

ROCHDALE ROAD MANCHESTER

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

Job Number: LKC 20 1328

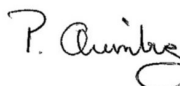
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1 Introduction

1.1 Background

LK Consult Ltd (LKC) has been commissioned by Premcor Estates Ltd to carry out a Phase 2 Geo-Environmental Investigation, Risk Assessment and Remediation Strategy for land at Rochdale Road, Manchester. The investigation was undertaken in support of a future planning application to redevelop the site for a nine storey hotel building.

The following work has previously been undertaken:

- » Preliminary Risk Assessment (PRA) report, undertaken by LKC (Ref: LKC 20 1328, dated May 2020).

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.

1.2 Site Details

A summary of the site details is presented in Table 1-1. Figures 1 and 2 indicate the site location and boundary. Figure 3 indicates the proposed development.

Location	End of Rochdale Road, to the south of Dyche Street, Manchester. Centred at approximate National Grid Reference 384540E, 398990N.
Area	0.13 Ha.
Topography	52 metres above ordnance datum (AOD). Site is approximately level.
Current Land Use	<u>Site</u> Hardstanding ground across the entire site. Currently used as a public car park with a single storey office building present. <u>Surrounding Area</u> North: Residential apartments. East: Ludgate Street and The Angel Pub with associated garden. South: Rochdale Road and residential apartments. West: Particular Baptist Church.
Proposed Development	Nine storey hotel building.

Table 1-1. Summary of site details.

2 Previous Work

2.1 Summary of Existing Information

A Phase 1 PRA report (Ref: LKC 20 1328, dated May 2020) has previously been undertaken by LKC and this report should be read in conjunction with the Phase 1 PRA.

2.2 LKC Preliminary Contamination Conceptual Model

The preliminary contamination conceptual model using contaminant-pathway-receptor linkages based on guidance in CLR11¹ has been summarised in Table 2-1.

The aim of the conceptual model is to provide a preliminary assessment of the likelihood of a pollutant linkage for each potential combination of contaminant, pathway and receptor. A conceptual model can be used to make an informed decision on the contamination risks associated with the site and determine what site investigation work is required.

The preliminary contamination conceptual model has identified seven generic potential pollutant linkages. Each linkage is described along with an assessment of the risk based upon guidance on probabilities and consequences outlined in CIRIA C552².

In order to assess the potential risk for each pollutant linkage, an assessment of the magnitude of the potential consequence (severity) of the risk occurring and the magnitude of the probability (likelihood) of the risk occurring has been considered and classified. This is based on the guidance provided in CIRIA C552 and further details including a risk matrix is provided in Appendix A.

Where LKC identified a low to very low risk, limited intrusive investigation work, a watching brief (during construction work) or no investigation work will be recommended. This will be dependent on the nature of the site and the proposed development.

Where the risk falls into the moderate/low risk, LKC will undertake an assessment to establish what category the pollutant linkage will fall into (i.e. moderate or low risk will be chosen).

Where LKC identifies a moderate or higher risk, intrusive work or precautionary remedial measures will be recommended.

It should be noted that there may be risk from short term exposure from contaminated soil to site workers during development work. The Preliminary Contamination Conceptual Model deals with long term exposure to key receptors associated with the future use of the site. Acute risks can be easily mitigated by good environmental management of the site during site works. Standard health and safety precautions (as per HSE guidance³) should be adopted by all workers involved with site enabling and construction works. Therefore, this receptor is not considered in the contamination conceptual model.

¹ EA (2004). "Model Procedures for the Management of Land Contamination." R&D Publication CLR 11.

² CIRIA (2001). "Contaminated land risk assessment: A guide to good practice". C552.

³ HSE (1991). "Protection of Workers and the General Public During Development of Contaminated Land" London HMSO.

2.3 Recommendations

Based upon the Preliminary Contamination Conceptual Model, a site investigation was recommended to assess the potential pollutant linkages further.

Pollutant Linkage	Pathway	Receptor	Contaminant (source)	Probability	Consequence	Risk	Assessment and Recommendations
PL1	-Dermal contact. -Inhalation of soil, fibres and dust. -Ingestion of soils, dust, vegetables, soil attached to vegetables. -Windblown dust.	-Future site users. -Offsite receptors.	-Heavy Metals. -ACM. -PAHs. -Hydrocarbons. -Other inorganic and organic contaminants. -(made ground, former filling station on site, car park)	Likely	Medium	Moderate	-Likely probability given history of site and potential pathway to receptors in soft landscaping. -Recommendation: Intrusive investigation required.
PL2	-Inhalation of vapours. -Migration through permeable strata and preferential pathways.	-Future site users. -Offsite receptors.	-Volatile Contaminants such as hydrocarbons, solvents, antifreeze (made ground, former filling station, and car park on site).	Likely	Medium	Moderate	-Likely probability due to potential source of volatile contamination from identified former filling station onsite. -Recommendation: Testing required.
PL3	-Inhalation of gas. -Migration through permeable strata and preferential pathways. -Explosion in confined spaces.	-Future site users. -Buildings. -Offsite land users.	-Methane, carbon dioxide. (potentially infilled features 250m of the site).	Unlikely	Severe	Moderate / Low	-Unlikely probability as no significant viable source of gas identified within 250m of the site. -Low risk assumed at this stage. -Recommendation: No further assessment required unless significant thickness of made ground identified.
			-Volatile hydrocarbon odours (former onsite filling station).	Low	Severe	Moderate	-Low probability due to age of petrol filling station and likely decommissioned USTs. -Recommendation: Vapour monitoring if evidence of hydrocarbons present.
PL4	-Surface Run-off. -Migration through permeable strata and preferential pathways -Perched waters migration.	-Groundwater (Principal Aquifer).	-Mobile contaminants such as metals, PAHs, hydrocarbons, volatile compounds (made ground, former filling station, and car park on site).	Likely	Medium	Moderate	-Likely probability as large scale spillages of mobile contamination anticipated from identified onsite sources -Recommendation: Testing required.
PL5	-Sulphate attack on concrete.	-Building structure.	-Sulphate (ash potentially in made ground).	Likely	Mild	Moderate / Low	-Likely probability as ash containing made ground may be present on site which may be in contact with concrete in foundations. -Moderate risk assumed at this stage due to unknown depth of made ground. -Recommendation: Testing required.
PL6	-Ingestion of tainted water supply.	-Future site users. -Water pipes.	-Organic Contaminants such as hydrocarbons, solvents (made ground, former filling station, and car park on site).	Likely	Medium	Moderate	-Likely probability as contamination at pipeline depth (0.75-1.35m) is unknown. -Risk is considered moderate at this stage due to unknown depth of made ground. -Recommendation: Sampling required if made ground present at pipeline installation depths.
PL7	-Direct Contact (plant uptake).	-Flora.	-Phytotoxic Contaminants (made ground).	Likely	Minor	Low	-Low probability as contamination considered possible, which may be taken up by flora in soft landscaping / gardens. -Recommendation: Investigation work as part of PL1.

Table 2-1. 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 6th to 23rd April 2020 and comprised the following:

- 3no. window sample boreholes drilled to 3.34-5.45 metres below ground level (mbgl) (ref. WS101 to WS103).
- 3no. cable percussion with rotary follow on boreholes drilled to 24.0-28.5mbgl (ref. CP101 to CP103).
- 9no. trial pits (using JCB / 10t tracked machine) excavated to 0.25-2.50mbgl (ref. TP201a to TP207).
- 3no. hand pits (using hand auger / spade) excavated to 1.1-1.3mbgl (ref. TP105 to TP107).

Due to deep made ground identified in the window sample boreholes (to 5-6mbgl), cable percussion boreholes were carried out to allow an assessment of the deeper ground conditions for contamination / geotechnical purposes.

Hand augers were undertaken in areas where access was restricted to drilling rigs and plant (TP105-TP107)

TP201A had to be re-positioned due to an obstruction. The repositioned borehole is referenced TP201B. TP205A was excavated on 16th April 2020 and extended to find an underground tank on 23rd April 2020 and referenced as TP205B.

All site investigation locations are shown in Figure 4.

The locations were chosen to allow a good spread 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
WS101-103, CP101-103	General site coverage.
TP105-107	Foundations for retaining wall on the border of site.
TP201A-TP203, TP207	Foundations and basement of former building on site.
TP204-206	Potential underground storage tanks.

Table 3-1: Summary of sampling locations.

The number of site investigation points corresponds to approximately one location per 18m square centres. This is considered to be a conservative sampling density and is in line with BS10175⁴ for a 'main investigation'.

All profile logs are provided in Appendix B and are in line with BS14688-1⁵ and BS5930⁶.

⁴ British Standard (2017). "Investigation of Potentially Contaminated Sites – Code of Practice." BS10175:2017.

⁵ British Standards (2002) Geotechnical investigation and testing – Identification and Classification of Soil. Part 1: Identification and description. BS EN ISO 14688-1:2002.

⁶ British Standard (2015). "Code of Practice for Ground Investigations". BS5930:2015.

3.2 Well Installations

All of the boreholes (WS101-WS103, CP101-103) were installed with monitoring wells for groundwater monitoring and sampling.

All wells were installed in accordance with BS10175 and CIRIA C665⁷. The shallow monitoring wells in the window sample boreholes generally comprised approximately 1m plain pipe over a length of slotted pipe surrounded by pea gravel and sealed at the top with bentonite and concrete.

The deeper wells installed in the cable percussive boreholes targeted the underlying natural strata with the slotted section screened off from the overlying made ground.

Well installation details are provided in profile logs in Appendix B.

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 investigation⁸.

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 B). The on-site monitoring was carried out in line CIRIA C665 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 Chemtest 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 C. Table 3-2 shows the soil testing undertaken.

⁷ CIRIA (2007). "Assessing Risks Posed by Hazardous Ground Gases to Buildings." CIRIA C665.

⁸ EA (2000). "Technical Aspects of Site Investigation. Volumes 1 & 2 Text Supplements Research and Development Technical Report." P5-065/Tr.

Suites and Contaminants	No. Samples	Location & Depth	Justification
Metals / metalloids, pH, water soluble sulphate, speciated PAHs, SOM and asbestos screen.	11	TP105 0.3-0.6m TP106 0.2-0.5m TP107 0.0-0.5m TP201 0.1-1m TP202 0.3-1m TP203 0.3-0.9m TP205 0.2-0.5m TP206 0.25-1.0m TP207 0.2-0.5m WS101 0.2-0.5m WS102 0.2-0.6m	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 occasional ash and coal) 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.	2	TP204 0.55-0.6m WS103 0.1-0.5m	Evidence of hydrocarbon contamination (visual / olfactory) identified in TP204 0.55-0.6m and WS103 0.11-0.5m therefore detailed suite undertaken to confirm contamination risk and extent.
TPHCWG, BTEX, MTBE and SOM.	3	TP204 1.0-2.0m TP205B 0.85-1.4m TP206 1.5-2.2m	TP204 1.0-2.0m tested to confirm the extent of hydrocarbon contamination observed in shallower strata. TP205B and TP206 tested to prove the absence of hydrocarbon contamination in proximity to the below ground tanks.

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, SOM=Soil Organic Matter.

3.3.2 Water Sampling

To establish the condition of groundwater below the site LKC proposed to undertake groundwater sampling. However, no groundwater was encountered in the boreholes. Leachate tests were considered as an alternative but, as the main contaminants of concern were hydrocarbons and the leachate test was developed for inorganic constituents, this would not provide a suitable representation of the risk to the underlying aquifer.

3.4 Gas Monitoring

Gas monitoring was not carried out as part of this investigation.

A moderate/low risk was identified in the preliminary contamination conceptual model for gas (pollutant linkage 3) and further action was only recommended if significant organic / putrescible material or a significant thickness of made ground was identified on site. Based on the ground conditions encountered, LKC did not consider gas monitoring to be required. This is discussed further in Section 6.3.

3.5 Geotechnical Testing

3.5.1 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 and cable percussion boreholes at approximately 1m intervals, generally within the natural strata.
- » Shear Vane tests (giving undrained shear strength) were performed in the window sample boreholes (to a maximum depth of 3mbgl) and trial pits at approximately 1m intervals, within the natural clay strata.

The SPT and shear vane readings are provided within the profile logs (Appendix B).

3.5.2 Laboratory Geotechnical Testing

Soil samples taken during the investigation were collected in tubs, bulk bags and sealed U100 tubes and sent to Murray Rix Laboratories for geotechnical testing.

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

Suites and Contaminants	No. Samples	Justification
pH and water-soluble sulphate	2	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 contamination suites.
Atterberg Limits (plasticity testing)	3	A selection of shallow clay samples across the site were tested for Atterberg Limits to assess their shrinkability potential.
Single Stage Triaxial	8	Undertaken on U100 samples of the natural ground to confirm the strength of the clay strata.
Particle Size Distribution (PSD)	5	PSD undertaken to confirm grading of granular material.
Unconfined Compression Test	5	To determine rock strength characteristics for pile design.
Point Load Tests	30	To determine rock strength characteristics for pile design.

Table 3-3. Summary of geotechnical testing undertaken.

4 Ground Conditions

4.1 Geology – Generalised Sequence

The ground conditions beneath the site comprised made ground underlain by natural sandy gravelly clay. A summary is provided in Table 4-1.

Strata	Typical Description	Min Depth to top of Strata (mbgl)	Max Depth to top of Strata (mbgl)	Thickness (m)
Made Ground	Hardstanding of concrete or tarmacadam over variably sandy gravelly silt containing brick, concrete, ash and clinker with rare timber, plastic and metal (demolition rubble).	0.00	0.00	1.50-3.50
Cohesive	Very stiff brown variably sandy gravelly CLAY (Glacial Till).	1.50	3.50	12.00-13.50
Granular	Dense to very dense red brown SAND and GRAVEL (weathered Chester Formation).	15.00	15.50	8.00-13.00
Bedrock	Interbedded SANDSTONE and MUDSTONE (Chester Formation).	27.50	28.00	Not proven

Table 4-1: Summary of ground conditions.

4.2 Below Ground Structures

A number of below ground structures were encountered during the intrusive investigation including the two former below ground tanks. Cross sections of the structures encountered including measurements made are presented in Appendix B.

4.3 Groundwater

4.3.1 Groundwater Levels

No groundwater was present in the trial pits. Results of the groundwater depths within the boreholes are summarised in Table 4-2.

BH/TP	Water Strike Depths (mbgl)	Well Response Zone (mbgl)	No. of Monitoring Visits	Monitoring Depths (mbgl)		
				Min	Max	Base
WS101	2.4	0.6-2.6 (MG/C)	2	2.49	Dry	2.52
WS102	2.5	1.0-4.0 (MG/C)	2	3.31	Dry	3.80
WS103	Dry	0.5-2.5 (MG/C)	2	Dry	Dry	2.31
CP101	Dry*	8-16 (C/S)	2	Dry	Dry	15.5
CP102	Dry*	8-16 (C/S)	2	Dry	Dry	15.95
CP103	Dry*	8-16 (C/S)	2	Dry	Dry	15.95

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

Response Zones:

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

Notes

* water added to cable percussive boreholes during drilling, so identification of water strikes not possible.

4.4 In-Situ Geotechnical Testing

4.4.1 Standard Penetration Tests

In-situ standard penetration tests (SPTs) were undertaken, predominantly in the natural ground. The results are summarised in Table 4-3 and provided within the profile logs in Appendix B.

Approximate Depth (mbgl)	SPT 'N' Values					
	WS101	WS102	WS103	CP101	CP102	CP103
1-2	9 (MG)	5 (MG)	6 (MG)	8 (MG)	1 (MG)	-
2-3	13 (MG)	8 (MG)	18 (MG)	-	-	11 (MG)
3-4	18 (C)	1 (C)	>50 (C)	18 (C)	3 (MG)	-
4-5	>50 (C)	26 (C)	-	16 (C)	-	-
5-6	-	15 (C)	-	-	-	17 (C)
6-8				28 (C)	16 (C)	
8-10				31 (C)	-	
10-12				29 (C)	41 (C)	40 (C)
12-14				49 (C)		
14-15				>50 (C)	>50 (C)	>50 (C)
GW Level	2.4	2.5	Dry	Dry*	Dry*	Dry*

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

Notes:

MG = Made Ground; C=Clay.

Groundwater level based on strikes during investigation and monitoring data.

* water added to cable percussive boreholes during drilling, so identification of water strikes not possible.

4.5 Geotechnical Laboratory Testing

4.5.1 Single Stage Triaxial Test

Single stage triaxial testing has been undertaken on four samples of the natural clay strata. The results are presented in Appendix D and summarised in Table 4.4.

Location	Depth (mbgl)	Material Description	Undrained Shear strength (kPa)
CP101	4-4.45	Stiff brown silty sandy clay with rare gravel	82
CP101	8-8.45	Stiff brown silty sandy clay with rare gravel	123
CP102	2-2.45	Stiff brown silty sandy clay with rare gravel	120
CP102	5-5.45	Stiff brown silty sandy clay with rare gravel	90
CP102	9.5-9.95	Stiff brown silty sandy clay with rare gravel	128
CP103	5-5.45	Stiff brown silty sandy clay with rare gravel	96
CP103	9-9.45	Stiff brown silty sandy clay with rare gravel	108
CP103	13-13.45	Stiff brown silty sandy clay with rare gravel	120

Table 4-4: Summary of multi/single stage triaxial results.

4.5.2 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 D and summarised below in Table 4-5.

Location	Depth (mbgl)	Material	Percent passing through sieve		
			63mm	2mm	0.063mm
CP102	0.0-1.2	Brown silty sandy fine to coarse GRAVEL	100	31	8
CP102	1.2-1.65	Stiff brown silty sandy CLAY with occasional gravel.	100	88	52
CP102	8-8.45	Stiff brown silty sandy clay with rare gravel	100	98	74
CP101	24-24.45	Brown grey silty fine to coarse SAND with rare gravel	100	94	10
CP101	2-2.45	Brown clay bound silty SAND and GRAVEL.	100	48	26

Table 4-5: Summary of particle size distribution results.

Notes:

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

4.5.3 Atterberg Limits

Representative samples of natural clay were subjected to Atterberg Limits (plasticity) and Moisture Content testing. Results are presented in Appendix D and summarised in Table 4-6.

Table 4-6 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	3.5-4.0	20	43	18	25	CL	100	25
WS102	2.7-3.0	40	59	20	39	CL	99	38.6
WS105	2.4-3.0	19	45	17	28	CL	100	28

Table 4-6: Summary of plasticity index testing.

The modified plasticity index is between 25% and 38%. This characterises the clay as having a medium volume change potential.

4.5.4 Compressive Strength Testing

Uniaxial Compressive Strength (UCS) tests have been undertaken on three samples of the competent sandstone strata. In addition, a total of forty point load tests were undertaken on rock core samples recovered. The results are presented in Appendix D and summarised in Tables 4-7 and 4-8.

Location	Depth (mbgl)	UCS (MPa)	Rock Strength Classification
CP101	25-26	20.1	Weak
CP101	27-28	18.9	Weak
CP102	30-31	7.6	Very Weak
CP102	31-33	8.9	Very Weak
CP103	29-30.5	11.7	Very Weak

Table 4-7: Summary of UCS results.

Location	Depth (mbgl)	Is (MPa) range	Is ₍₅₀₎ (MPa) range	Mean Is ₍₅₀₎ MPa
CP101	24-27	0.06-0.26	0.07-0.33	0.2
CP102	30-33	0.18-0.39	0.25-0.39	0.33
CP103	29-32	0.18-0.24	0.23-0.30	0.24

Table 4-8: Summary of Point Load Test results.

4.5.5 Sulphate and pH

Water soluble sulphate and pH tests were carried out on soil samples. Full results are presented in Appendix C and summarised in Table 4-9.

Strata	pH	Sulphate (g/l)
Made Ground	7.6-11.8	<0.01-0.27
Natural	8-8.2	0.08-0.13

Table 4-9: Summary of pH and sulphate results.

5 Geotechnical Assessment

5.1 Proposed Development

It is understood that the proposed development will comprise a 220 bed hotel in central Manchester consisting of nine storeys of hotel rooms over a ground floor bar and restaurant space. Ancillary rooms are also provided at ground floor including substation, plant room and staff welfare.

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 comments/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 proposed development it is considered that the structure meets the criteria of Geotechnical Category 1 of Euro Code 7.

5.2 Summary of Ground Conditions

Ground conditions identified at the site are detailed in Section 4.1 and summarised in Table 5-1 below:

Strata	Typical Description	Min Depth to top of Strata (mbgl)	Max Depth to top of Strata (mbgl)	Thickness (m)
Made Ground	Hardstanding of concrete or tarmacadam over variably sandy gravelly silt containing brick, concrete, ash and clinker with rare timber, plastic and metal (demolition rubble).	0.00	0.00	1.50-3.50
Cohesive	Very stiff brown variably sandy gravelly CLAY (Glacial Till).	1.50	3.50	12.00-13.50
Granular	Dense to very dense red brown SAND and GRAVEL (weathered Chester Formation).	15.00	15.50	8.00-13.00
Bedrock	Interbedded SANDSTONE and MUDSTONE (Chester Formation).	27.50	28.00	Not proven

Table 5-1: Summary of ground conditions.

5.3 Site Preparation

The site should be cleared and stripped in accordance with Series 200 of the Specification for Highway Works. This should include:

- » Underground storage tanks have been encountered on site, these should be safely decommissioned and removed, 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 foot print 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. 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:

- » Deep strip foundations in to the underlying Clay; and,
- » Deeper pile foundations.

