-826-3, CAS Number: 74-97-5)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H312 , Skin Corr. 1B; H314 , Eye Dam. 1; H318 , Acute Tox. 4; H332 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Ozone 1; H420

▀ **bromodichloromethane** (EC Number: 200-856-7, CAS Number: 75-27-4)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 2B;
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Dam. 1; H318 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 1A; H360

▀ **trans-1,3-dichloropropene** (EC Number: 431-460-4, CAS Number: 10061-02-6)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Flam. Liq. 3; H226 , Acute Tox. 3; H301 , Asp. Tox. 1; H304 , Acute Tox. 3; H311 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Eye Irrit. 2; H319 , Acute Tox. 4; H332 , STOT SE 3; H335 , Aquatic Chronic 1; H410

▀ **1,3-dichloropropane** (EC Number: 205-531-3, CAS Number: 142-28-9)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H332 , Flam. Liq. 2; H225 , Flam. Liq. 3; H226 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335

▀ **dibromochloromethane** (EC Number: 204-704-0, CAS Number: 124-48-1)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 3;
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 4; H312 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Acute Tox. 4; H332 , STOT SE 3; H335 , STOT SE 3; H336 , Muta. 2; H341 , Aquatic Chronic 2; H411

▀ **1,1,1,2-tetrachloroethane** (EC Number: 211-135-1, CAS Number: 630-20-6)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 2B;
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , Acute Tox. 3; H331 , Eye Dam. 1; H318 , Acute Tox. 4; H332 , Carc. 2; H351 , Acute Tox. 4; H312 , Aquatic Chronic 3; H412 , Skin Irrit. 2; H315

▀ **tert-butylbenzene** (EC Number: 202-632-4, CAS Number: 98-06-6)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Flam. Liq. 3; H226 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Acute Tox. 3; H331 , Acute Tox. 4; H332 , STOT SE 3; H335 , Asp. Tox. 1; H304 , Aquatic Chronic 2; H411

▀ **sec-butylbenzene** (EC Number: 205-227-0, CAS Number: 135-98-8)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Aquatic Chronic 2; H411

• **4-isopropyltoluene** (EC Number: 202-796-7, CAS Number: 99-87-6)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Chronic 2; H411

• **n-butylbenzene** (EC Number: 203-209-7, CAS Number: 104-51-8)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Flam. Liq. 3; H226 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **hexachlorobutadiene** (EC Number: 201-765-5, CAS Number: 87-68-3)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 3;

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 3; H301 , Acute Tox. 2; H310 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Eye Irrit. 2; H319 , Acute Tox. 2; H330 , Carc. 2; H351 , Repr. 2; H361 , STOT SE 2; H371 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **2-nitrophenol** (EC Number: 201-857-5, CAS Number: 88-75-5)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 4; H312 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Acute Tox. 4; H332 , STOT SE 3; H335 , STOT RE 2; H373 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **bis(2-chloroethoxy)methane** (EC Number: 203-920-2, CAS Number: 111-91-1)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 3; H301 , Acute Tox. 4; H312 , Acute Tox. 1; H330 , Acute Tox. 2; H330 , STOT SE 1; H370 , STOT RE 2; H373

• **hexachloroethane** (EC Number: 200-666-4, CAS Number: 67-72-1)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 2B;

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

Data source date: 02 Mar 2017

Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , STOT RE 2; H373

• **2-methyl naphthalene** (EC Number: 202-078-3, CAS Number: 91-57-6)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , STOT SE 3; H336 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **dimethyl phthalate** (EC Number: 205-011-6, CAS Number: 131-11-3)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Acute Tox. 3; H331 , STOT SE 3; H335 , STOT SE 3; H336 , Repr. 2; H361 , Aquatic Chronic 3; H412

• **2-chloronaphthalene** (EC Number: 202-079-9, CAS Number: 91-58-7)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

• **4-chlorophenylphenylether** (EC Number: 230-281-7, CAS Number: 7005-72-3)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Eye Dam. 1; H318 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **4-bromophenylphenylether** (EC Number: 202-952-4, CAS Number: 101-55-3)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Eye Dam. 1; H318 , Eye Irrit. 2; H319 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **diethyl phthalate** (EC Number: 201-550-6, CAS Number: 84-66-2)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Skin Irrit. 2; H315 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , STOT SE 3; H335 , STOT RE 2; H373 , Repr. 2; H361 , Acute Tox. 4; H302 , STOT SE 3; H336 , Skin Sens. 1; H317 , Aquatic Chronic 1; H410

• **dibenzofuran** (EC Number: 205-071-3, CAS Number: 132-64-9)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 4; H312 , Acute Tox. 4; H332 , Aquatic Chronic 2; H411

• **carbazole** (EC Number: 201-696-0, CAS Number: 86-74-8)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 2B;

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Muta. 2; H341 , Carc. 2; H351 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301

• **di-n-octyl phthalate** (EC Number: 204-214-7, CAS Number: 117-84-0)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Repr. 2; H361 , Skin Sens. 1; H317 , Resp. Sens. 1; H334 , Eye Irrit. 2; H319 , Aquatic Chronic 4; H413

• **monohydric phenols** (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)

Data source: CLP combined data

Data source date: 26 Mar 2019

Hazard Statements: Muta. 2; H341 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301 , STOT RE 2; H373 , Skin Corr. 1B; H314 , Skin Corr. 1B; H314 >= 3 % , Skin Irrit. 2; H315 1 £ conc. < 3 % , Eye Irrit. 2; H319 1 £ conc. < 3 % , Aquatic Chronic 2; H411

• **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

GB MCL index number: 602-039-00-4

Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans;

POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.

Additional Hazard Statement(s): Carc. 1A; H350

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

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

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.

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

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. Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected.

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight

nickel {nickel(II) oxide (nickel monoxide)}

Worst case compound based on absence of CrVI and assumed metal oxides from a combustion, ash based source.

lead {lead compounds with the exception of those specified elsewhere in this Annex}

Worst case compound based on absence of CrVI and assumed metal oxides from a combustion, ash based source.

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.

vanadium {divanadium pentaoxide; vanadium pentoxide}

Most conservative species.

zinc {zinc oxide}

Worst case compound based on absence of CrVI and assumed metal oxides from a combustion, ash based source.

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

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass.

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]

Appendix C: Version

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

HazWasteOnline Classification Engine Version: 2023.73.5544.10256 (14 Mar 2023)

HazWasteOnline Database: 2023.73.5544.10256 (14 Mar 2023)

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

Appendix L

Environmental Cover System Construction

Private Gardens

Shared Landscaping

PRIVATE BACK GARDENS:

Physical break layer

GROUND LEVEL

↑ 0.6m (min) ↓		150mm (minimum) chemically validated TOPSOIL
		350mm chemically validated SUBSOIL
		100mm (minimum) PHYSICAL BREAK LAYER
		Existing MADE GROUND

PRIVATE FRONT GARDENS / SHARED LANDSCAPING:

Physical break layer

GROUND LEVEL

↑ 0.3m (min) ↓		150mm (minimum) chemically validated TOPSOIL
		50mm chemically validated SUBSOIL
		100mm (minimum) PHYSICAL BREAK LAYER
		Existing MADE GROUND

Hardstood Areas – No Remediation Required