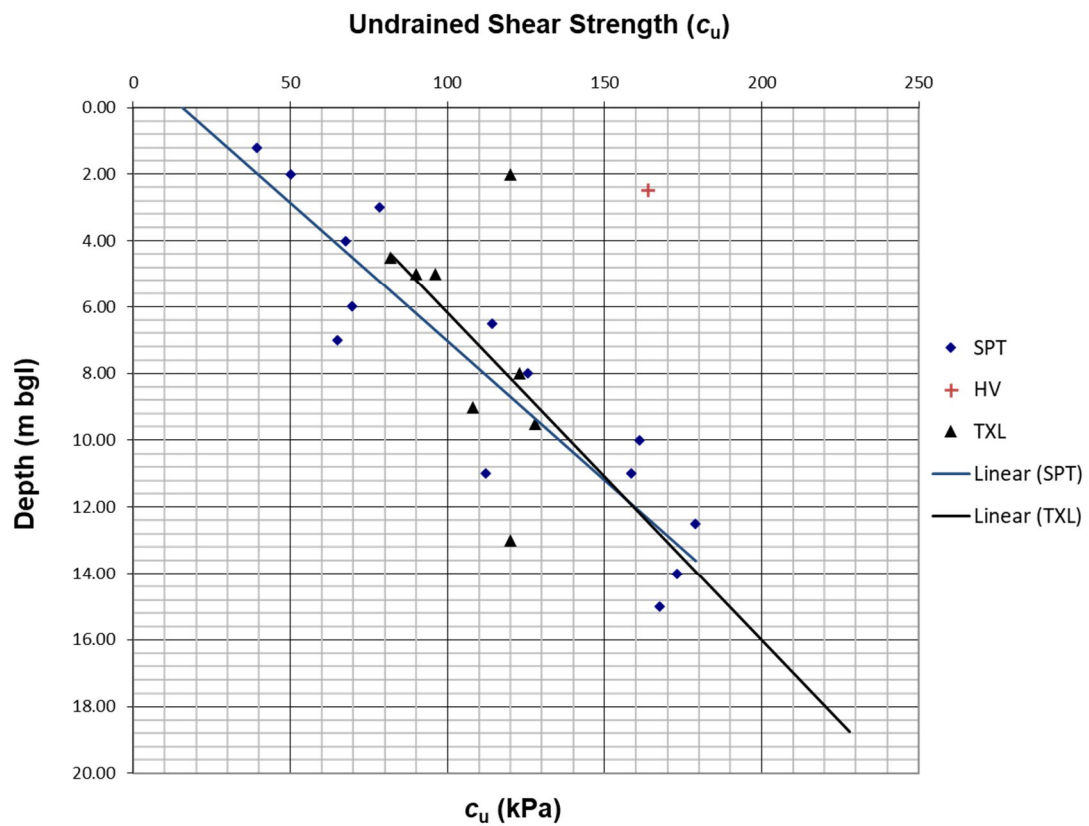
These options are discussed below:

Strength of the natural cohesive material has been assessed using in-situ testing by SPT and pocket penetrometer and by laboratory Triaxial testing. The results of the testing have been plotted against depth as is shown in Graph 5-1 below.

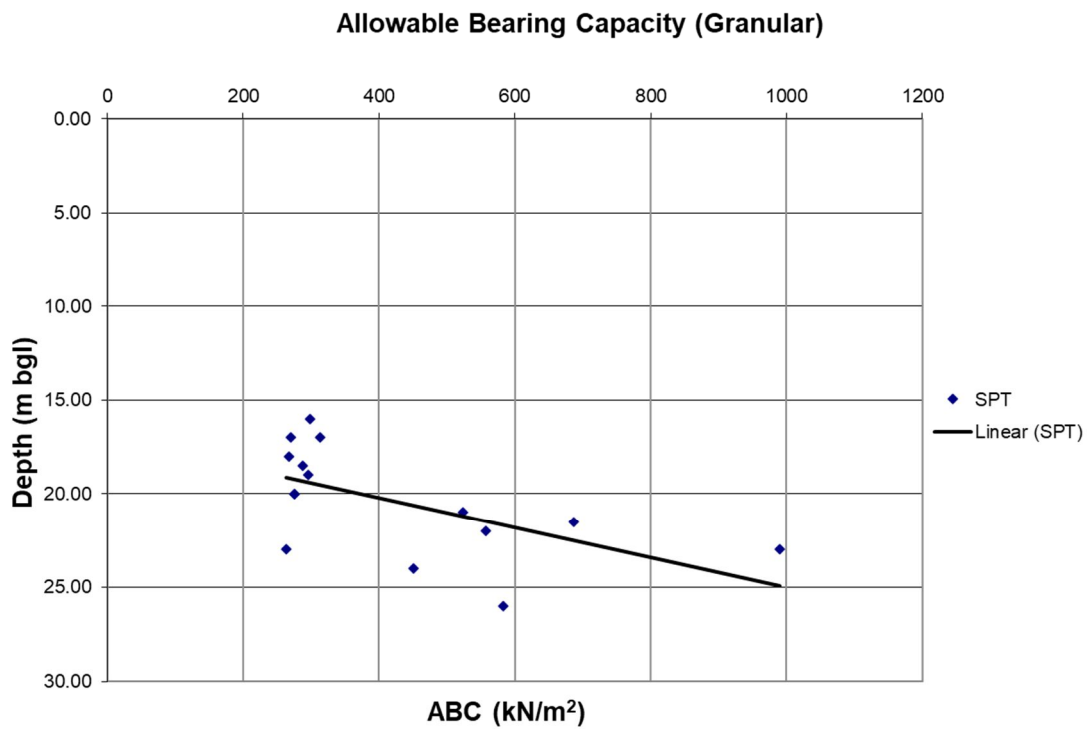
From Graph 5-1 it can be seen that the strength of the cohesive deposits typically increases with depth with the results of the in-situ SPT tests correlating with the laboratory single stage undrained Triaxial (TXL) testing

A conservative c_u of 50kPa is assigned to the cohesive material from a depth of c. 2mbgl for the natural superficial deposits, returning an allowable bearing capacity (ABC) of 100kN/m² for standard strip foundations. The shear strength increases with depth to c.125kPa at a depth of 10mbgl.

Underlying the natural cohesive deposits from a depth of c. 15mbgl is very dense granular material returning SPT N values ranging between N43 and N>50. It is considered that this represents highly/completely weathered sandstone of the Chester formation. Where the SPT test reached 50 blows before reaching 300mm penetration the N value has be extrapolated and is shown as Allowable Bearing Capacity (ABC) vs depth on Graph 5-2 overleaf:



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



Graph 5-2: Summary of ABC vs depth from in-situ SPT testing.

Bedrock was cored from a depth of between 23.00m and 28.00mbgl and was comprised interbedded SANDSTONE and MUDSTONE of the Chester Formation. Selected samples of recovered core was sent to Murray Rix Geotechnical laboratory for Unconfined Compressive Strength (UCS) and Point Load (PL) testing.

5.4.2 Strip Foundations

Deep strip foundations should be constructed at least 150mm in to the underlying stiff clay. At this depth, an allowable bearing capacity of 100kN/m² has been calculated using a Factor of safety of 3 and an undrained shear strength of 50kN/m² taken from Graph 5-1.

Atterberg limits determinations, summarised in Table 4.6 show the clay to be of intermediate to high plasticity and as such the sides of the foundations may require protection using clay board or similar.

5.4.3 Piled Foundations

It is anticipated that the structure will utilise a piled foundation and as such piles will either comprise friction, end bearing or a combination of both. For preliminary purposes, the following initial pile carrying capacities have been calculated using skin friction within the clay deposits. When undertaking these preliminary calculations, the following parameters have been used:

- Undrained shear strength values from Table 4-4 and Graph 5-1;
- Adhesion Factor of 0.45 based on CFA piles;
- Factors of safety of 1.5 on side resistance and 3 on base resistance; and,
- Global Factor of safety of 2.5.

Depth	Pile Carrying Capacity (kN)		
	300mm dia	450mm dia	600mm dia
5	39	72	114
10	130	220	328
15	255	415	597

Table 5-2: Preliminary Pile Carrying Capacity.

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.

Made Ground has been recorded to a maximum proven depth of 3.5mbgl and consideration must be given to the potential for negative skin friction.

Results of UCS testing undertaken within the SANDSTONE and MUDSTONE at depths of between 24m and 33mbgl returned UCS values between 7.6 and 20.1MPa.

Results of PL testing returned $I_{s(50)}$ values of between 0.07 and 0.49MPa, averaging 0.25MPa. Published conversion factors between the point load and uniaxial compressive strength range between 12.6 and 30. A mid value conversion factor of 20 gives an estimated UCS of 5Mpa.

5.4.4 Pad Foundations

It is understood that sections of the structure will be single storey and is proposed to be supported on pad foundations. Pad foundations should be placed on the natural cohesive CLAY encountered at depths of between 1.50m and 3.50mbgl. For the

purpose of this assessment consideration is given to a pad foundation placed at a depth of 2mbgl founding upon the natural cohesive CLAY. Based upon the cu obtained from the in-situ and laboratory testing of the Glacial Till material (50kN/m² at 2mbgl), an assessment has been made on a pad foundation supporting column loads. For preliminary assessment purposes, two sizes of pad (1m² and 2m²) have been considered at a depth of 2mbgl. The ABC incorporates a Factor of Safety (FoS) of 3 for conservancy, results are shown in Table 5-1.

Pad Size	Pad Depth (mbgl)	Net Ultimate Bearing Capacity (Q _{nf}) kN/m ²	Allowable Bearing Capacity (kN)
1m ² (1.00m x 1.00m)	2mbgl	392	152
2m ² (1.42m x 1.42m)		844	324

Table 5.1: Summary of pad ABC.

The pads show an ABC of 152kN for a 1m² pad and 324kN for a 2m² pad foundation placed at a depth of 2mbgl in the target stratum of firm becoming stiff and very stiff CLAY (Glacial Till). Strip foundations supporting cladding walls should be able to support loadings of 100kN/m².

The above is for assessment purposes only, foundation design should be undertaken by a specialist contractor.

5.5 Ground Floor Slabs

Due to the presence of varying thickness' up to 3.5m depth of Made Ground across the site it is considered that the proposed structure will be supported by a piled foundation and as such will utilise a suspended floor to minimise any potential differential settlements between the floor and the shell.

5.6 Drainage

The presence of substantial depths of Made Ground across the site may result in settlement. It is therefore recommended that drain runs are designed using steeper gradients and flexible joints to allow for some differential settlement.

5.7 Concrete Durability

Based upon the results of the chemical analyses summarised in Table 4-9, it is considered that subsurface concrete can be designed in accordance with Design Sulphate Class DS-1, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-1 in accordance with the recommendations provided in BRE Special Digest 1 (2005).

5.8 Excavations

Site observations indicated that excavations should be feasible in the near surface with normal plant, however, obstructions were identified in the near surface including underground storage tanks, former foundations and former floor slabs. It is anticipated that any obstructions will be grubbed out during the reduced level dig for the sub structure works.

Some of the exploratory holes were observed to be unstable during the excavation/drilling and the Made Ground included granular strata/demolition rubble material. 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 R97⁹. Groundwater seepages were noted in several exploratory holes, however, these were minor and it considered that conventional sump pumping should be adequate.

5.9 Construction Activity and Inspection

The following activities and inspections should be incorporated in to 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 foundation construction;
- » 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;
- » 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).

⁹ CIRIA Report 97 – Trenching Practice – Second Edition (2001 revision)

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 (CLR11¹⁰). 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).

C4SLs were published in 2013^{11,12}. The recent change to the contaminated land guidance has changed the evaluation of risk from 'minimal' (referred to as Health Criteria values (HCVs))¹³ used to generate Soil Guideline Values (SGVs) to 'low' (referred to as Lowest Level of Toxicological Concern (LLTCs)). The policy companion document and supporting letter by Defra, dated 3rd September 2014, states that C4SLs *'could be used under the planning regime, as well as within Part 2A'*. Based on these comments LKC considers the justifications and assumptions used to generate 'low' risk are suitable for the planning regime.

Where no C4SLs have been generated LKC will use the LQM S4ULs¹⁴. Similar assumptions and land uses to C4SLs have been used. However, toxicological information has been based on 'minimal risk' as per previous guidelines and assumptions^{15,16,17,18}.

If contaminants are not present as C4SLs and S4ULs then LKC will use ATRISK SSVs or CL:AIRE GACs¹⁹. These follow the 'minimal' risk principle and more stringent exposure parameters and will be conservative.

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

¹⁰ EA (2004). "Model Procedures for the Management of Land Contamination." R&D Publication CLR 11.

¹¹ Defra (2014). "SP1010: Development of Category 4 Screening Levels and Assessment of Land Affected by Contamination – Policy Companion Document."

¹² CL:AIRE (2013). "SP1010: Development of Category 4 Screening Levels and Assessment of Land Affected by Contamination – Final project Report."

¹³ EA (2008). "Human Health Toxicological Assessment of Contaminants in Soils." Science Report – SC050021/SR2.

¹⁴ LQM (2014). "The LQM/CIEH S4ULs for Human Health Risk Assessment."

¹⁵ EA (2008). "Updated Technical Background to the CLEA Model." Science Report – SC050021/SR3.

¹⁶ EA (2008). "Human Health Toxicological Assessment of Contaminants in Soils." Science Report – SC050021/SR2.

¹⁷ EA (2008). "A Review of Body Weight and Height Data used within the Contaminated Land Exposure Assessment Model (CLEA)." Project SC050021/Technical Review 1.

¹⁸ EA (2009). "Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values." Science report SC050021/SR7.

¹⁹ CL:AIRE (2009). "The Soil Generic Assessment Criteria for Human Health Risk Assessment."

PAHs^{20,21} and naphthalene the most volatile and soluble²². 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 negligible²³. For B(a)P to be used as a surrogate marker it should follow the profile described by the HPA (2008)²⁴ and CL:AIRE (2013). Naphthalene will be treated separately using the LQM S4ULs.

The proposed development is for a hotel building, therefore the assessment criteria for commercial land use has been used.

All criteria have been generated using the CLEA V1.06 model²⁵ 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 E. ATRISK SSVs and CL:AIRE GACs were not required for this dataset and have not been included.

B(a)P as Surrogate Marker

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 as per HPA and CL:AIRE guidelines. The primary toxicological study related to Culp *et al.*²⁶, 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.

²⁰ EA (2002). "Contaminants in Soils: Collation of Toxicological Data and Intake Values for Humans. Benzo[a]pyrene." R&D Publication TOX2.

²¹ USEPA (1984). "Health Effects Assessment of Polycyclic Aromatic Hydrocarbons (PAHs). EPA 540/1-86-013."

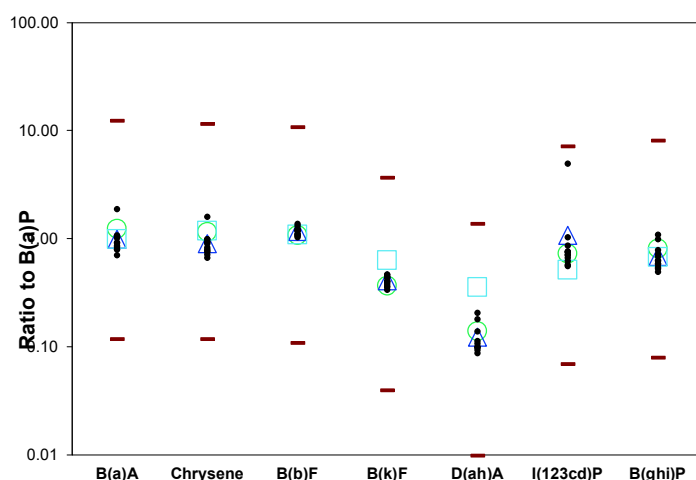
²² EA (2003). "Review of the Fate and Transport of Selected Contaminants in the Soil Environment." Draft technical report P5- 079/TR1.

²³ CL:AIRE (2013). "SP1010: Development of Category 4 Screening Levels and Assessment of Land Affected by Contamination – Final project Report."

²⁴ HPA (2010). "HPA Contaminated Land Information Sheet: Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs)." Version 3.

²⁵ EA (2008). "CLEA Software (Version 1.05) Handbook." Science Report – SC050021/SR4.

²⁶ 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.



Graph 6-1: The ratio of PAH to B(a)P in soil for all available data at the site based on 13no. 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.

6.2.2 Soil Results Comparison against Assessment Criteria

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

Contaminant	Units	No. of samples	Elevated Results	Sample Location	Criteria	Source of Criteria
Metals						
Lead	mg/kg	13	9,000	TP105 (0.3-0.6m)	2,300	C4SL
GENERAL						
pH	pH	13	Range 7.6 to 11.8			
SOM	%	13	Range 1.9 to 45			
Asbestos	N/A	13	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 (%)
WS102 (0.2-0.6m)	Chrysotile	Bitumen	0.006
TP106 (0.2-0.6m)	Chrysotile	Fibres/clumps	0.001

Table 6-2: Details of asbestos identified.

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 Agency²⁷ 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 WS103 0.1-0.5m and TP104 0.55-0.6m and the datasheets are presented in Appendix F. A HI was not calculated for the remaining samples as no or minimal petroleum hydrocarbons fractions were present.

The HI for the two samples assessed were below 1 and, therefore, no further consideration is required for the potential additivity of toxicological effects of hydrocarbon fractions.

6.2.4 Direct Contact Risk – Pollutant Linkage 1

Elevated lead was recorded in one sample of made ground in the north of the site and the source of this contamination is considered to be ash and clinker encountered in this location. No other elevated concentrations of metals, PAHs or petroleum hydrocarbons was recorded.

Given the limited soft landscaping on the site and, as only one sample has recorded an exceedance of the commercial GAC, the probability of the metals, PAHs or petroleum hydrocarbons affecting site users is unlikely. With a medium consequence, the risk is considered to be low and no specific remediation is recommended.

Asbestos was identified in two samples of made ground in the east of the site. However, as only limited soft landscaping will be present in the proposed development, therefore the probability of asbestos affected site users is considered to be unlikely. With a severe consequence, the risk is moderate / low. At this stage, a low risk is assumed, and remediation is not required. However, as a precaution, construction workers should be and vigilant for any suspected ACM during groundworks (discussed further in Section 9).

6.2.5 Risk from Inhalation of Vapours – Pollutant Linkage 2

Although visual and olfactory evidence of petroleum hydrocarbon was noted during the intrusive investigation, no elevated concentrations of volatile contaminants were recorded in the samples tested. In addition, no potential additive effect of petroleum hydrocarbon fractions was identified from the hazard indices assessment.

LKC therefore consider the probability of volatile contaminants affecting site users as unlikely. The consequence is expected to be medium, giving a low risk and no remediation is required with respect to pollutant linkage 2.

6.3 Gas Risk Assessment

Gas monitoring was not carried out as part of this assessment. The PRA identified a moderate/low risk and recommended gas monitoring if a significant thickness of made ground or significant organic/putrescible strata was identified.

²⁷ EA (2005). "The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils." Science report P5-080/TR3.

Only limited organic / putrescible material (rare timber fragments) was encountered on site. Made ground comprised sandy gravelly silt containing brick, concrete, ash and clinker to a maximum depth of 3.5mbgl.

Given the ground conditions encountered, LKC considers the probability of gas posing a risk to site users as unlikely. The consequence is severe, which gives a moderate / low risk. Given the known ground conditions, LKC considers there to be a low risk and no further action is required with respect to pollutant linkage 3.

6.4 Controlled Water Assessment

LKC considers the Principal Aquifer as the primary receptor.

It was proposed to undertake groundwater sampling of the wells on site to assess the risk to the underlying aquifer but there was insufficient water in the wells to sample.

Although, potential sources of contamination which may impact the underlying aquifer were identified from the intrusive investigation, namely the two below ground former fuel storage tanks, there was no evidence to suggest significant leaks from the tanks as occurred.

A thin band of hydrocarbon impacted soil was encountered in TP204 at 0.55mbgl but a sample taken from the same location at 1mbgl recorded significantly less petroleum hydrocarbon concentrations indicating that the vertical migration of this contamination has been minimal. This is likely to be due to the absence of shallow groundwater to mobilise and transport any contaminants.

The significant thickness of impermeable natural clay will also inhibit the vertical migration of any contaminated water to the underlying aquifer.

Given the proposed development, the former below ground fuel tanks will need removing prior to development and any impacted material from around the tanks removed. This will, therefore, remove the main source of contamination identified on the site, reducing the risk to the underlying aquifer.

Based on the above, LKC considers the probability of contaminants on site affecting the Principal Aquifer as unlikely. Given the medium consequence, a low risk is anticipated (Pollutant Linkage 4) and no groundwater remediation is required. The removal of the former below ground fuel tanks is considered necessary for geotechnical purposes but will reduce the risk to controlled waters.

6.5 Additional Risk Assessments

6.5.1 Concrete (Pollutant Linkage 5)

As stated in Section 5, sulphate resistant concrete will not be required at the site. The site was classified as DS-1 AC-1s.

Based on the above, the probability of sulphate concentrations affecting buildings is unlikely. Given the consequence is considered to be mild, the risk (pollutant linkage 5) is anticipated to be low and no sulphate resistant concrete is required. This should be confirmed with the structural engineer.

6.5.2 Potable Water Supply (Pollutant Linkage 6)

Soil results were compared to United Utilities (UU) guidelines for the selection of potable water pipes in land potentially affected by contamination²⁸. 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: chlorinated compounds, cresols, ethers, nitrobenzene, ketones, aldehydes and amines.

The following elevated contaminants were identified:

- Elevated petroleum hydrocarbons in the centre of the site.
- Elevated TVOCs (inc. naphthalene) in made ground across the site.

It is likely that barrier pipe will be required on site subject to the depth and location of the water pipes and in consultation with UU.

Once details of the pipeline location and depths are known a UU Risk Assessment should be undertaken.

At this stage, the probability of organic contaminants affecting potable water pipes is likely. Given the consequence is considered to be medium, the risk (pollutant linkage 6) is anticipated to be moderate risk and remediation (i.e. barrier pipe) is likely to be required (subject to further risk assessment).

6.5.3 Phytotoxicity (Pollutant Linkage 7)

Soil results were compared to phytotoxic guideline values as outlined in BS3882²⁹.

Elevated zinc (maximum concentration 750mg/kg) and copper (maximum concentration 9,600mg/kg) were identified. However, only limited soft landscaping is proposed and, therefore, the probability of phytotoxic contaminants affecting vegetation is considered to be low. With a minor consequence, the risk (pollutant linkage 7) is anticipated to be low and no formal remediation is considered necessary.

The characteristics of the made ground should be taken into account if it is to be used as a topsoil / growing medium for flora. The material should be assessed against the parameters outlined in Table 1 of BS3882 (not included within this assessment). Made ground with undesirable material (e.g. glass, brick, metal, pottery) was noted at shallow depth in some areas of the site. Irrespective of the contamination risk, this material should not be used as topsoil and it is recommended that a suitable topsoil of at least 150mm is placed over undesirable made ground if this is encountered in soft landscaped areas.

6.6 Revised Contamination Conceptual Model

The preliminary contamination conceptual model (Table 2-1) 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.

²⁸ UU(2011). "United Utilities Water Supplementary Guidance for the Selection of Water Pipes in Land Potentially Affected by Contamination."

²⁹ BS (2015). "Specifications for Topsoil and Requirements for Use." BS3882:2015.

The revised contamination conceptual model is presented in Table 6-3.

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 is 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.

Further details of the remedial proposals are given in Section 9.

Pollutant Linkage	Pathway	Receptor	Contaminant (source)	Probability	Consequence	Risk	Assessment and Recommendations
PL1	-Dermal contact. -Inhalation of soil, fibres and dust. -Ingestion of soils, dust, vegetables, soil attached to vegetables. -Windblown dust.	-Future site users. -Offsite receptors.	-Heavy Metals. -ACM -PAHs. -Hydrocarbons. -Other inorganic and organic contaminants. -(made ground, former filling station on site, car park)	Unlikely	Medium	Low	-Unlikely probability as only one exceedance of commercial GACs identified for lead. Only limited soft landscaping proposed as part of the development, therefore exposure to made ground minimal. -Recommendation: No remediation required.
PL2	-Inhalation of vapours. -Migration through permeable strata and preferential pathways.	-Future site users. -Offsite receptors.	-Volatile Contaminants such as hydrocarbons, solvents, antifreeze (made ground, former filling station, and car park on site).	Unlikely	Medium	Low	-Unlikely probability as no elevated volatile contaminants identified compared to commercial GACs. -No elevated PID readings during the intrusive investigation. -Recommendation: No remediation required.
PL3	-Inhalation of gas. -Migration through permeable strata and preferential pathways. -Explosion in confined spaces.	-Future site users. -Buildings. -Offsite land users.	-Methane, carbon dioxide. (potentially infilled features 250m of the site).	Unlikely	Severe	Moderate / Low	-Unlikely probability as no viable source of hazardous gas identified during the intrusive investigation. -Recommendation: No gas protection measures required.
			-Volatile hydrocarbon odours (former onsite filling station).	Unlikely	Severe	Moderate / Low	-Unlikely probability as no evidence of significant volatile hydrocarbon odours from the below ground fuel tanks. -No evidence identified of significant leaks from the tanks. -Recommendation: No vapour monitoring required.
PL4	-Surface Run-off. -Migration through permeable strata and preferential pathways -Perched waters migration.	-Groundwater (Principal Aquifer).	-Mobile contaminants such as metals, PAHs, hydrocarbons, volatile compounds (made ground, former filling station, and car park on site).	Unlikely	Medium	Low	-Unlikely probability as no groundwater encountered within the monitoring wells or boreholes during the intrusive investigation and no evidence of significant mobile contamination. -Recommendation: No groundwater remediation required.
PL5	-Sulphate attack on concrete.	-Building structure.	-Sulphate (ash potentially in made ground).	Unlikely	Mild	Low	-Unlikely probability as no aggressive ground conditions or elevated soluble sulphate identified from soil testing. -Recommendation: No sulphate resistant concrete required. Concrete classification of DS-1 AC-1.
PL6	-Ingestion of tainted water supply.	-Future site users. -Water pipes.	-Organic Contaminants such as hydrocarbons, solvents (made ground, former filling station, and car park on site).	Likely	Medium	Moderate	-Likely probability as contamination identified that may impact below ground potable water pipes. -Recommendation: UU Risk Assessment to be completed once route and depths of potable water pipes are known. It is likely that the site will require barrier pipe.
PL7	-Direct Contact (plant uptake).	-Flora.	-Phytotoxic Contaminants (made ground).	Likely	Minor	Low	-Low probability as contamination considered possible, which may be taken up by flora in soft landscaping. -Recommendation: Suitable growing media in soft landscaped areas.

Table 6-3: Revised Contamination Conceptual Model.

7 Waste Disposal Assessment

The soil contamination results as presented in Appendix C 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 Hazwaste Online™. This is a web-based facility that allows an assessment waste as either hazardous or non-hazardous waste based on relevant guidance and legislation^{30, 31, 32, 33, 34, 35, 36, 37, 38}.

Hazwaste Online™. 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).

The output sheet is presented in Appendix G and the locations where soil would be deemed to be hazardous waste if excavated is shown in Table 7-1.

Sampling Location	LoW Code	Hazard (Risk Phrase)	Contaminants
TP204 0.55-0.6m	17 05 03	HP3(i) Flammable, HP7 (Carcinogenic), HP11 (Mutagenic)	TPH (C6-40)
TP205 0.2-0.5m	17-05-03	HP8 (Corrosive)	pH
WS103 0.1-0.3m	17-05-03	HP3(i) Flammable, HP7 (Carcinogenic), HP11 (Mutagenic)	TPH (C6-40)
TP105 0.2-0.6m	17-05-03	HP10, HP14 (Ecotoxic)	lead, copper

Table 7-1: Summary of Hazwaste Online™ findings.

Based on individual locations, hazardous waste has been identified. The soil from the locations shown in Table 7-1 should be classified as **HAZARDOUS WASTE** once excavated. Further waste classification testing may be required once surplus soils have been excavated.

³⁰ EA (2018). "Guidance on the Classification and Assessment of Waste (1st Edition v1.1)". Technical Guidance WM3.

³¹ CLP Regulation - Regulation 1272/2008/EC of 16 December 2008.

³² 1st ATP - Regulation 790/2009/EC of 10 August 2009

³³ Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

³⁴ WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

³⁵ Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014

³⁶ 13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

³⁷ POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004

³⁸ 2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

8 Conclusions

8.1 Geotechnical

Site preparation works should include the grubbing out of former below ground structures and removal of the former below ground fuel tanks.

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:

- » Deep strip foundations in to the underlying Clay; and,
- » Deeper pile foundations.

Deep strip foundations, if utilised, should be constructed at least 150mm in to the underlying stiff clay. At this depth, an allowable bearing capacity of 100kN/m² has been calculated using a factor of safety of 3 and an undrained shear strength of 50kN/m².

It is anticipated that the structure will utilise a piled foundation and as such piles will either comprise friction, end bearing or a combination of both. Detailed piling design should be undertaken by a suitably qualified and experienced piling contractor.

Due to the presence of varying thickness' up to 3.5m depth of Made Ground across the site it is considered that the proposed structure will be supported by a piled foundation and as such will utilise a suspended floor to minimise any potential differential settlements between the floor and the shell.

No sulphate resistant concrete is required (DS-1 AC-1).

Further advice on foundation design should be sought from a structural engineer.

8.2 Contamination Assessment

A revised contamination conceptual model has been produced by LKC which is summarised in Table 8-1 below (more detailed model provided in Section 6).

Pollutant Linkage		Risk	Recommendations
1	Contaminants posing a risk to site users via dermal contact, ingestion and inhalation (of soil, dust, fibres and vegetables).	Low (ACM, metals, PAHs, hydrocarbons)	No remediation required.
2	Volatile contaminants posing a risk to site users via the inhalation of vapours.	Low	No remediation required.
3	Gas posing a risk to buildings and site users via the migration of gas into building causing explosion and asphyxiation.	Moderate/Low	No gas protection measures required.
4	Mobile contamination posing a risk to controlled waters via the migration through permeable strata.	Low	No remediation required.
5	Sulphate posing a risk to building via direct contact (sulphate attack).	Low	Sulphate resistant concrete not required. Concrete classification of DS-1 AC-1.
6	Organic contaminants posing a risk to water pipes.	Moderate/Low	UU risk assessment to be completed. The site is unlikely to require barrier piping if new water pipes are installed.
7	Phytotoxic metals posing a risk to flora via root uptake.	Very Low	No remediation required.

Table 8-1: Summary Risk Table.

Remedial recommendations are presented in Section 9.

9 Recommendations and Remedial Strategy

The recommendations provided below are considered appropriate for the site based on the site investigation work undertaken. LKC should stress that no remediation, enabling works or designing works should take place until Regulatory approval has been obtained.

9.1 Remediation and Validation Recommendations

Table 9-1 details the further works and remedial recommendations / requirements.

PL	Remediation Requirements	Validation Requirements
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.
2, 4	<u>Below Ground Fuel Tank Removal</u> Although no evidence of significant leaks from the former below ground fuel tanks was identified, the tanks will need decommissioning and removing as part of the groundworks. This should be undertaken by a specialist contractor and further samples are recommended from the excavation following removal of the tanks to confirm the absence of contamination.	Details of work undertaken including photographs. Confirmatory samples of the remaining in-situ soils. Consignment notes confirming the removal of any impacted soil
6	<u>Potable Water Pipes</u> It is recommended that a United Utilities Risk Assessment is undertaken once the location and depth of potable water pipes are known. It is likely that barrier pipe will be required.	Delivery Notes of Pipe Material. Photographs of the Installed Pipe.
<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 ³⁹): 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.		

³⁹ <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](#).

Topsoil Growing Medium

Although no contamination was identified in the soils on site, the existing made ground is not expected to be a suitable growing medium given the nature of the soil and the undesirable material present (e.g. glass, brick fragments, clinker and ceramics).

A topsoil cover of approximately 150mm is recommended in soft landscaping areas.

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 C733⁴⁰.

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)⁴¹.

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.

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 guidance⁴²) should be adopted by all workers involved with site enabling and construction works.

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 Principal 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 Agency⁴³.

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

Notes: See Table 6-3 for pollutant linkage (PL) details.

⁴⁰ CIRIA (2014). "Asbestos in Soil and Made Ground: A Guide to Understanding and Managing Risks". C733.

⁴¹ HSE (2012). "Removing Asbestos Cement (AC) Debris." A11 Asbestos Essential – Non-licenced Tasks.

⁴² HSE (1991). "Protection of Workers and the General Public During Development of Contaminated Land" London HMSO.

⁴³ Environment Agency (2001) Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention.

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	Greenfield	Suite A	1 sample per 50m³
	Brownfield / Unknown	Suite B	
Subsoil	Brownfield / Unknown	Suite B	1 sample per 150m³
	Site won natural material / greenfield	Suite A	
	First Generation i.e. quarried sand (subsoil) or stone (break layer)	No testing is required. Certification of material provenance is required.	
Physical Stone Break Layer	Recycled Stone (6F2 / screened)	Suite B	1 sample per 500m³

Table 9-2: Sampling requirements for imported 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.

Any soil with visual or olfactory evidence of hydrocarbons should be rejected.

In addition, it should be ensured that the matrix of the topsoil is suitable as a growing medium and no undesirable material is present (in line with BS3882⁴⁴). LKC advise this information is provided by the supplier before material is imported onto site.

Imported material to be used in soft landscaping will be compared against commercial use criteria (as used in the contamination risk assessment (Section 6-1)). Appropriate remedial target criteria are presented in Appendix E.

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:

- » Confirmation that no further contamination was identified following removal of the tanks including results of validation samples.
- » Provision of waste transfer documents.
- » Verification testing of all imported soil for soft landscaping areas.
- » Information on the installation of protective pipes and / or sterile trenches.

⁴⁴ BS (2015). "Specifications for Topsoil and Requirements for use." BS3882:2015.

- » 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.

Figures

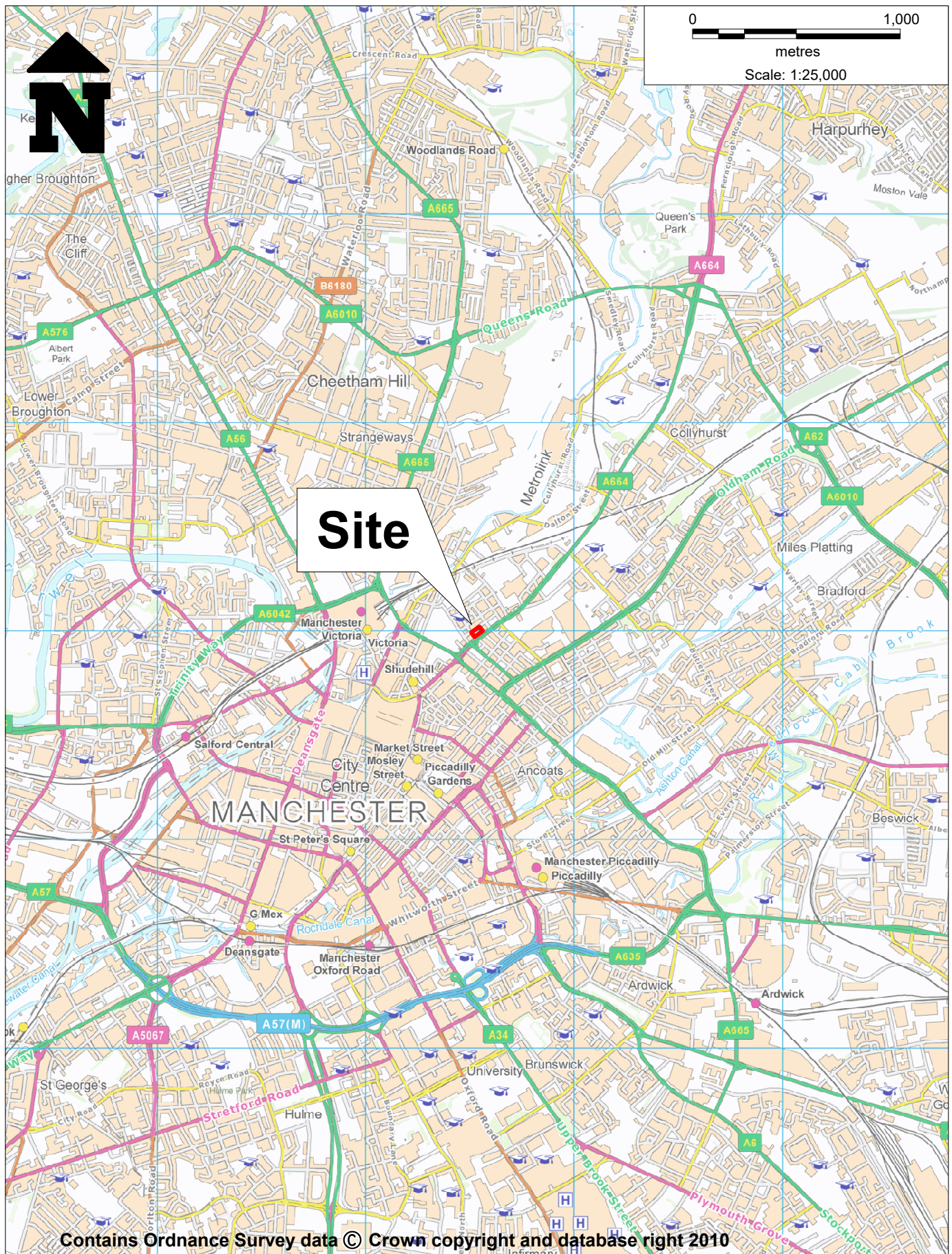
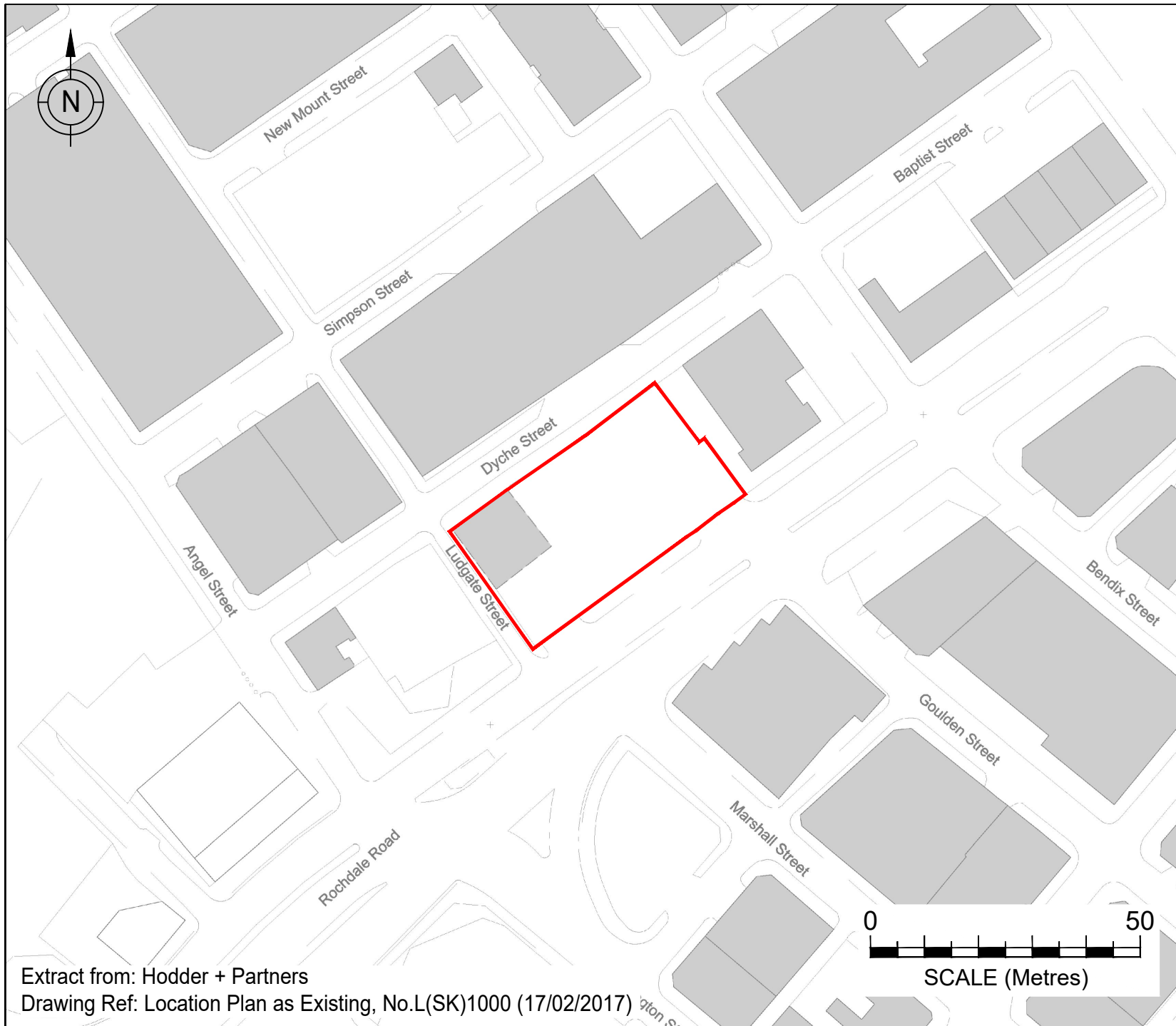


Figure 1: Site Location Plan, Land at Rochdale Road, Manchester

Drawn: April 2020 Scale: 1:25,000 @ A4 (see scale bar)



KEY

 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.

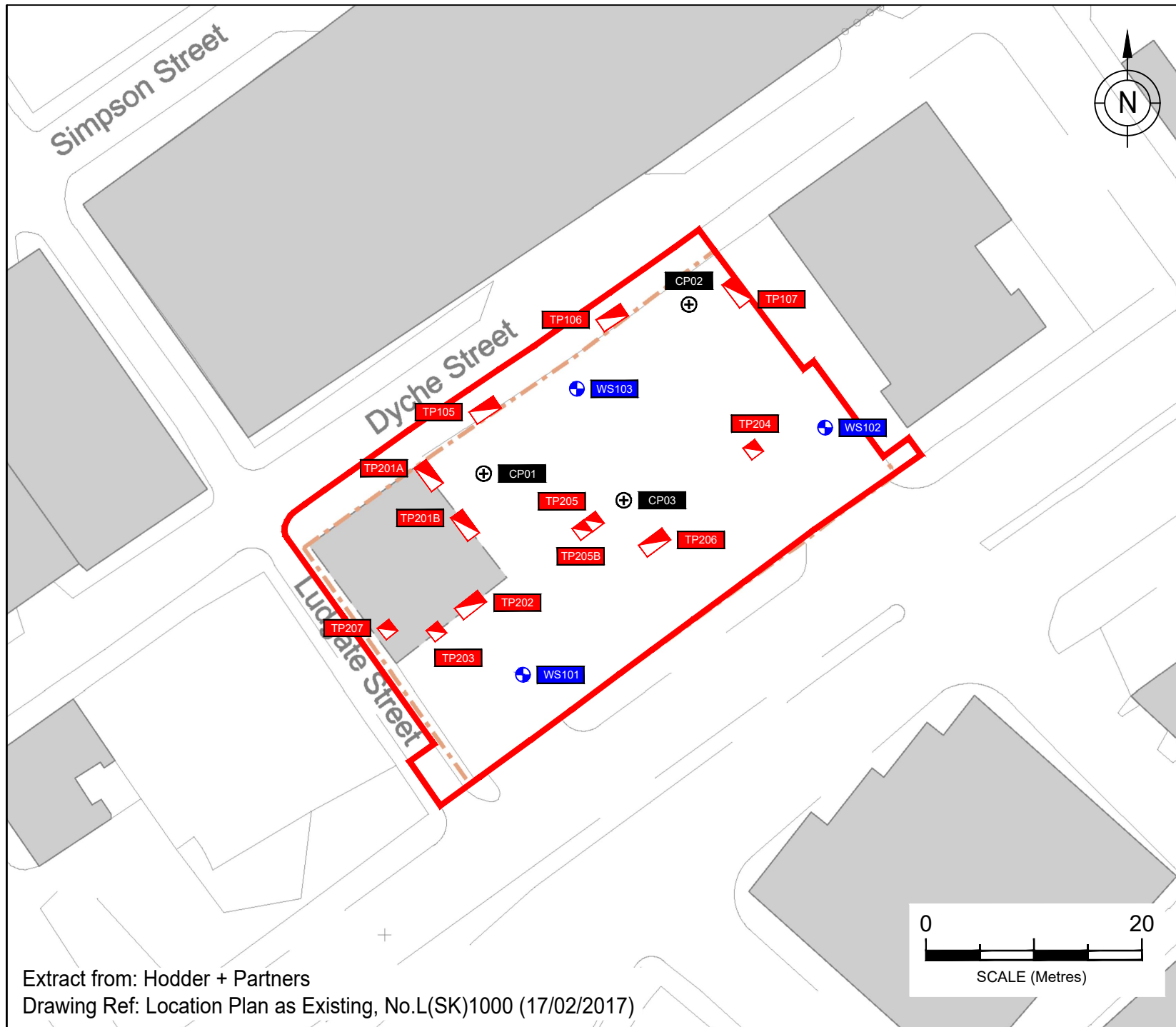


Client:			
Realty Estates Ltd			
Site:			
Land at Rochdale Road, Manchester			
Title:			
Site Boundary Plan			
Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 20 1328	1:x1000 @ A4		
Drawn By:	Checked By:	Drawn:	
AC	CH	Apr 2020	

Extract from: Hodder + Partners
Drawing Ref: Location Plan as Existing, No.L(SK)1000 (17/02/2017)

SCALE (Metres)

2



KEY

-  Site Boundary
-  Window Sample Borehole (WS)
-  Trial Pit (TP)
-  Cable Percussive Borehole (CP)

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:			
Realty Estates Ltd			
Site:			
Land at Rochdale Road, Manchester			
Title:			
Site Investigation Location Plan			
Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 20 1328	1:x500 @ A4	3	
Drawn By:	Checked By:	Drawn:	
AC	MA	Apr 2020	

Extract from: Hodder + Partners
Drawing Ref: Location Plan as Existing, No.L(SK)1000 (17/02/2017)

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 552⁴⁵. 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 result 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.

⁴⁵ 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

Profile Logs and Cross Sections

Excavation Method

Drive-in Windowless Sampler
to 4.45mbgl.

Dimensions
Location (Handheld GPS)
384535 E 398978 N

Ground Level (mOD)

53.00

Client

Civic Engineers

Job
Number
LKC 20 1328

Engineer
Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.20-0.50 0.40-0.60 0.50-0.70	D1 D PID = 0.0ppm D2			52.80	(0.20) 0.20	MADE GROUND: Grey slightly sandy GRAVEL. Sand is medium. Gravel is coarse, angular to subangular of limestone.			
1.20-1.65	SPT N=9		2,2/3,2,2,2		(2.30)	MADE GROUND: Light brown gravelly SAND with occasional brick fragments and clinker. Sand is medium. Gravel is medium to coarse angular to subangular of mixed lithologies. At 0.50mbgl becomes dark brown with very frequent brick fragments.			
2.00-2.45	SPT N=13		2,3/6,3,2,2			Limited recovery between 1.00-2.00mbgl.			
2.50-3.00 2.50-3.00	D3 PP 13.3 kPa		Water strike(1) at 2.40m.	50.50	2.50	At 2.40mbgl layer of brown slightly clayey slightly gravelly SAND approximately 0.10m thick.			
3.00-3.45	SPT N=18		3,3/4,4,5,5	49.80	(0.70) 3.20	Soft to firm consistency low strength brown mottled orange slightly gravelly slightly sandy CLAY. Sand is fine to medium. Gravel is fine to medium of coal and other mixed lithologies.			
3.50-4.00	B4				(1.25)	Stiff consistency high strength brown slightly gravelly CLAY Gravel is fine subangular to subrounded of mixed lithologies.			
4.00-4.45	SPT N=50		9,10/11,12,13,14	48.55	4.45	Complete at 4.45m			

Remarks

Groundwater encountered at 2.40mbgl.
Grid reference estimated from <https://gridreferencefinder.com/>
Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>
Refusal at 4.45mbgl.

Scale
(approx)
1:50

Logged
By
Figure No.
LKC 20 1328.WS101

Excavation Method

Drive-in Windowless Sampler
to 5.45mbgl.

Dimensions
Location (Handheld GPS)
384560 E 399000 N

Ground Level (mOD)

53.00

Client

Civic Engineers

Job
Number
LKC 20 1328

Engineer
Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.20-0.60	D1 PID = 0.0ppm			52.80	(0.20) 0.20	MADE GROUND: Tarmacadam.			
1.20-1.65 1.20-2.00	SPT N=5 D2		1,2/2,1,1,1		(2.40)	MADE GROUND: Dark orangish brown slightly gravelly SAND with very frequent brick fragments, occasional clinker and rare slate, becoming darker and blackish with depth. Sand is medium. Gravel is medium to coarse subangular to angular of mixed lithologies.			
2.00-2.45 2.00-2.45	SPT N=8 X		1,2/2,2,2,2						
2.60-3.00 2.70-3.00	D3 B4		Water strike(1) at 2.50m.	50.40	2.60	Firm to stiff consistency high strength brown mottled grey and light brown slightly gravelly CLAY. Gravel is fine, subangular to subrounded of coal and other mixed lithologies. At 2.90mbgl becomes grey.			
3.00-3.45 3.00-3.45	SPT N=1 X		1,0/0,,0,1						
3.50-4.00 3.50-4.00	B5 PP 114.7 kPa					At 3.40mbgl becomes brown, stiff and high strength.			
4.00-4.45 4.00-4.45 4.00-5.00	SPT N=26 X B6		4,4/5,6,7,8		(2.85)				
5.00-5.45 5.00-5.45	SPT N=15 X		2,3/3,4,4,4	47.55	5.45	Complete at 5.45m			

Remarks

Groundwater encountered at 2.50mbgl.
Grid reference estimated from <https://gridreferencefinder.com/>
Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>
Scale
(approx)

1:50

Logged
By

MA

Figure No.

LKC 20 1328.WS102

Excavation Method

Drive-in Windowless Sampler
to 3.34mbgl.

Dimensions
Location (Handheld GPS)
384542 E 399007 N

Ground Level (mOD)

53.00

Client

Civic Engineers

Job
Number
LKC 20 1328

Engineer
Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.10-0.50	D1			52.90	0.10	MADE GROUND: Grey slightly sandy GRAVEL. Sand is medium. Gravel is coarse, angular to subangular of limestone.			
0.50-1.20	D2					MADE GROUND: Dark brown gravelly sandy SILT with frequent brick fragments and occasional clinker. Sand is medium. Gravel is medium to coarse angular to subangular of mixed lithologies.			
1.20-1.65 1.20-1.65	SPT N=6 X		3,4/2,2,1,1		(2.30)				
2.00-2.45 2.00-2.45	SPT N=18 X		3,4/10,3,3,2						
2.40-3.00 2.50-3.00	B3 PP 163.7 kPa			50.60	2.40	Very stiff consistency high strength brown slightly mottled grey slightly gravelly CLAY. Gravel is fine subangular to subrounded of mixed lithologies.			
3.00-3.34 3.00-3.34	SPT 40/190 X		17,10/15,16,9	49.66	3.34	Complete at 3.34m			

Remarks

Borehole was dry.
Grid reference estimated from <https://gridreferencefinder.com/>
Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>
Unable to take a disturbed sample at 2.40-3.45mbgl (D3) due to the stiffness of the clay and limited sample.

Scale
(approx)
1:50

Logged
By
MA

Figure No.
LKC 20 1328.WS103

Excavation Method

Hand Dug Excavation to 1.10mbgl.

Dimensions

0.30m x 0.30m x 1.10m

Ground Level (mOD)

53.00

Client

Civic Engineers

**Job
Number**

LKC 20 1328

Location (Handheld GPS)

384536 E 399006 N

Dates

06/04/2020

Engineer
Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30-0.60	D1			52.98	0.02	MADE GROUND: Tarmacadam.		
					(1.08)	MADE GROUND: Brown gravelly sandy SILT with occasional brick fragments clinker and rare plastic. Sand is medium. Gravel is medium to coarse angular to subangular of mixed lithologies. Concrete slab encountered at 0.20mbgl approximately 0.30m x 0.30m x 0.30m.		
						Concrete slab encountered at 0.65mbgl approximately 0.30m x 0.30m x 0.30m.		
				51.90	1.10	Complete at 1.10m		


Remarks

Hand dug pit was dry and stable.
Grid reference estimated from <https://gridreferencefinder.com/>
Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>
Scale (approx)

1:20

Logged By

MA

Figure No.

LKC 20 1328.TP105

Excavation Method

Hand Dug Excavation to 1.20mbgl.

Dimensions

0.30m x 0.30m x 1.20m

Ground Level (mOD)

53.00

Client

Civic Engineers

**Job
Number**

LKC 20 1328

Location (Handheld GPS)

384542 E 399012 N

Dates

06/04/2020

Engineer
Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20-0.50	1D			52.98	0.02	MADE GROUND: Tarmacadam.		
					(1.18)	MADE GROUND: Brown gravelly sandy SILT with occasional brick fragments clinker and rare plastic. Sand is medium. Gravel is medium to coarse angular to subangular of mixed lithologies. Concrete slab encountered at 0.50mbgl approximately 0.30m x 0.30m x 0.30m.		
				51.80	1.20	Complete at 1.20m		


Remarks

Hand dug pit was dry and stable.
Grid reference estimated from <https://gridreferencefinder.com/>
Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>
Scale (approx)

1:25

Logged By

MA

Figure No.

LKC 20 1328.TP106

Excavation Method

Hand Dug Excavation to
1.30mbgl.

Dimensions

0.30m x 0.30m x 1.30m

Ground Level (mOD)

53.00

Client

Civic Engineers

**Job
Number**

LKC 20 1328

Location (Handheld GPS)

384553 E 399009 N

Dates

06/04/2020

Engineer
Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.50	D1					MADE GROUND: Blackish yellowish brown gravelly sandy SILT with occasional whole bricks and concrete fragments. Sand is medium. Gravel is medium to coarse angular to subangular of mixed lithologies.		
					(1.30)	Old residual clay drain (dry) encountered at 0.80mbgl..		
				51.70	1.30	Complete at 1.30m		


Remarks

Hand dug pit was dry and stable.
Grid reference estimated from <https://gridreferencefinder.com/>
Elevation estimated from
<https://www.freemaptools.com/elevation-finder.htm>
Scale (approx)

1:20

Logged By

MA

Figure No.

LKC 20 1328.TP107

Excavation Method

Machine excavated trial pit to 0.25mbgl.

Dimensions

0.50 x 1.50 x 0.25m

Ground Level (mOD)

51.00

Client

Civic Engineers

**Job
Number**

LKC 20 1328

Location (Observed measurements)

384524 E 398998 N

Dates

16/04/2020

Engineer
Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				50.95	0.05	MADE GROUND: Concrete slabs.		
				50.80	(0.15)	MADE GROUND: Blackish brown gravelly sandy SILT with frequent brick fragments and occasional clinker. Sand is medium. Gravel is fine to medium angular to subrounded of limestone and other mixed lithologies.		
				50.75	0.20			
					0.25	MADE GROUND: Orange SAND. Sand is medium.		
						Terminated at 0.25m		


Remarks

Trial pit terminated at 0.25mbgl due to potential services indicated by orange sand.
Trial pit was dry and stable.
Grid reference estimated from <https://gridreferencefinder.com/>
Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>

Scale (approx)

1:20

Logged By

MA

Figure No.

LKC 20 1328.TP201A

Excavation Method

Machine Excavated Trial Pit
to 2.00mbgl.

Dimensions

0.50 x 1.50 x 2.00m

Ground Level (mOD)

51.00

Client

Civic Engineers

**Job
Number**

LKC 20 1328

Location (Observed measurements)

384525 E 398995 N

Dates

16/04/2020

Engineer
Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10-1.00	D1			50.95	0.05	MADE GROUND: Light grey GRAVEL. Gravel is medium to coarse angular to subangular of limestone.		
0.50-1.00	B2 PID = 0.0ppm					MADE GROUND: Blackish brown gravelly sandy SILT with frequent whole bricks, occasional concrete, ash and clinker and rare timber, plastic and metal wiring. Sand is medium. Gravel is medium to coarse angular to subounded of mixed lithologies. Concrete slab encountered at 0.10mbgl, approximately 0.05m thick.		
1.00-2.00	B3 PID = 0.0ppm				(1.95)	At 1.00mbgl becomes clayey.		
				49.00	2.00	Complete at 2.00m		


Remarks

Trial pit was dry and became unstable at 2.00mbgl.
Brick foundations lined the northeast and southwest edges of the trial pit to 1.40mbgl, overlying concrete.
Elevation estimated from
<https://www.freemaptools.com/elevation-finder.htm>
Grid reference estimated from <https://gridreferencefinder.com/>

Scale (approx)

1:20

Logged By

MA

Figure No.

LKC 20 1328.TP201B

Excavation Method

Mechanically Excavated Trial Pit to 2.50mbgl.

Dimensions

1.50 x 0.50 x 2.50m

Ground Level (mOD)

51.00

Client

Civic Engineers

**Job
Number**

LKC 20 1328

Location (Observed measurements)

384527 E 398988 N

Dates

16/04/2020

Engineer
Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30-1.00	D1			50.95 50.90	0.05 0.10	MADE GROUND: Reddish brown brick floor tiling. MADE GROUND: Yellowish brown SAND. Sand is medium. MADE GROUND: Blackish dark brown gravelly sandy SILT with frequent whole bricks, occasional concrete, clinker and rare plastic. Sand is medium. Gravel is medium to coarse angular to subounded of mixed lithologies.		
1.00-2.50	B2 PID = 0.0ppm				(2.40)			
				48.50	2.50	Terminated at 2.50m		


Remarks

Trial pit was dry and unstable at 2.50mbgl.
A brick wall lined the northern and western sides to the base of the pit.
Grid reference estimated from <https://gridreferencefinder.com/>
Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>

Scale (approx)

1:20

Logged By

MA

Figure No.

LKC 20 1328.TP202

Excavation Method

Mechanically Excavated Trial Pit to 1.60mbgl.

Dimensions

1.50 x 0.50 x 1.60m

Ground Level (mOD)

51.00

Client

Civic Engineers

**Job
Number**

LKC 20 1328

Location (Observed measurements)

384522 E 398986 N

Dates

16/04/2020

Engineer
Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30-0.90	D1			50.95 50.90	0.05 0.10	MADE GROUND: Reddish brown brick floor tiling. MADE GROUND: Yellowish brown SAND. Sand is medium. MADE GROUND: Blackish dark brown gravelly sandy SILT with frequent whole bricks, occasional concrete, clinker. Sand is medium. Gravel is medium to coarse angular to subounded of mixed lithologies. Very frequent brick fragments encountered bewteen 0.10 - 0.30mbgl. Old residual wiring and cables encountered at 0.20mbgl.		
1.00-1.60	B2 PID = 0.0ppm				(1.50)	Concrete slab encountered at 0.90mbgl.		
				49.40	1.60	Terminated at 1.60m		


Remarks

Trial pit was dry.
Grid reference estimated from <https://gridreferencefinder.com/>
Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>

Scale (approx)

1:20

Logged By

MA

Figure No.

LKC 20 1328.TP203

Excavation Method

Mechanically Excavated Trial
Pit to 2.00mbgl.

Dimensions

1.50 x 0.50 x 2.00m

Ground Level (mOD)

51.00

Client

Civic Engineers

**Job
Number**

LKC 20 1328

Location (Observed measurements)

384550 E 398996 N

Dates

16/04/2020

Engineer
Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10-0.50 0.10-0.50	B3 PID = 1.7ppm D1			50.90	(0.10) 0.10	MADE GROUND: Grey concrete.		
					(0.40)	MADE GROUND: Brown slightly silty SAND with occasional whole bricks. Sand is medium.		
0.55-0.60	D2			50.50 50.40	0.50 (0.10) 0.60	MADE GROUND: Blackish brown silty SAND with occasional whole bricks and a hydrocarbon odour. Sand is medium, Copper wire encountered at 0.55mbgl.		
				50.20	(0.20) 0.80	MADE GROUND: Grey concrete slabs.		
1.00-2.00 1.00-2.00	B5 PID = 0.3ppm D4				(1.20)	MADE GROUND: Dark brown gravelly sandy SILT with frequent brick fragments and occasional clinker. Gravel is medium to coarse angular to subrounded of mixed lithologies.		
				49.00	2.00	Terminated at 2.00m		


Remarks

Trial pit was dry and became unstable at 2.00mbgl.
Trial pit was lined with brick and concrete walls in every direction.
Elevation estimated from
<https://www.freemaptools.com/elevation-finder.htm>
Grid reference estimated from <https://gridreferencefinder.com/>

Scale (approx)

1:20

Logged By

MA

Figure No.

LKC 20 1328.TP204

Excavation Method

Mechanically Excavated Trial
Pit to 0.60mbgl.

Dimensions

1.50 x 0.50 x 0.60m

Ground Level (mOD)

51.00

Client

Civic Engineers

**Job
Number**

LKC 20 1328

Location (Observed measurements)

384540 E 398998 N

Dates

16/04/2020

Engineer
Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20-0.50 0.20-0.50	B2 PID = 0.0ppm D1			50.80	(0.20) 0.20	MADE GROUND: Grey concrete with rebar.		
				50.50	(0.30) 0.30	MADE GROUND: Brown gravelly sandy SILT with frequent bricks and clinker. Sand is medium. Gravel is medium to coarse angular to subrounded of ixed lithologies.		
				50.40	0.50 (0.10) 0.60	MADE GROUND: Grey concrete.		
						Terminated at 0.60m		


Remarks

Trial hole terminated at 0.60mbgl due to time constraints and breaking out concrete for 1 hour.
 Trial pit was dry and stable.
 Elevation estimated from
<https://www.freemaptools.com/elevation-finder.htm>
 Grid reference estimated from <https://gridreferencefinder.com/>

Scale (approx)

1:20

Logged By

MA

Figure No.

LKC 20 1328.TP205

Excavation Method

Mechanically Excavated Trial Pit to 1.50mbgl.

Dimensions

1.50 x 0.50 x 1.50m

Ground Level (mOD)

51.00

Client

Civic Engineers

**Job
Number**

LKC 20 1328

Location (Observed measurements)

384540 E 398998 N

Dates

23/04/2020

Engineer
Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30-0.60	D1			50.70	(0.30)	MADE GROUND: Grey concrete with rebar.		
				50.40	0.30 (0.30)	MADE GROUND: Brown and grey gravelly sandy SILT with frequent bricks, concrete and occasional clinker. Sand is medium. Gravel is medium to coarse angular to subrounded of ixed lithologies.		
0.85-1.40	D2			49.50	0.60 (0.90)	MADE GROUND: Grey concrete with rebar. Metal pipe encountered at 0.60mbgl approximately 0.05m in diameter. Hydrocarbon smell encountered from 0.70mbgl. Two metal, hollow diesel and petrol tanks encountered at 0.85mbgl (1.70m x 1.90m) to the base of the trial pits.		
					1.50	Complete at 1.50m		


Remarks

Trial hole extended laterally to 5.2m x 2.5m, due to the presence of two underground storage tanks.
Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>
Grid reference estimated from <https://gridreferencefinder.com/>

Scale (approx)

1:20

Logged By

MA

Figure No.

LKC 20 1328.TP205B

Excavation Method

Mechanically Excavated Trial Pit to 2.20mbgl.

Dimensions

2.40 x 3.40 x 2.20m

Ground Level (mOD)

51.00

Client

Civic Engineers

**Job
Number**

LKC 20 1328

Location (Observed measurements)

384553 E 399000 N

Dates

23/04/2020

Engineer
Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.25-1.00	D1			50.95	0.05	MADE GROUND: Tarmacadam.		
					(0.20)	MADE GROUND: Concrete slabs with rebar and rare copper wiring.		
				50.75	0.25	MADE GROUND: Orange and dark brown gravelly slightly silty SAND with frequent whole bricks, brick and concrete fragments and rare timber. Sand is medium. Gravel is fine to coarse subangular to subrounded of mixed lithologies. Very frequent brick fragments encountered on the eastern edge of trial pit from 0.25 - 0.40mbgl. Occasional whole bricks encountered from 0.50mbgl.		
					(1.95)	Very frequent whole bricks encountered from 0.70 - 1.00mbgl.		
1.50-2.20	B3							
1.50-2.20	D2							
				48.80	2.20	Concrete slabs encountered at 2.20mbgl. Terminated at 2.20m		


Remarks

Trial hole terminated at 2.20mbgl due to concrete slabs encountered. Potential tanks assumed to not be below this depth. Trial pit was dry and stable. Grid reference estimated from <https://gridreferencefinder.com/> Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>

Scale (approx)

1:20

Logged By

MA

Figure No.

LKC 20 1328.TP206

Excavation Method

Mechanically Excavated Trial Pit to 2.30mbgl.

Dimensions

2.40 x 3.40 x 2.30m

Ground Level (mOD)

51.00

Client

Civic Engineers

**Job
Number**

LKC 20 1328

Location (Observed measurements)

384518 E 398984 N

Dates

23/04/2020

Engineer
Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20-0.50	D1			50.80	0.20	MADE GROUND: Coarse GRAVEL and concrete.		
					(2.10)	MADE GROUND: Dark brown gravelly sandy SILT with occasional brick and concrete fragments, wiring, plastic piping, clinker and rare roots. Sand is medium to coarse. Gravel is medium to coarse angular to subangular of mixed lithologies. Very sandy SILT with frequent bricks encountered between 0.30 - 0.50mbgl.		
				48.70	2.30	Terminated at 2.30m		


Remarks

Trial hole terminated at 2.30mbgl due to collapse.
Trial pit was dry.
Grid reference estimated from <https://gridreferencefinder.com/>
Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>

Scale (approx)

1:20

Logged By

MA

Figure No.

LKC 20 1328.TP207

Machine : Dando 150

Flush : Water

Core Dia : mm

Method : Rotary Cored

Casing Diameter
Ground Level (mOD)
Client

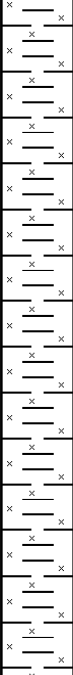
Civic Engineers

**Job
Number**
LKC 20 1328

Location
Dates

14/04/2020-
16/04/2020

Engineer
Sheet
1/2

Depth (m)	TCR	SCR	RQD	I _f	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.20-1.65					1,2/1,2,2,3 SPT N=8		0.10 (1.40)	1. MADE GROUND: Tarmacadam. 1. MADE GROUND.		
2.00-2.45					U1		1.50	1. Firm to stiff consistency brown silty CLAY.		
3.00-3.45					3,3/4,4,4,6 SPT N=18					
4.00-4.45					3,4/3,4,4,5 SPT N=16					
5.00-5.45					U2					
6.50-6.95					5,5/6,6,8,8 SPT N=28					
8.00-8.45					5,6/6,8,8,9 SPT N=31		(13.50)			
9.50-9.95					U3					
11.00-11.45					3,5/6,6,7,10 SPT N=29					
12.50-12.95					6,9/12,17,17,3 SPT N=49					
14.00-14.28					10,13/25,25 SPT 50/130					
15.00-17.23					10,15/25,25 SPT 50/2080					

Remarks

1. Drillers descriptions.
1. Drillers descriptions.

**Scale
(approx)**

1:75

**Logged
By**

HM

Figure No.

LKC 20 1328.RBH1

Machine : Dando 150

Flush : Water

Core Dia : mm

Method : Rotary Cored

Casing Diameter
Ground Level (mOD)
Client

Civic Engineers

**Job
Number**

LKC 20 1328

Location
Dates

14/04/2020-
16/04/2020

Engineer
Sheet

2/2

Depth (m)	TCR	SCR	RQD	I _f	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
17.00-17.45					10,15/12,12,13,13 SPT N=50		15.00	1. Dense red brown gravelly SAND.		
18.50-18.95					9,11/11,13,12,12 SPT N=48		(8.00)			
20.00-20.45					7,12/10,12,13,13 SPT N=48					
21.50-21.74					15,10/25,25 SPT 25*/120 50/120					
23.00-23.08					25/50 SPT 25*/30 50/50		23.00	Medium strong becoming weak thickly bedded reddish brown medium to coarse grained SANDSTONE.		
24.00					25/50 Closely to very closely spaced sub vertical to 50 degrees planar smooth open fractures with no infill.		(2.00)			
24.00-24.07	92	70	53	Av:96 Min:10 Max:240	SPT 25*/20 50/50 Very closely to medium spaced 60 degrees planar undulating open fractures with no infill.		25.00 (5.20) 25.20	Extremely weak structureless reddish brown weathered SANDSTONE recovered as SAND and GRAVEL.		
27.00					Closely to medium spaced 60 degrees to subhorizontal undulating rough to undulating planar open fractures with no infill.		(3.20)	Weak becoming medium strong thickly bedded reddish brown medium grained SANDSTONE.		
28.50	100	92	84	Av:117 Min: 20 Max: 300	Closely spaced 60 degrees undulating rough very tight to open fractures with no infill and some clay infill.		28.40 28.45 28.50	Extremely weak thinly laminated brown weathered MUDSTONE.		
								Medium strong thickly bedded reddish brown medium grained SANDSTONE.		
								Complete at 28.50m		

Remarks

Chiselling from 23.00m to 2.40m for 1.5 hours. Water added from 19.00m to 24.08m.

**Scale
(approx)**

1:75

**Logged
By**

HM

Figure No.

LKC 20 1328.RBH1

Machine : Dando 150

Flush : Water

Core Dia : mm

Method : Rotary Cored

Casing Diameter
Ground Level (mOD)
Client

Civic Engineers

**Job
Number**

LKC 20 1328

Location
Dates

14/04/2020-
16/04/2020

Engineer
Sheet

1/3

Depth (m)	TCR	SCR	RQD	I _f	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.20-1.65					1,0/0,0,1,0 SPT N=1		0.10	1. MADE GROUND: Tarmacadam. 1. MADE GROUND.		
3.00-3.45					1,0/1,1,1,0 SPT N=3		(3.40)			
5.00-5.45					U1		3.50	1. Firm to stiff consistency brown silty CLAY.		
7.00-7.45					2,3/3,3,5,5 SPT N=16					
9.00-9.45					U2		(12.00)			
11.00-11.45					5,7/10,10,11,10 SPT N=41					
13.00-13.45					U3					
15.00-17.23					8,12/11,14,14,11 SPT 50/2080					

Remarks

1. Drillers descriptions.
1. Drillers descriptions.
Water added from 15.00m to 33.50m.

**Scale
(approx)**

1:75

**Logged
By**

HM

Figure No.

LKC 20 1328.RBH1

Machine : Dando 150

Flush : Water

Core Dia : mm

Method : Rotary Cored

Casing Diameter
Ground Level (mOD)
Client

Civic Engineers

**Job
Number**

LKC 20 1328

Location
Dates

14/04/2020-
16/04/2020

Engineer
Sheet

2/3

Depth (m)	TCR	SCR	RQD	I _f	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
17.00-17.45					10,10/10,15,10,8 SPT N=43		15.50	1. Dense red brown gravelly SAND.		
19.00-19.45					8,9/11,11,14,14 SPT N=50					
21.00-21.31					10,10/25,20,5 SPT 50/160		(12.00)			
23.00-23.23					15,10/25,25 SPT 50/80					
28.00-28.10					25/50 SPT 25*/50 50/50		27.50	Medium strong becoming weak thickly bedded reddish brown medium to coarse grained SANDSTONE.		
28.50					Closely to very closely spaced sub vertical to 60 degrees planar smooth to undulating open fractures with no infill.					

Remarks

1. Drillers descriptions.
Chiselling from 27.50m to 28.50m for 1 hour. Water added from 15.00m to 33.50m.

**Scale
(approx)**

1:75

**Logged
By**

HM

Figure No.

LKC 20 1328.RBH1

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

Rochdale Road, Manchester

**Borehole
Number****CP102****Machine** : Dando 150**Flush** : Water**Core Dia** : mm**Method** : Rotary Cored**Casing Diameter****Ground Level (mOD)****Client**

Civic Engineers

**Job
Number**

LKC 20 1328

Location**Dates**14/04/2020-
16/04/2020**Engineer****Sheet**

3/3

Depth (m)	TCR	SCR	RQD	I _f	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
31.50	100	92	84	Av:122 Min:20 Max:300			(5.20)			
	100	68	77	Av:98 Min: 10 Max: 230			32.70 32.85 (0.65) 33.50	Extremely weak thinly laminated reddish brown weathered MUDSTONE. Medium strong thickly bedded reddish brown medium grained SANDSTONE. Complete at 33.50m		
33.50					Very closely to closely spaced 80 degrees planar undulating open fractures with no infill.					

Remarks**Scale
(approx)**

1:75

**Logged
By**

HM

Figure No.

LKC 20 1328.RBH1

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

Rochdale Road, Manchester

**Borehole
Number
CP103****Machine** : Dando 150**Flush** : Water**Core Dia** : mm**Method** : Rotary Cored**Casing Diameter****Ground Level (mOD)****Client**

Civic Engineers

**Job
Number
LKC 20 1328****Location****Dates**14/04/2020-
16/04/2020**Engineer****Sheet
1/3**

Depth (m)	TCR	SCR	RQD	I _f	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
2.00-2.45					2,1/2,3,3,3 SPT N=11		0.10 (2.60)	1. MADE GROUND: Tarmacadam. 1. MADE GROUND.		
4.00-4.45					U1		2.70	1. Firm to stiff consistency brown silty CLAY.		
6.00-6.45					3,3/4,4,4,5 SPT N=17					
8.00-8.45					U2					
10.00-10.45					4,6/6,9,11,14 SPT N=40		(12.30)			
12.00-12.45					U3					
14.00-14.45					10,10/11,11,14,14 SPT N=50					

Remarks1. Drillers descriptions.
1. Drillers descriptions.**Scale
(approx)**

1:75

**Logged
By**

HM

Figure No.

LKC 20 1328.RBH1

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

Rochdale Road, Manchester

**Borehole
Number****CP103****Machine** : Dando 150**Flush** : Water**Core Dia** : mm**Method** : Rotary Cored**Casing Diameter****Ground Level (mOD)****Client**

Civic Engineers

**Job
Number**

LKC 20 1328

Location**Dates**14/04/2020-
16/04/2020**Engineer****Sheet**

2/3

Depth (m)	TCR	SCR	RQD	I _f	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
16.00-16.45					10,12/10,12,12,12 SPT N=46		15.00	1. Dense red brown SAND and GRAVEL.		
18.00-18.45					8,8/10,10,11,13 SPT N=44					
20.00-20.45					9,10/10,13,12,13 SPT N=48					
22.00-22.30					10,14/25,25 SPT 50/145		(13.00)			
24.00-24.25					25/17,22,11 SPT 25*/75 50/170					
26.00-26.15					25/25,25 SPT 25*/20 50/125					
28.00-28.04					25/50 SPT 25*/20 50/20		28.00	Medium strong becoming weak reddish brown medium to coarse grained SANDSTONE. No bedding visible.		
28.50					Closely to very closely spaced sub vertical to 60 degrees planar smooth to undulating open fractures with no infill to some clay infill.		28.60 28.70 (0.80) 29.50 (0.50)	Extremely weak thinly laminated greyish brown weathered MUDSTONE. Weak to medium strong thickly bedded reddish brown medium grained SANDSTONE. Extremely weak thinly laminated greyish brown weathered	 	

Remarks1. Drillers descriptions.
Chiselling from 28.00m to 28.50m for 0.6 hours. Water added from 19.00m to 31.50m.**Scale
(approx)**

1:75

**Logged
By**

HM

Figure No.

LKC 20 1328.RBH1

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

Rochdale Road, Manchester

**Borehole
Number****CP103****Machine** : Dando 150**Flush** : Water**Core Dia** : mm**Method** : Rotary Cored**Casing Diameter****Ground Level (mOD)****Client**

Civic Engineers

**Job
Number**

LKC 20 1328

Location**Dates**14/04/2020-
16/04/2020**Engineer****Sheet**

3/3

Depth (m)	TCR	SCR	RQD	I _f	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
31.50	100	80	75	Av:183 Min:40 Max:390	Closely spaced 20-50 degrees planar undulating open fractures with no infill.		30.00	MUDSTONE. Strong reddish thickly bedded reddish brown medium grained SANDSTONE.		
							(1.50)			
							31.50	Complete at 31.50m		

Remarks**Scale
(approx)**

1:75

**Logged
By**

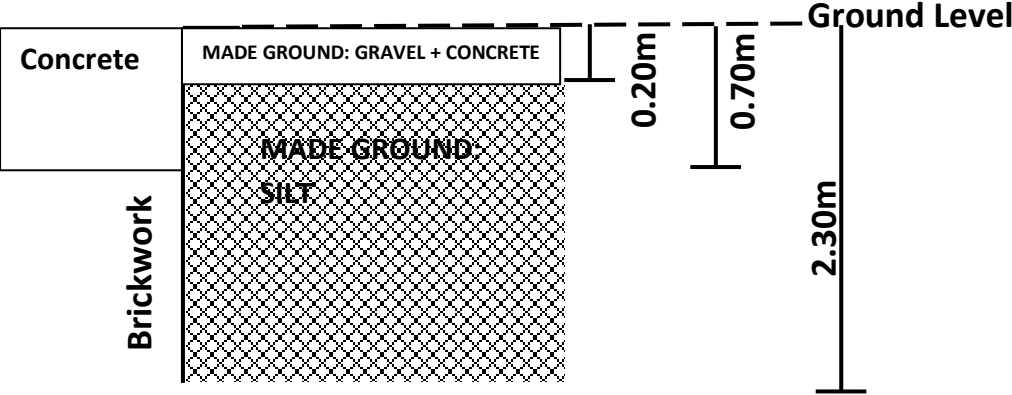
HM

Figure No.

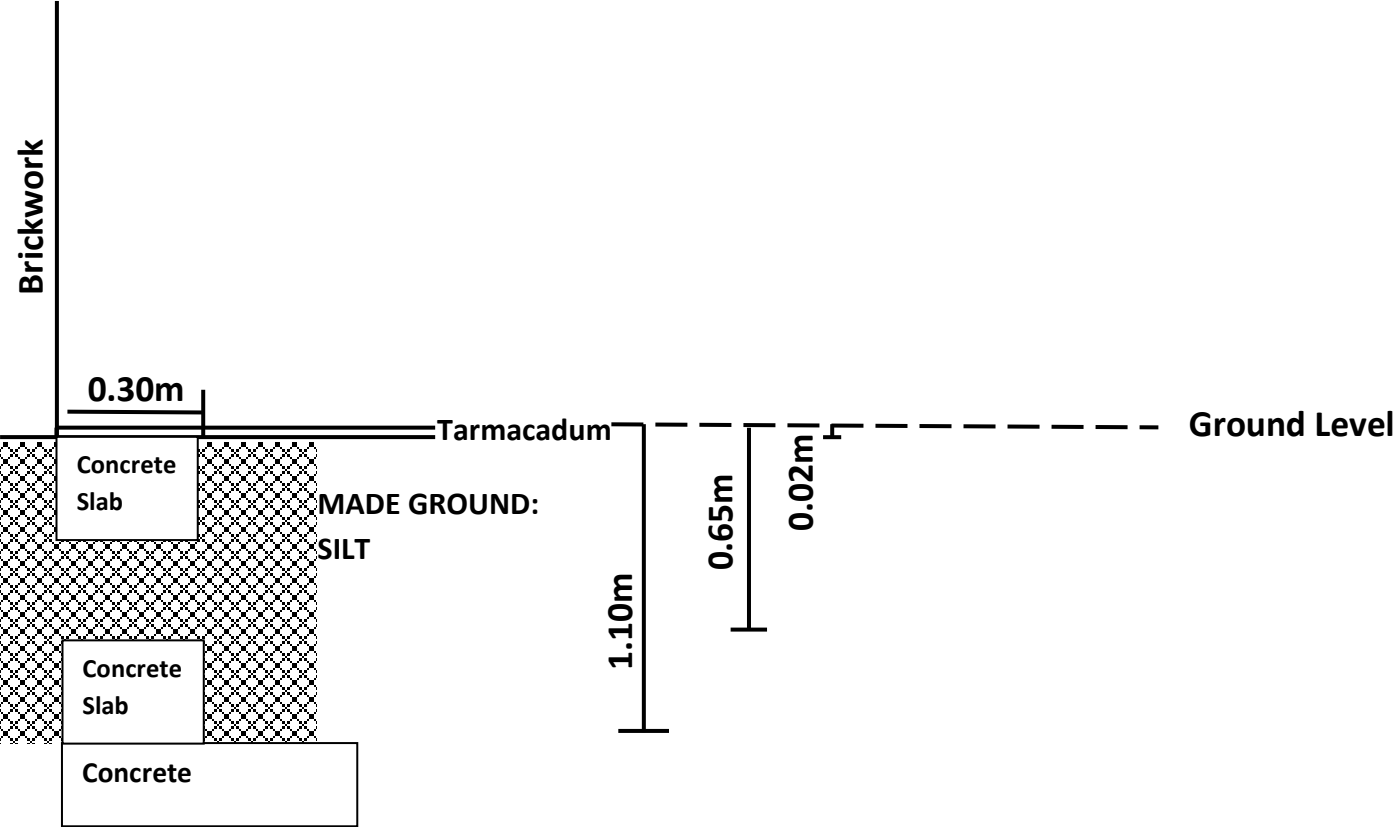
LKC 20 1328.RBH1

TP207

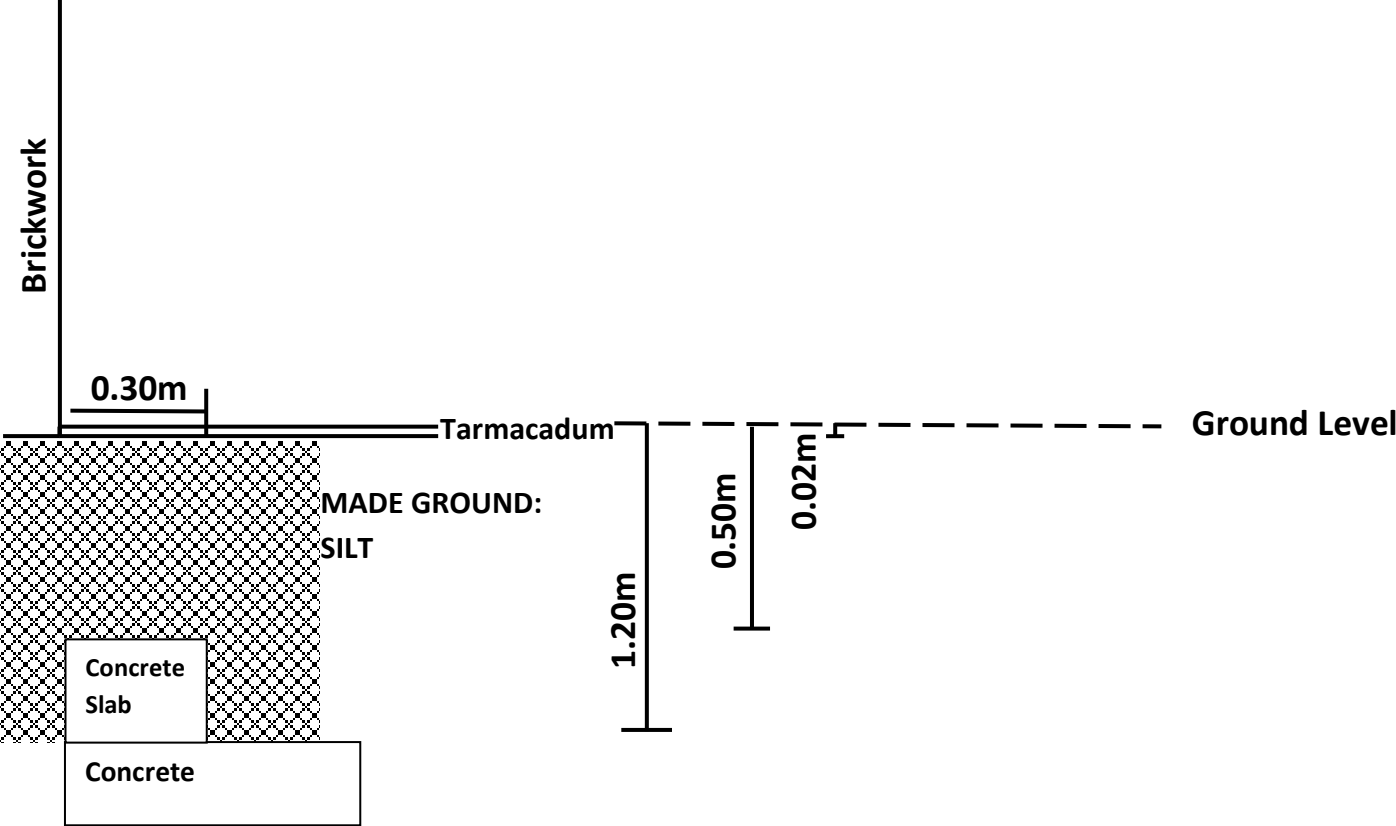
North Edge



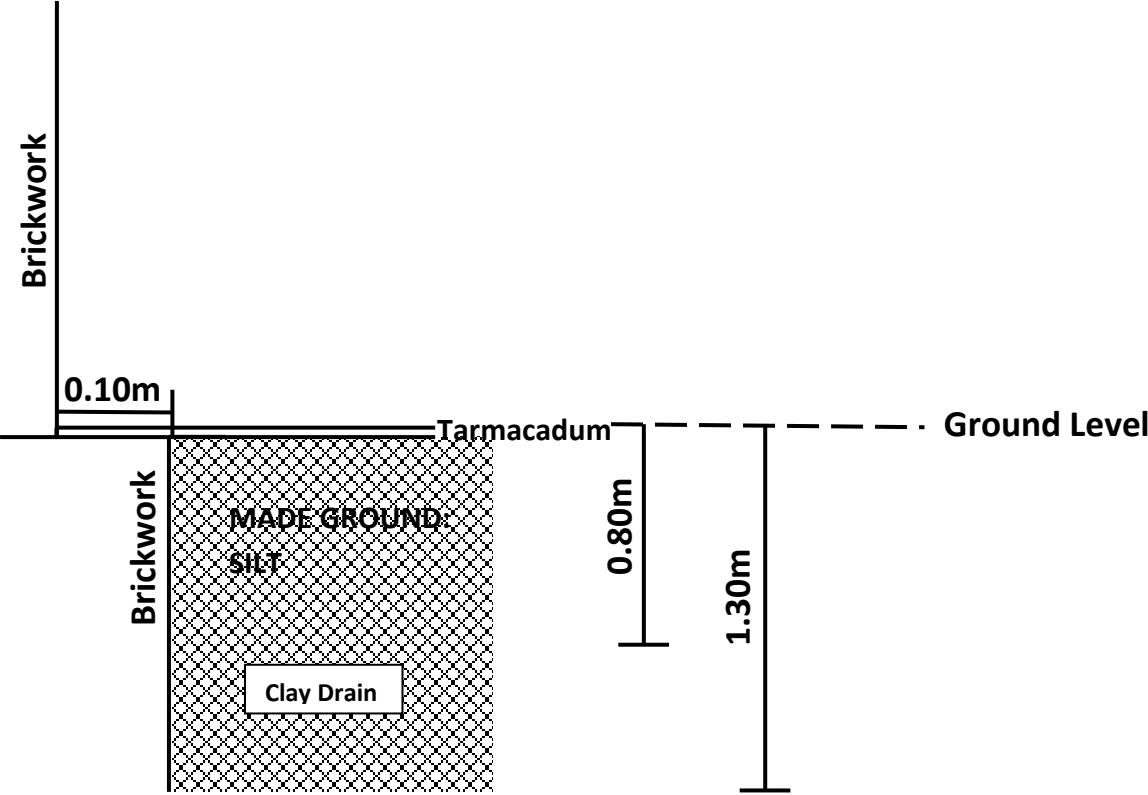
TP105



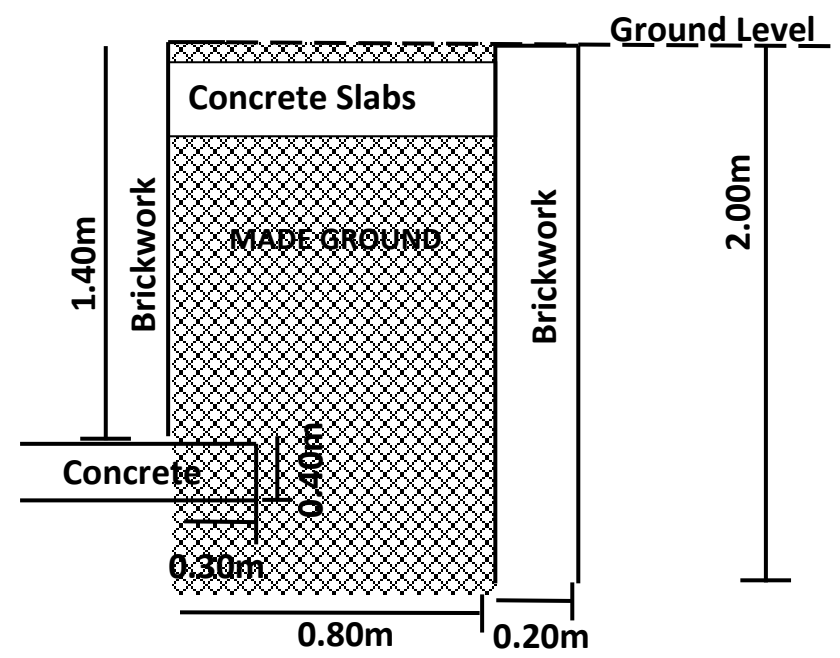
TP106



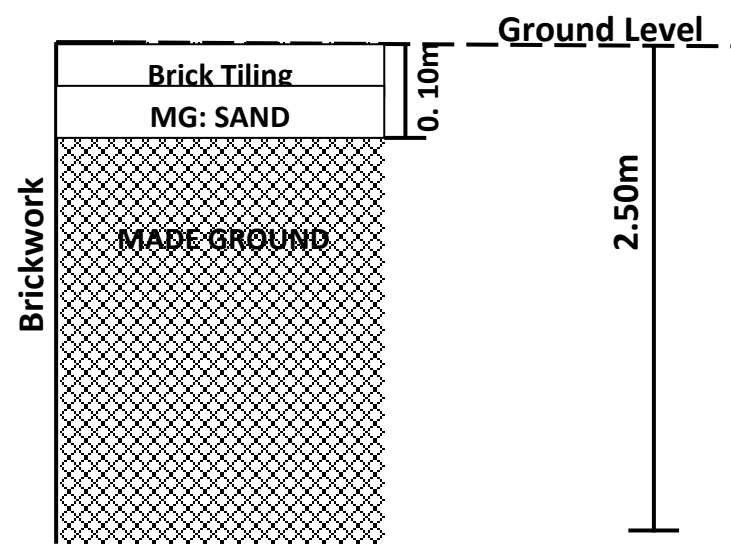
TP107



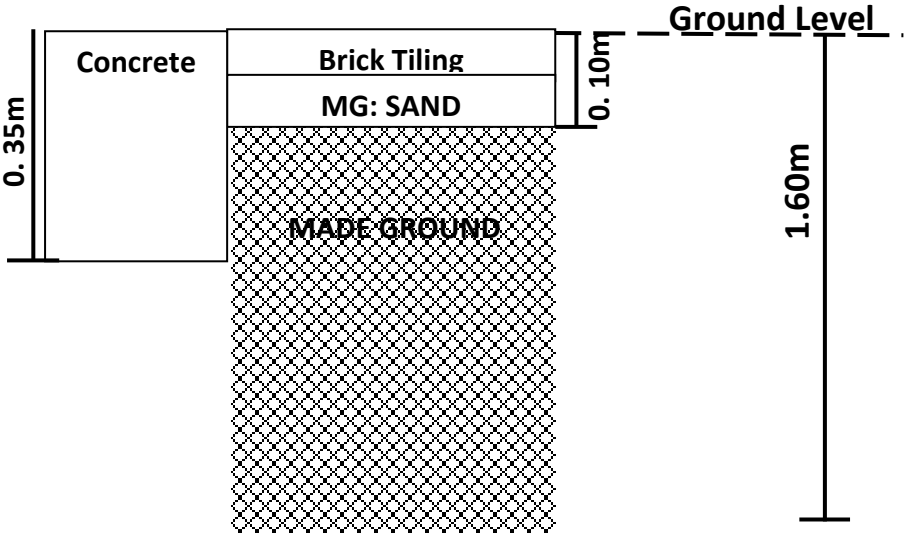
TP201B



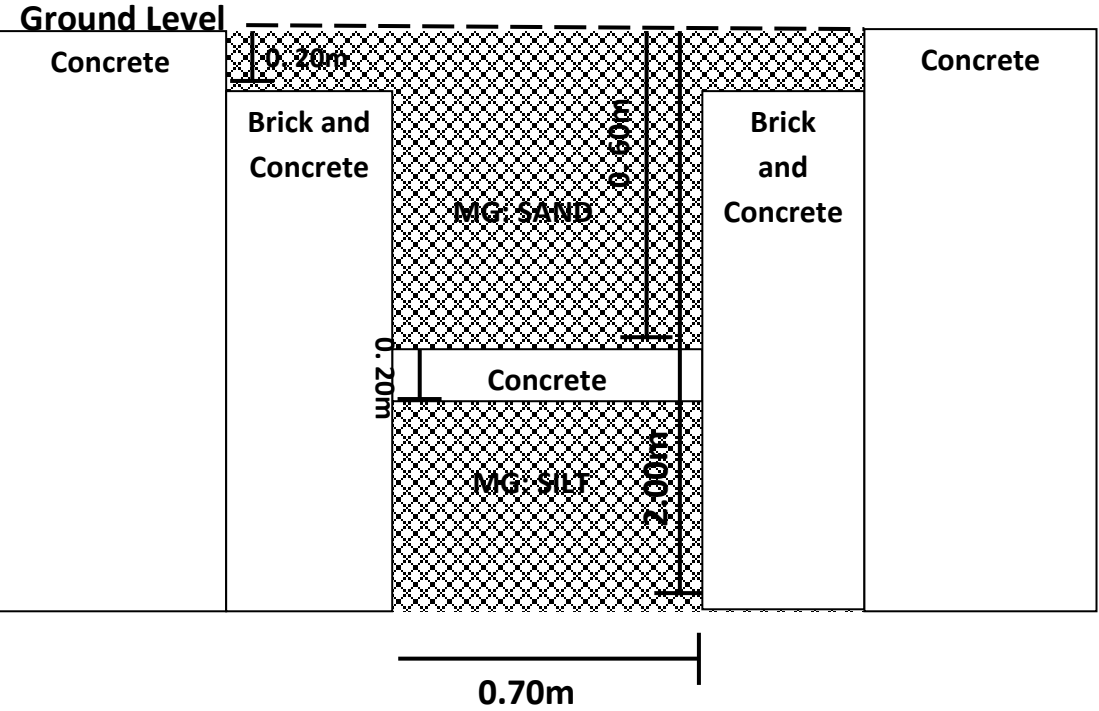
TP202



TP203



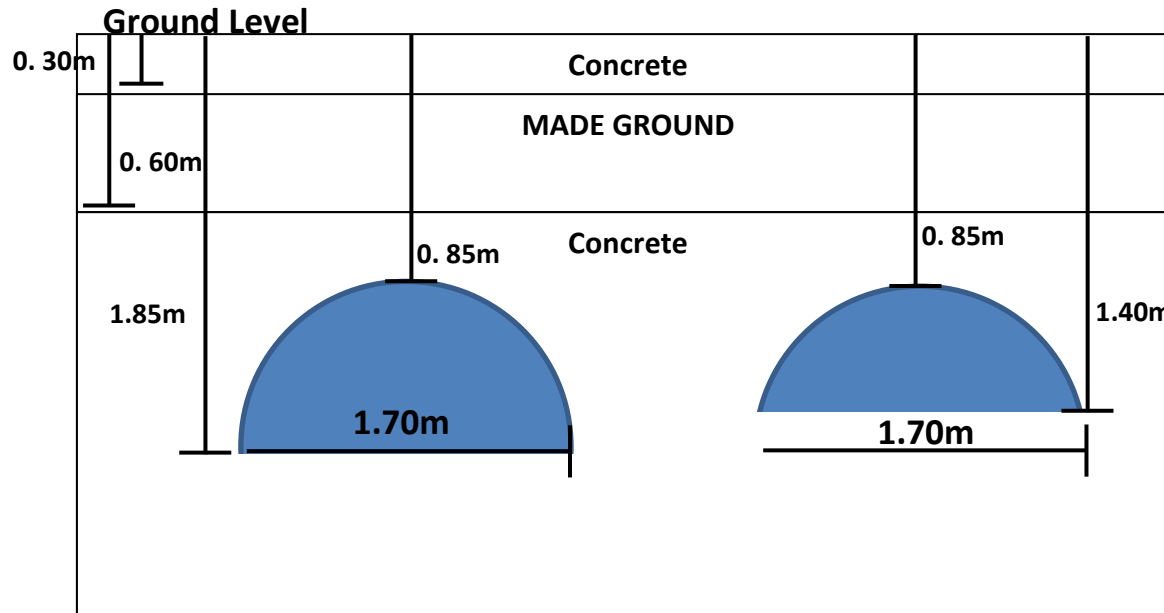
TP204



TP205b

East

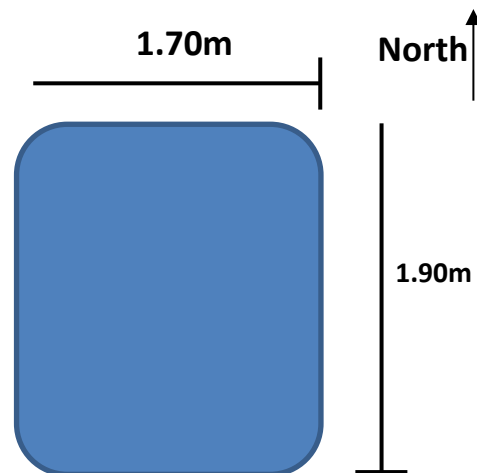
West



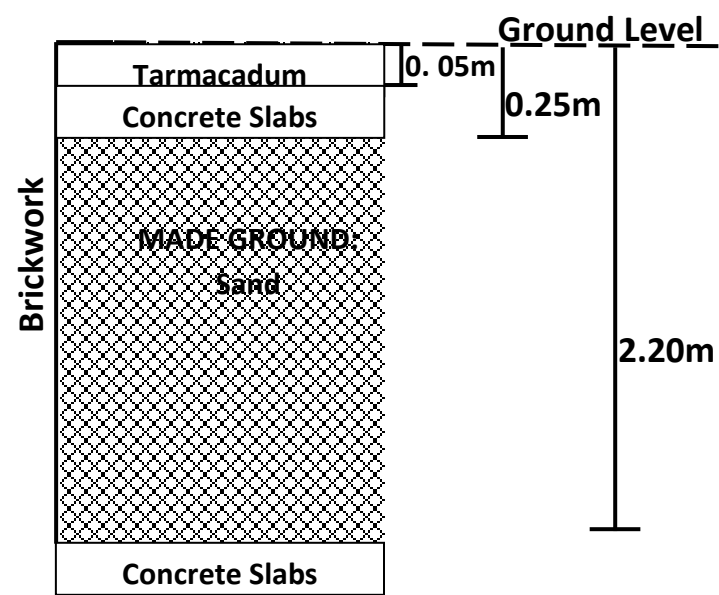
Notes on location of the tanks:

- Both tanks were 4.7m from the small wall to the south adjacent to Rochdale Road.
- Tank to the east was 21.1 m from the fence to the east.
- Tank to the west was 23.5m from the fence to the east.

Aerial View



TP206



Appendix C

Certificates of Analysis – Soil



Final Report

Report No.: 20-11054-1

Initial Date of Issue: 30-Apr-2020

Client LK Consult

Client Address: Unit 29 Eton Business Park
Eton Hill Road
Radcliffe
Manchester
Lancashire
M26 2ZS

Contact(s): Chris Hughes
Contaminated Land

Project LKC 20 1328 - Rochdale Rd,
Manchester

Quotation No.: **Date Received:** 24-Apr-2020

Order No.: 737717 **Date Instructed:** 27-Apr-2020

No. of Samples: 4

Turnaround (Wkdays): 5 **Results Due:** 01-May-2020

Date Approved: 30-Apr-2020

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Client: LK Consult	Chemtest Job No.:				20-11054	20-11054	20-11054	20-11054
Quotation No.:	Chemtest Sample ID.:				999230	999231	999232	999233
	Client Sample ID.:				TP205B	TP206	TP206	TP207
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.85	0.25	1.50	0.20
	Bottom Depth (m):				1.40	1.00	2.20	0.50
	Date Sampled:				23-Apr-2020	23-Apr-2020	23-Apr-2020	23-Apr-2020
	Asbestos Lab:				LIVERPOOL	LIVERPOOL	LIVERPOOL	LIVERPOOL
Determinand	Accred.	SOP	Units	LOD				
ACM Type	U	2192		N/A	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-	-
Moisture	N	2030	%	0.020	6.5	13	14	5.1
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand
pH	M	2010		4.0		10.9		9.6
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010		0.090		0.15
Arsenic	M	2450	mg/kg	1.0		15		17
Cadmium	M	2450	mg/kg	0.10		0.50		0.45
Chromium	M	2450	mg/kg	1.0		30		32
Copper	M	2450	mg/kg	0.50		37		180
Mercury	M	2450	mg/kg	0.10		0.22		0.20
Nickel	M	2450	mg/kg	0.50		20		20
Lead	M	2450	mg/kg	0.50		190		120
Selenium	M	2450	mg/kg	0.20		< 0.20		< 0.20
Vanadium	U	2450	mg/kg	5.0		24		23
Zinc	M	2450	mg/kg	0.50		65		84
Chromium (Hexavalent)	N	2490	mg/kg	0.50		< 0.50		< 0.50
Organic Matter	M	2625	%	0.40	2.1	3.8	4.3	8.8
Fuel Type	N	2670		N/A	n/a		n/a	
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0		< 1.0	
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0		< 1.0	
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0		< 1.0	
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0		< 1.0	
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0		< 1.0	
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0		< 1.0	
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0		< 1.0	
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0		< 1.0	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0		< 5.0	
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0		< 1.0	
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0		< 1.0	
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0		< 1.0	
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0		< 1.0	
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0		< 1.0	
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0		< 1.0	

Results - Soil

Client: LK Consult	Chemtest Job No.:				20-11054	20-11054	20-11054	20-11054
Quotation No.:	Chemtest Sample ID.:				999230	999231	999232	999233
	Client Sample ID.:				TP205B	TP206	TP206	TP207
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.85	0.25	1.50	0.20
	Bottom Depth (m):				1.40	1.00	2.20	0.50
	Date Sampled:				23-Apr-2020	23-Apr-2020	23-Apr-2020	23-Apr-2020
	Asbestos Lab:				LIVERPOOL	LIVERPOOL	LIVERPOOL	LIVERPOOL
Determinand	Accred.	SOP	Units	LOD				
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0		< 1.0	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0		< 1.0	
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0		< 5.0	
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10		< 10	
Benzene	M	2760	µg/kg	1.0	< 1.0		< 1.0	
Toluene	M	2760	µg/kg	1.0	1.8		< 1.0	
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0		< 1.0	
m & p-Xylene	M	2760	µg/kg	1.0	4.1		< 1.0	
o-Xylene	M	2760	µg/kg	1.0	3.1		< 1.0	
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0		< 1.0	
Naphthalene	M	2800	mg/kg	0.10		0.42		0.48
Acenaphthylene	N	2800	mg/kg	0.10		< 0.10		0.30
Acenaphthene	M	2800	mg/kg	0.10		< 0.10		1.9
Fluorene	M	2800	mg/kg	0.10		0.10		1.6
Phenanthrene	M	2800	mg/kg	0.10		0.86		17
Anthracene	M	2800	mg/kg	0.10		0.19		5.1
Fluoranthene	M	2800	mg/kg	0.10		1.3		28
Pyrene	M	2800	mg/kg	0.10		1.1		23
Benzo[a]anthracene	M	2800	mg/kg	0.10		0.51		12
Chrysene	M	2800	mg/kg	0.10		0.41		8.8
Benzo[b]fluoranthene	M	2800	mg/kg	0.10		0.51		14
Benzo[k]fluoranthene	M	2800	mg/kg	0.10		0.22		4.8
Benzo[a]pyrene	M	2800	mg/kg	0.10		0.49		13
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10		0.43		8.8
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10		< 0.10		1.5
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10		0.54		7.7
Total Of 16 PAH's	N	2800	mg/kg	2.0		7.1		150

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

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

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

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

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 20-10235-1
Initial Date of Issue: 16-Apr-2020
Client LK Consult
Client Address: Unit 29 Eton Business Park
Eton Hill Road
Radcliffe
Manchester
Lancashire
M26 2ZS
Contact(s): Chris Hughes
Contaminated Land
Project LKC 20 1328 Rochdale Rd,
Manchester

Quotation No.:		Date Received:	08-Apr-2020
Order No.:	737717	Date Instructed:	08-Apr-2020
No. of Samples:	8		
Turnaround (Wkdays):	5	Results Due:	16-Apr-2020
Date Approved:	16-Apr-2020		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Client: LK Consult	Chemtest Job No.:				20-10235	20-10235	20-10235	20-10235	20-10235	20-10235	20-10235	20-10235
Quotation No.:	Chemtest Sample ID.:				996046	996048	996049	996051	996052	996054	996055	996056
	Client Sample ID.:				WS101 D1	WS101 D3	WS102 D1	WS102 D3	WS103 D1	TP105 D1	TP106 D1	TP107 D1
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.2	2.5	0.2	2.6	0.1	0.3	0.2	0.0
	Bottom Depth (m):				0.5	3.0	0.6	3.0	0.5	0.6	0.5	0.5
	Date Sampled:				06-Apr-2020	06-Apr-2020	06-Apr-2020	06-Apr-2020	06-Apr-2020	06-Apr-2020	06-Apr-2020	06-Apr-2020
	Asbestos Lab:				COVENTRY		COVENTRY		COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD								
ACM Type	U	2192		N/A	-		bitumen		-	-	Fibres/Clumps	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected		Chrysotile		No Asbestos Detected	No Asbestos Detected	Chrysotile	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-		Stereo Microscopy		-	-	Stereo Microscopy	-
Asbestos by Gravimetry	U	2192	%	0.001			0.006				0.001	
Total Asbestos	N	2192	%	0.001			0.006				0.001	
Moisture	N	2030	%	0.020	6.0	17	14	16	7.4	12	14	16
Soil Colour	N	2040		N/A	Brown,	Brown	Brown,	Brown,	Brown,	Brown,	Brown,	Brown,
Other Material	N	2040		N/A	Stones, Brick,	Stones	Stones, Brick,	NONE,	Stones, Brick,	Stones,	Stones,	Stones,
Soil Texture	N	2040		N/A	Sand,	Clay	Sand,	Clay,	Sand,	Sand,	Sand,	Sand,
Chromatogram (TPH)	N			N/A					See Attached			
pH	M	2010		4.0	8.8	8.2	9.3	8.0	8.5	8.3	8.7	8.2
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40					0.47			
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	< 0.010	0.13	0.27	0.076	0.013	0.011	0.15	0.033
Cyanide (Free)	M	2300	mg/kg	0.50					< 0.50			
Cyanide (Total)	M	2300	mg/kg	0.50					< 0.50			
Arsenic	M	2450	mg/kg	1.0	4.1		14		21	48	23	28
Cadmium	M	2450	mg/kg	0.10	0.21		0.89		0.38	< 0.10	< 0.10	1.3
Chromium	M	2450	mg/kg	1.0	11		17		17	25	24	28
Copper	M	2450	mg/kg	0.50	11		67		47	9600	260	610
Mercury	M	2450	mg/kg	0.10	< 0.10		0.39		0.40	0.41	0.90	0.79
Nickel	M	2450	mg/kg	0.50	12		24		23	55	28	49
Lead	M	2450	mg/kg	0.50	25		260		140	9000	800	390
Selenium	M	2450	mg/kg	0.20	< 0.20		< 0.20		< 0.20	0.77	0.21	0.45
Vanadium	U	2450	mg/kg	5.0	12		32		23	29	31	42
Zinc	M	2450	mg/kg	0.50	37		120		69	750	370	700
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50		< 0.50		< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	M	2625	%	0.40	2.8		8.8		4.0	6.7	5.5	13
Fuel Type	N	2670		N/A					PAH			
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0					< 1.0			
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0					< 1.0			
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0					< 1.0			
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0					< 1.0			
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0					3.5			
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0					21			
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0					38			
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0					100			

Results - Soil

Client: LK Consult	Chemtest Job No.:				20-10235	20-10235	20-10235	20-10235	20-10235	20-10235	20-10235	20-10235
Quotation No.:	Chemtest Sample ID.:				996046	996048	996049	996051	996052	996054	996055	996056
	Client Sample ID.:				WS101 D1	WS101 D3	WS102 D1	WS102 D3	WS103 D1	TP105 D1	TP106 D1	TP107 D1
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.2	2.5	0.2	2.6	0.1	0.3	0.2	0.0
	Bottom Depth (m):				0.5	3.0	0.6	3.0	0.5	0.6	0.5	0.5
	Date Sampled:				06-Apr-2020	06-Apr-2020	06-Apr-2020	06-Apr-2020	06-Apr-2020	06-Apr-2020	06-Apr-2020	06-Apr-2020
	Asbestos Lab:				COVENTRY		COVENTRY		COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD								
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0					160			
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0					< 1.0			
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0					< 1.0			
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0					< 1.0			
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0					< 1.0			
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0					3.6			
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0					140			
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0					780			
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0					3600			
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0					4500			
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0					4700			
Benzene	M	2760	µg/kg	1.0					< 1.0			
Toluene	M	2760	µg/kg	1.0					< 1.0			
Ethylbenzene	M	2760	µg/kg	1.0					< 1.0			
m & p-Xylene	M	2760	µg/kg	1.0					< 1.0			
o-Xylene	M	2760	µg/kg	1.0					< 1.0			
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0					< 1.0			
Naphthalene	M	2800	mg/kg	0.10	0.25		1.6		1.7	3.6	1.0	1.6
Acenaphthylene	N	2800	mg/kg	0.10	0.14		0.46		0.76	0.66	0.23	0.46
Acenaphthene	M	2800	mg/kg	0.10	0.63		1.7		8.0	4.7	0.97	0.77
Fluorene	M	2800	mg/kg	0.10	0.57		1.1		8.2	2.1	0.72	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	6.0		12		99	24	7.9	7.3
Anthracene	M	2800	mg/kg	0.10	1.5		3.0		28	6.7	2.2	1.7
Fluoranthene	M	2800	mg/kg	0.10	9.6		19		120	34	13	15
Pyrene	M	2800	mg/kg	0.10	7.6		17		93	26	11	12
Benzo[a]anthracene	M	2800	mg/kg	0.10	3.7		8.3		45	13	5.8	9.2
Chrysene	M	2800	mg/kg	0.10	3.6		8.4		41	12	6.0	9.4
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	5.0		11		49	16	7.9	18
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	1.9		4.0		18	4.8	2.9	6.1
Benzo[a]pyrene	M	2800	mg/kg	0.10	4.6		8.9		44	12	6.6	13
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	2.9		6.4		220	9.2	4.7	10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.46		0.84		4.8	2.2	0.67	2.7
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	2.9		6.2		22	9.5	4.8	8.3
Total Of 16 PAH's	N	2800	mg/kg	2.0	51		110		800	180	77	110
Total Phenols	M	2920	mg/kg	0.30					< 0.30			

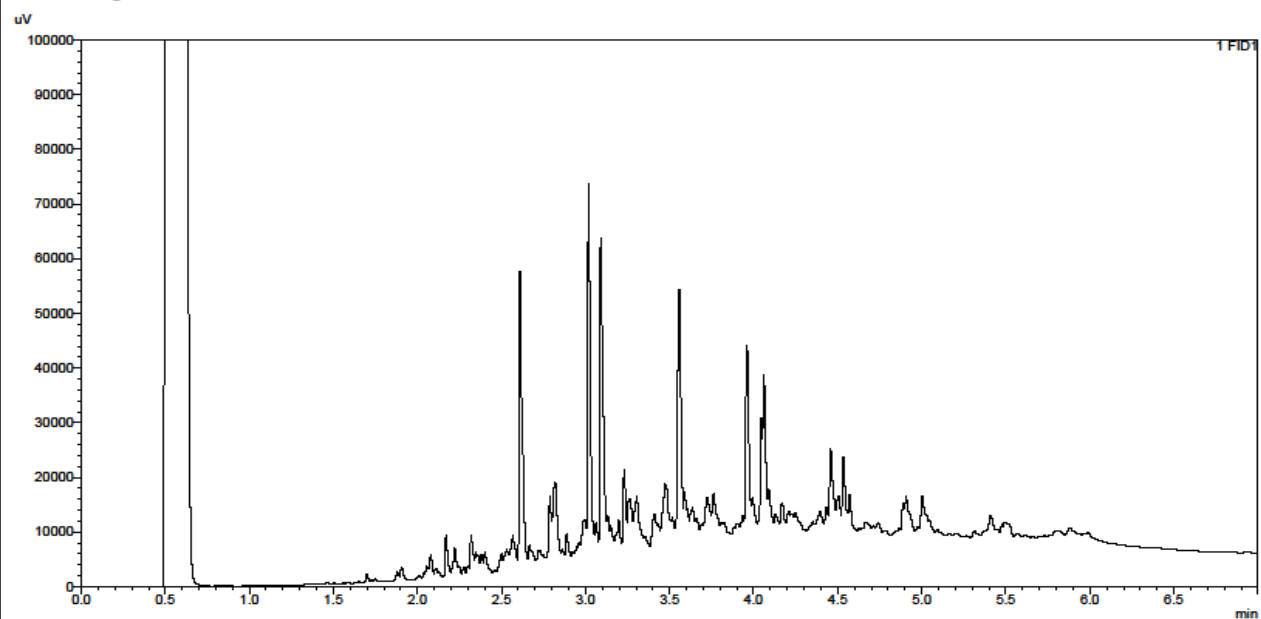
TPH Chromatogram on Soil Sample: 996052

<Sample Information>

Sample Name : 996052 20-10235
Data Filename : 14 April 2020_14042020_996052 20-10235_027.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 14
Date Acquired : 14/04/2020 17:20:43
Date Processed : 14/04/2020



<Chromatogram>



SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

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

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

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

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 20-10681-1

Initial Date of Issue: 24-Apr-2020

Client LK Consult

Client Address: Unit 29 Eton Business Park
Eton Hill Road
Radcliffe
Manchester
Lancashire
M26 2ZS

Contact(s): Chris Hughes
Contaminated Land

Project LKC 20 1328 Rochdale Rd,
Manchester

Quotation No.:		Date Received:	20-Apr-2020
Order No.:	737717	Date Instructed:	20-Apr-2020
No. of Samples:	6		
Turnaround (Wkdays):	5	Results Due:	24-Apr-2020
Date Approved:	24-Apr-2020		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Client: LK Consult	Chemtest Job No.:				20-10681	20-10681	20-10681	20-10681	20-10681	20-10681
Quotation No.:	Chemtest Sample ID.:				997787	997788	997789	997791	997792	997793
	Client Sample ID.:				TP101 D1	TP102 D1	TP103 D1	TP104 D2	TP104 D4	TP105 D1
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.10	0.30	0.30	0.55	1.00	0.20
	Bottom Depth (m):				1.00	1.00	0.90	0.60	2.00	0.50
	Date Sampled:				16-Apr-2020	16-Apr-2020	16-Apr-2020	16-Apr-2020	16-Apr-2020	16-Apr-2020
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD						
ACM Type	U	2192		N/A	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-	-	-	-
Moisture	N	2030	%	0.020	12	11	14	14	15	10
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones	Stones	Stones and Brick
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand	Sand	Sand
Chromatogram (TPH)	N			N/A				See Attached		
pH	M	2010		4.0	9.6	9.1	8.5	7.6		11.8
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40				< 0.40		
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.10	0.085	0.030	0.16		0.12
Cyanide (Free)	M	2300	mg/kg	0.50				< 0.50		
Cyanide (Total)	M	2300	mg/kg	0.50				< 0.50		
Arsenic	M	2450	mg/kg	1.0	15	20	44	3.1		13
Cadmium	M	2450	mg/kg	0.10	0.77	0.57	5.4	< 0.10		0.14
Chromium	M	2450	mg/kg	1.0	16	17	19	4.3		12
Copper	M	2450	mg/kg	0.50	110	51	85	7.4		30
Mercury	M	2450	mg/kg	0.10	0.39	0.68	4.9	< 0.10		0.10
Nickel	M	2450	mg/kg	0.50	27	23	36	6.8		16
Lead	M	2450	mg/kg	0.50	190	190	520	7.5		30
Selenium	M	2450	mg/kg	0.20	< 0.20	< 0.20	1.2	< 0.20		< 0.20
Vanadium	U	2450	mg/kg	5.0	23	26	29	7.3		19
Zinc	M	2450	mg/kg	0.50	200	110	150	19		37
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50		< 0.50
Organic Matter	M	2625	%	0.40	7.6	8.8	45	1.9	4.1	6.2
Fuel Type	N	2670		N/A				W.Diesel	PAH	
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0				< 1.0	< 1.0	
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0				< 1.0	< 1.0	
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0				100	< 1.0	
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0				570	< 1.0	
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0				2900	< 1.0	
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0				4000	14	
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0				1200	150	
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0				< 1.0	< 1.0	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0				8900	160	
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0				< 1.0	< 1.0	

Results - Soil

Client: LK Consult	Chemtest Job No.:				20-10681	20-10681	20-10681	20-10681	20-10681	20-10681
Quotation No.:	Chemtest Sample ID.:				997787	997788	997789	997791	997792	997793
	Client Sample ID.:				TP101 D1	TP102 D1	TP103 D1	TP104 D2	TP104 D4	TP105 D1
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.10	0.30	0.30	0.55	1.00	0.20
	Bottom Depth (m):				1.00	1.00	0.90	0.60	2.00	0.50
	Date Sampled:				16-Apr-2020	16-Apr-2020	16-Apr-2020	16-Apr-2020	16-Apr-2020	16-Apr-2020
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD						
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0				< 1.0	< 1.0	
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0				< 1.0	< 1.0	
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0				140	< 1.0	
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0				1400	< 1.0	
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0				1000	9.6	
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0				240	130	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0				< 1.0	< 1.0	
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0				2900	140	
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0				12000	300	
Benzene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
Toluene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
Ethylbenzene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
m & p-Xylene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
o-Xylene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0				< 1.0	< 1.0	
Naphthalene	M	2800	mg/kg	0.10	0.40	0.52	0.20	< 0.10		0.13
Acenaphthylene	N	2800	mg/kg	0.10	0.13	0.12	0.22	< 0.10		< 0.10
Acenaphthene	M	2800	mg/kg	0.10	0.45	0.29	0.33	< 0.10		< 0.10
Fluorene	M	2800	mg/kg	0.10	0.24	0.22	0.26	< 0.10		< 0.10
Phenanthrene	M	2800	mg/kg	0.10	2.6	2.0	4.3	1.9		0.58
Anthracene	M	2800	mg/kg	0.10	0.88	0.65	0.63	0.87		0.19
Fluoranthene	M	2800	mg/kg	0.10	4.5	4.0	3.0	0.14		0.77
Pyrene	M	2800	mg/kg	0.10	4.1	3.5	2.5	0.24		0.84
Benzo[a]anthracene	M	2800	mg/kg	0.10	2.0	2.2	1.5	< 0.10		0.40
Chrysene	M	2800	mg/kg	0.10	1.9	2.1	1.4	< 0.10		0.34
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	3.0	2.9	1.7	< 0.10		0.26
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	0.90	1.0	0.48	< 0.10		0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10	2.5	2.6	1.4	< 0.10		0.21
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	1.9	1.5	0.79	< 0.10		0.22
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.35	0.23	0.14	< 0.10		< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	1.5	1.4	0.77	< 0.10		0.21
Total Of 16 PAH's	N	2800	mg/kg	2.0	27	25	20	3.1		4.4
Total Phenols	M	2920	mg/kg	0.30				< 0.30		

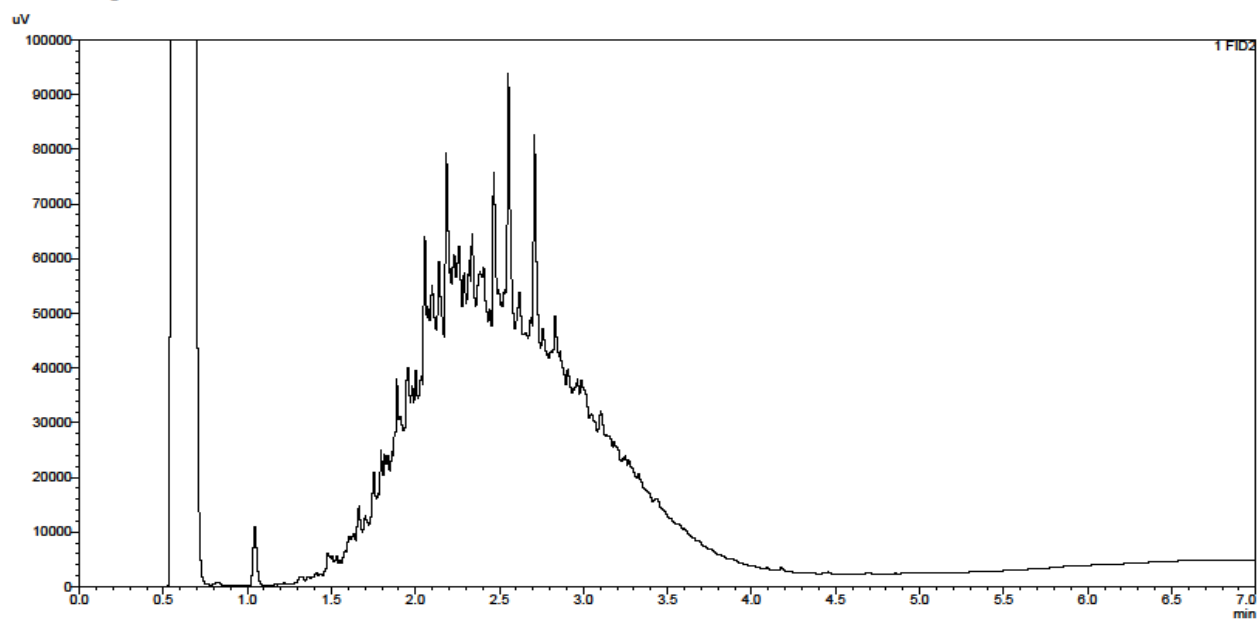
TPH Chromatogram on Soil Sample: 997791

<Sample Information>

Sample Name : 997791 20-10681
Data Filename : 20 April 2020_20042020_997791 20-10681_108.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 129
Date Acquired : 21/04/2020 02:56:09
Date Processed : 21/04/2020



<Chromatogram>



SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
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- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

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

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

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

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

Appendix D

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 20 1328 –
Rochdale Road, Manchester

Job Number MRN 3816/52
Date of Issue 13 May 2020
Page 1 of 9

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. This does not, however, guarantee the balance of the materials from which the tested samples have been taken to be of equal quality.



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

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MURRAY RIX

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

TEST CERTIFICATE
DETERMINATION OF THE COMPRESSIVE STRENGTH OF INTACT ROCK CORE
SPECIMENS
ASTM D7012 – 14 Method C

Client LK Consult Ltd
Address Unit 29 Eton Business Park
Eton Hill Road
Radcliffe
Greater Manchester
M26 2ZS

Site LKC 20 1328 – Rochdale Road, Manchester

Job No. MRN 816/52

Laboratory Sample Number 89282

Site Reference Number BH1 24-27m - A

Date of Receipt 05 May 2020

Date of Test 11 May 2020

Dimensions

Tested by	MW	Diameter	85.0 mm
Length after preparation	171 mm	Length/diameter ratio	2.01

Method of End Preparation Saw/Grinding

Time in Water prior to test 0 hours

Material	Rock Core	Site Mark	BH1 24-27m
Sample Location	Not advised	Tested By	MW

Date of Drilling Not advised

Drilled by Others

Description of core after test	Split vertically from top to bottom, with no visible end effects
--------------------------------	--

Compressive Strength

Load at Failure	kN	113.9	Measured Compressive Strength	N/mm ²	20.1
-----------------	----	-------	-------------------------------	-------------------	------

Compressive Strength 20.1 MPa

Comments/Deviations from standard method/Abnormalities noted during visual inspection.

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

Signature 

Date 13 May 2020

MURRAY RIX

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

TEST CERTIFICATE
DETERMINATION OF THE COMPRESSIVE STRENGTH OF INTACT ROCK CORE
SPECIMENS
ASTM D7012 – 14 Method C

Client
Address

LK Consult Ltd
Unit 29 Eton Business Park
Eton Hill Road
Radcliffe
Greater Manchester
M26 2ZS

Site

LKC 20 1328 – Rochdale Road, Manchester

Job No. MRN 816/52

Laboratory Sample Number 89283

Site Reference Number

BH1 24-27m - B

Date of Receipt 05 May 2020

Date of Test 11 May 2020

Dimensions

Tested by	MW	Diameter	85.0 mm
Length after preparation	170 mm	Length/diameter ratio	2.00

Method of End Preparation Saw/Grinding

Time in Water prior to test 0 hours

Material	Rock Core	Site Mark	BH1 24-27m
Sample Location	Not advised	Tested By	MW

Date of Drilling Not advised

Drilled by Others

Description of core after test	Split vertically from top to bottom, with no visible end effects
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Compressive Strength

Load at Failure	kN	107.1	Measured Compressive Strength	N/mm ²	18.9
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Compressive Strength 18.9 MPa

Comments/Deviations from standard method/Abnormalities noted during visual inspection.

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

Signature



Date 13 May 2020

MURRAY RIX

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

TEST CERTIFICATE

DETERMINATION OF POINT LOAD STRENGTH INDEX OF ROCK
METHOD IN ACCORDANCE WITH ASTM STANDARD D 5731

CLIENT	LK Consult Ltd
SITE	LKC 20 1328 - Rochdale Road, Manchester
JOB NUMBER	MRN 3816/52

SAMPLE LABEL	BH1 24-27m	DATE SAMPLED	Not advised
LAB SAMPLE No	89284	DATE RECEIVED	05-May-20
DATE TESTED	11-May-20	SAMPLED BY	Client

MATERIAL	Rock Core
ADVISED SOURCE	Site Investigation Sample

Sample Number	Test Type	D (mm)	*W (mm)	Load (P) (kN)	D_e^2 (mm ²)	D_e (mm)	I_s (MPa)	F	$I_{s(50)}$ (MPa)
1	D	85.0		1	7225.00	85.00	0.14	1.27	0.18
2	D	85.0		1.3	7225.00	85.00	0.18	1.27	0.23
3	D	85.0		0.9	7225.00	85.00	0.12	1.27	0.16
4	D	85.0		1.0	7225.00	85.00	0.14	1.27	0.18
5	D	85.0		0.4	7225.00	85.00	0.06	1.27	0.07
6	D	85.0		0.8	7225.00	85.00	0.11	1.27	0.14
7	D	85.0		1.9	7225.00	85.00	0.26	1.27	0.33
8	D	85.0		1.7	7225.00	85.00	0.24	1.27	0.30
9	D	85.0		0.6	7225.00	85.00	0.08	1.27	0.11
10	D	85.0		1.8	7225.00	85.00	0.25	1.27	0.32
11					0.00	0.00	0.00	0.00	0.00
12					0.00	0.00	0.00	0.00	0.00
13					0.00	0.00	0.00	0.00	0.00
14					0.00	0.00	0.00	0.00	0.00
15					0.00	0.00	0.00	0.00	0.00
16					0.00	0.00	0.00	0.00	0.00
17					0.00	0.00	0.00	0.00	0.00
18					0.00	0.00	0.00	0.00	0.00
19					0.00	0.00	0.00	0.00	0.00
20					0.00	0.00	0.00	0.00	0.00

*W Entry required if test type is not Diametrical

REMARKS

SIGNED

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

DATE 13-May-20

MURRAY RIX

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

TEST CERTIFICATE
DETERMINATION OF THE COMPRESSIVE STRENGTH OF INTACT ROCK CORE
SPECIMENS
ASTM D7012 – 14 Method C

Client LK Consult Ltd
Address Unit 29 Eton Business Park
Eton Hill Road
Radcliffe
Greater Manchester
M26 2ZS

Site LKC 20 1328 – Rochdale Road, Manchester

Job No. MRN 816/52

Laboratory Sample Number 89285

Site Reference Number BH2 30-33m - A

Date of Receipt 05 May 2020

Date of Test 11 May 2020

Dimensions

Tested by	MW	Diameter	85.0 mm
Length after preparation	171 mm	Length/diameter ratio	2.01

Method of End Preparation Saw/Grinding

Time in Water prior to test 0 hours

Material	Rock Core	Site Mark	BH2 30-33m
Sample Location	Not advised	Tested By	MW

Date of Drilling Not advised

Drilled by Others

Description of core after test	Split vertically from top to bottom, with no visible end effects
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Compressive Strength

Load at Failure	kN	43.0	Measured Compressive Strength	N/mm ²	7.6
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Compressive Strength 7.6 MPa

Comments/Deviations from standard method/Abnormalities noted during visual inspection.

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

Signature 

Date 13 May 2020

MURRAY RIX

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

TEST CERTIFICATE
DETERMINATION OF THE COMPRESSIVE STRENGTH OF INTACT ROCK CORE
SPECIMENS
ASTM D7012 – 14 Method C

Client
Address

LK Consult Ltd
Unit 29 Eton Business Park
Eton Hill Road
Radcliffe
Greater Manchester
M26 2ZS

Site LKC 20 1328 – Rochdale Road, Manchester

Job No. MRN 816/52

Laboratory Sample Number 89286

Site Reference Number BH2 30-33m - B

Date of Receipt 05 May 2020

Date of Test 11 May 2020

Dimensions

Tested by	MW	Diameter	85.0 mm
Length after preparation	171 mm	Length/diameter ratio	2.01

Method of End Preparation Saw/Grinding

Time in Water prior to test 0 hours

Material	Rock Core	Site Mark	BH2 30-33m
Sample Location	Not advised	Tested By	MW

Date of Drilling Not advised

Drilled by Others

Description of core after test	Split vertically from top to bottom, with no visible end effects
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Compressive Strength

Load at Failure	kN	50.7	Measured Compressive Strength	N/mm ²	8.9
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Compressive Strength 8.9 MPa

Comments/Deviations from standard method/Abnormalities noted during visual inspection.

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

Signature 

Date 13 May 2020

MURRAY RIX

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

TEST CERTIFICATE

DETERMINATION OF POINT LOAD STRENGTH INDEX OF ROCK
METHOD IN ACCORDANCE WITH ASTM STANDARD D 5731

CLIENT	LK Consult Ltd
SITE	LKC 20 1328 - Rochdale Road, Manchester
JOB NUMBER	MRN 3816/52

SAMPLE LABEL	BH2 30-33m	DATE SAMPLED	Not advised
LAB SAMPLE No	89287	DATE RECEIVED	05-May-20
DATE TESTED	11-May-20	SAMPLED BY	Client

MATERIAL	Rock Core
ADVISED SOURCE	Site Investigation Sample

Sample Number	Test Type	D (mm)	*W (mm)	Load (P) (kN)	D_e^2 (mm ²)	D_e (mm)	I_s (MPa)	F	$I_{s(50)}$ (MPa)
1	D	85.0		2.8	7225.00	85.00	0.39	1.27	0.49
2	D	85.0		1.8	7225.00	85.00	0.25	1.27	0.32
3	D	85.0		1.4	7225.00	85.00	0.19	1.27	0.25
4	D	85.0		2.1	7225.00	85.00	0.29	1.27	0.37
5	D	85.0		1.8	7225.00	85.00	0.25	1.27	0.32
6	D	85.0		1.7	7225.00	85.00	0.24	1.27	0.30
7	D	85.0		1.9	7225.00	85.00	0.26	1.27	0.33
8	D	85.0		2.0	7225.00	85.00	0.28	1.27	0.35
9	D	85.0		2.0	7225.00	85.00	0.28	1.27	0.35
10	D	85.0		1.3	7225.00	85.00	0.18	1.27	0.23
11					0.00	0.00	0.00	0.00	0.00
12					0.00	0.00	0.00	0.00	0.00
13					0.00	0.00	0.00	0.00	0.00
14					0.00	0.00	0.00	0.00	0.00
15					0.00	0.00	0.00	0.00	0.00
16					0.00	0.00	0.00	0.00	0.00
17					0.00	0.00	0.00	0.00	0.00
18					0.00	0.00	0.00	0.00	0.00
19					0.00	0.00	0.00	0.00	0.00
20					0.00	0.00	0.00	0.00	0.00

*W Entry required if test type is not Diametrical

REMARKS

SIGNED 

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

DATE 13-May-20

MURRAY RIX

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

TEST CERTIFICATE
DETERMINATION OF THE COMPRESSIVE STRENGTH OF INTACT ROCK CORE
SPECIMENS
ASTM D7012 – 14 Method C

Client
Address

LK Consult Ltd
Unit 29 Eton Business Park
Eton Hill Road
Radcliffe
Greater Manchester
M26 2ZS

Site

LKC 20 1328 – Rochdale Road, Manchester

Job No. MRN 816/52

Laboratory Sample Number 89288

Site Reference Number

BH3 29-32m

Date of Receipt 05 May 2020

Date of Test 11 May 2020

Dimensions

Tested by	MW	Diameter	85.0 mm
Length after preparation	170 mm	Length/diameter ratio	2.00

Method of End Preparation Saw/Grinding

Time in Water prior to test 0 hours

Material	Rock Core	Site Mark	BH3 29-32m
Sample Location	Not advised	Tested By	MW

Date of Drilling Not advised

Drilled by Others

Description of core after test	Split vertically from top to bottom, with no visible end effects
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Compressive Strength

Load at Failure	kN	66.2	Measured Compressive Strength	N/mm ²	11.7
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Compressive Strength 11.7 MPa

Comments/Deviations from standard method/Abnormalities noted during visual inspection.

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

Signature



Date 13 May 2020

MURRAY RIX

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

TEST CERTIFICATE

DETERMINATION OF POINT LOAD STRENGTH INDEX OF ROCK
METHOD IN ACCORDANCE WITH ASTM STANDARD D 5731

CLIENT	LK Consult Ltd
SITE	LKC 20 1328 - Rochdale Road, Manchester
JOB NUMBER	MRN 3816/52

SAMPLE LABEL	BH3 29-32m	DATE SAMPLED	Not advised
LAB SAMPLE No	89289	DATE RECEIVED	05-May-20
DATE TESTED	11-May-20	SAMPLED BY	Client

MATERIAL	Rock Core
ADVISED SOURCE	Site Investigation Sample

Sample Number	Test Type	D (mm)	*W (mm)	Load (P) (kN)	D_e^2 (mm ²)	D_e (mm)	I_s (MPa)	F	$I_{s(50)}$ (MPa)
1	D	85.0		1.3	7225.00	85.00	0.18	1.27	0.23
2	D	85.0		1.4	7225.00	85.00	0.19	1.27	0.25
3	D	85.0		1.4	7225.00	85.00	0.19	1.27	0.25
4	D	85.0		1.3	7225.00	85.00	0.18	1.27	0.23
5	D	85.0		1.7	7225.00	85.00	0.24	1.27	0.30
6	D	85.0		1.1	7225.00	85.00	0.15	1.27	0.19
7	D	85.0		1.3	7225.00	85.00	0.18	1.27	0.23
8	D	85.0		1.4	7225.00	85.00	0.19	1.27	0.25
9	D	85.0		1.5	7225.00	85.00	0.21	1.27	0.26
10	D	85.0		1.3	7225.00	85.00	0.18	1.27	0.23
11					0.00	0.00	0.00	0.00	0.00
12					0.00	0.00	0.00	0.00	0.00
13					0.00	0.00	0.00	0.00	0.00
14					0.00	0.00	0.00	0.00	0.00
15					0.00	0.00	0.00	0.00	0.00
16					0.00	0.00	0.00	0.00	0.00
17					0.00	0.00	0.00	0.00	0.00
18					0.00	0.00	0.00	0.00	0.00
19					0.00	0.00	0.00	0.00	0.00
20					0.00	0.00	0.00	0.00	0.00

*W Entry required if test type is not Diametrical

REMARKS

SIGNED 

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

DATE 13-May-20

TEST REPORT

Client LK Consult Ltd

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

Contract LKC 20 1328 –
Rochdale Road, Manchester

Job Number MRN 3816/49
Date of Issue 29 April 2020
Page 1 of 9

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. This does not, however, guarantee the balance of the materials from which the tested samples have been taken to be of equal quality.

MURRAY RIX

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



TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

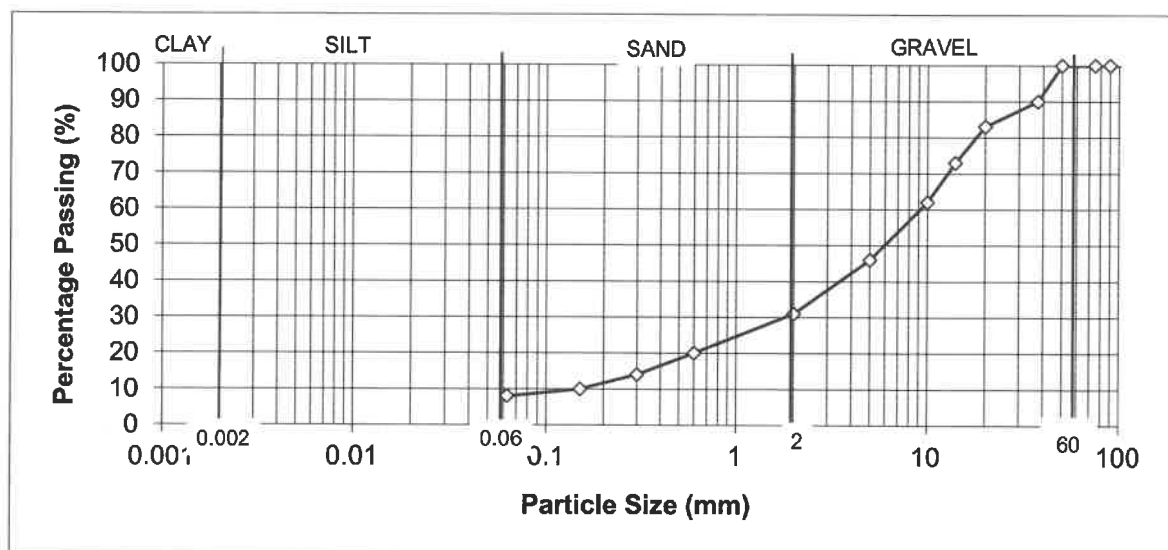
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 20 1328 - Rochdale Road, Manchester
JOB NUMBER	MRN 3816/49

SAMPLE LABEL	CP02 CL-1.2 Bulk	DATE SAMPLED	Not advised
LAB SAMPLE No	89041	DATE RECEIVED	21-Apr-20
DATE TESTED	21-Apr-20	SAMPLED BY	Client

MATERIAL	Brown silty sandy fine to coarse GRAVEL
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	62	
90	100		5	46	
75	100		2	31	
50	100		0.6	20	
37.5	90		0.3	14	
20	83		0.15	10	
14	73		0.063	8	



REMARKS

As received moisture content = 8.5%

SIGNED

NAME

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

DATE

03-Apr-20

MURRAY RIX

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

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.5: 1990

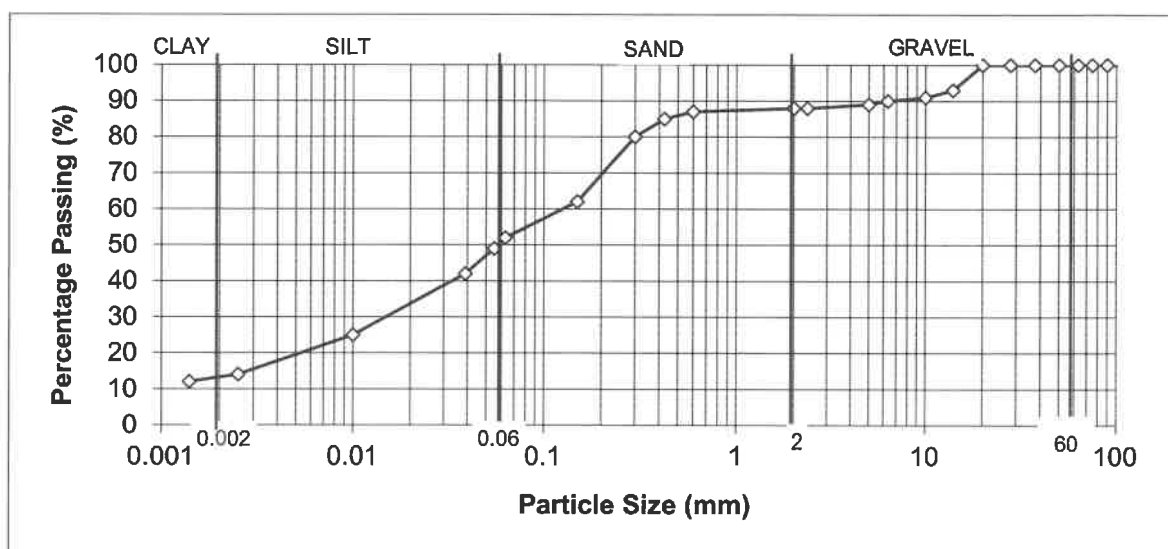
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 20 1328 - Rochdale Road, Manchester
JOB NUMBER	MRN 3816/49

SAMPLE LABEL	CP02 1.2-1.65 Bulk	DATE SAMPLED	Not advised
LAB SAMPLE No	89043	DATE RECEIVED	21-Apr-20
DATE TESTED	21-Apr-20	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with occasional gravel
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2.36	88	
90	100		2	88	
75	100		0.6	87	
63	100		0.425	85	
50	100		0.3	80	
37.5	100		0.15	62	
28	100		0.063	52	
20	100		0.055	49	
14	93		0.039	42	
10	91		0.01	25	
6.3	90		0.0025	14	
5	89		0.0014	12	



REMARKS

As received moisture content = 22%

SIGNED

NAME

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

DATE

29-Apr-20

MURRAY RIX

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

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 8 SINGLE STAGE

CLIENT	LK Consult Ltd
SITE	LKC 20 1328 – Rochdale Road, Manchester
JOB NUMBER	MRN 3816/49

SAMPLE LABEL	CP02 U1 2-2.45	DATE SAMPLED	Not advised
LAB SAMPLE No	89044	DATE RECEIVED	21 April 2020
DATE TESTED	21 April 2020	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation sample

SPECIMEN LENGTH	200	mm
SPECIMEN DIAMETER	102	mm
MOISTURE CONTENT OF SAMPLE	18	%
BULK DENSITY	2.20	Mg/m ³
DRY DENSITY	1.87	Mg/m ³
DEPTH OF TOP OF SPECIMEN	2.10	m
RATE OF STRAIN	2	%/min
RUBBER MEMBRANE THICKNESS	0.6	mm

**SPECIMEN AT
FAILURE**



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
50	17	2.0	239.7	120

REMARKS

SIGNED

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

DATE 29 April 2020

MURRAY RIX

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

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 8 SINGLE STAGE

CLIENT	LK Consult Ltd
SITE	LKC 20 1328 – Rochdale Road, Manchester
JOB NUMBER	MRN 3816/49

SAMPLE LABEL	CP02 U2 5-5.45	DATE SAMPLED	Not advised
LAB SAMPLE No	89045	DATE RECEIVED	21 April 2020
DATE TESTED	21 April 2020	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation sample

SPECIMEN LENGTH	199	mm
SPECIMEN DIAMETER	96	mm
MOISTURE CONTENT OF SAMPLE	18	%
BULK DENSITY	2.15	Mg/m ³
DRY DENSITY	1.82	Mg/m ³
DEPTH OF TOP OF SPECIMEN	5.10	m
RATE OF STRAIN	2	%/min
RUBBER MEMBRANE THICKNESS	0.6	mm

SPECIMEN AT
FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
100	20	2.0	180.1	90

REMARKS

SIGNED 

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

DATE 29 April 2020

MURRAY RIX

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

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.5: 1990

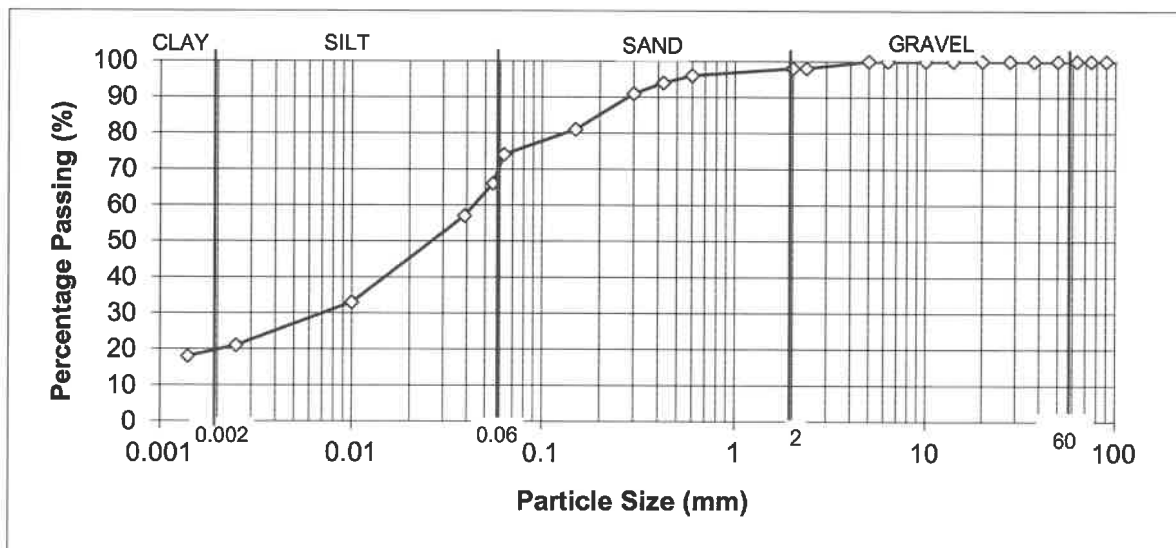
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 20 1328 - Rochdale Road, Manchester
JOB NUMBER	MRN 3816/49

SAMPLE LABEL	CP02 8-8.45 bulk	DATE SAMPLED	Not advised
LAB SAMPLE No	89046	DATE RECEIVED	21-Apr-20
DATE TESTED	21-Apr-20	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2.36	98	
90	100		2	98	
75	100		0.6	96	
63	100		0.425	94	
50	100		0.3	91	
37.5	100		0.15	81	
28	100		0.063	74	
20	100		0.055	66	
14	100		0.039	57	
10	100		0.01	33	
6.3	100		0.0025	21	
5	100		0.0014	18	



REMARKS

As received moisture content = 16%

SIGNED

NAME

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

DATE

29-Apr-20

MURRAY RIX

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



TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

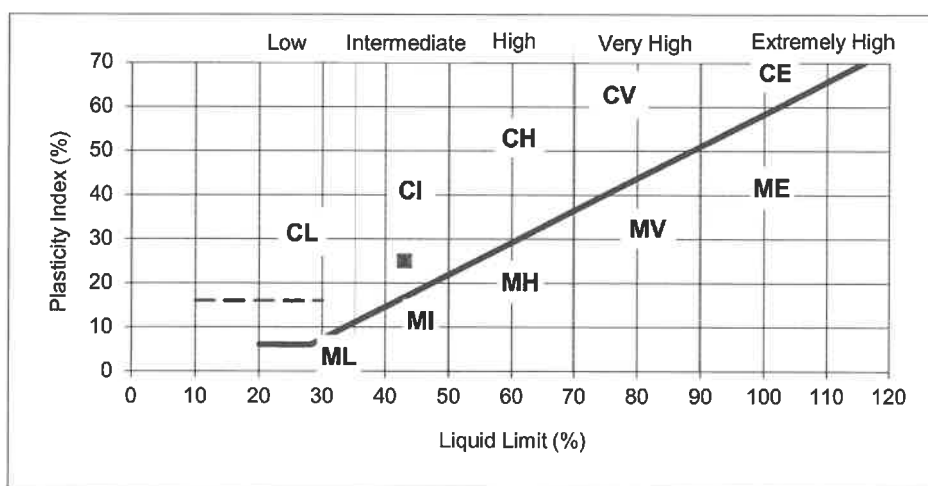
BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	LK Consult Ltd
SITE	LKC 20 1328 - Rochdale Road, Manchester
JOB NUMBER	MRN 3816/49

SAMPLE LABEL	WS101 B4 3.5-4m	DATE SAMPLED	Not advised
SAMPLE No.	89038	DATE RECEIVED	21-Apr-20
DATE TESTED	21-Apr-20	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY
ADVISED SOURCE	Site Investigation Sample

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
20	43	18	25	100



REMARKS

Sample tested in natural condition

SIGNED

NAME

Page 7 of 9

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

DATE

29-Apr-20

MURRAY RIX

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



TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

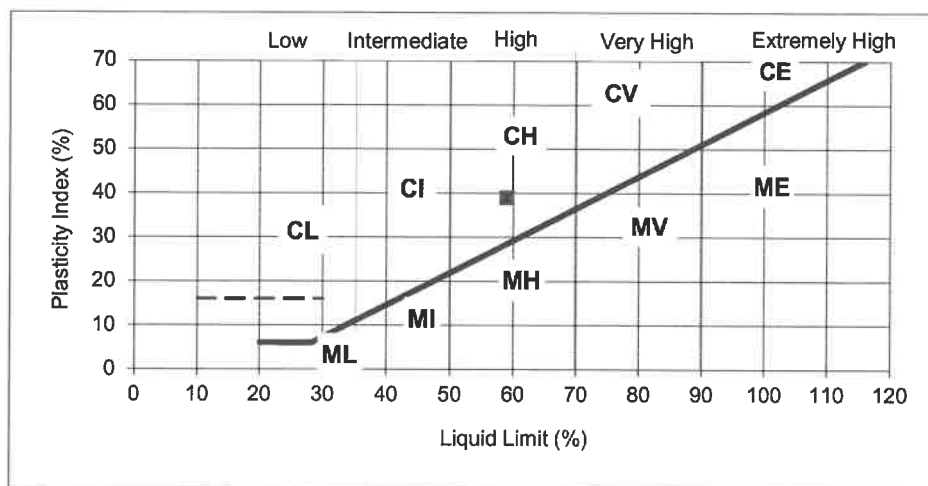
BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	LK Consult Ltd
SITE	LKC 20 1328 - Rochdale Road, Manchester
JOB NUMBER	MRN 3816/49

SAMPLE LABEL	WS102 B4 2.7-3m	DATE SAMPLED	Not advised
SAMPLE No.	89039	DATE RECEIVED	21-Apr-20
DATE TESTED	21-Apr-20	SAMPLED BY	Client

MATERIAL	Soft brown silty sandy CLAY
ADVISED SOURCE	Site Investigation Sample

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
40	59	20	39	99



REMARKS

Sample tested in natural condition

SIGNED

NAME O.P. Davies BA (Hons)
Page 8 of 9 (Laboratory Manager)

DATE 29-Apr-20

MURRAY RIX

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



TEST CERTIFICATE

LIQUID AND PLASTIC LIMIT

BS 1377: PART 2: 1990 Clause 4.4 ONE POINT METHOD & Clause 5.3

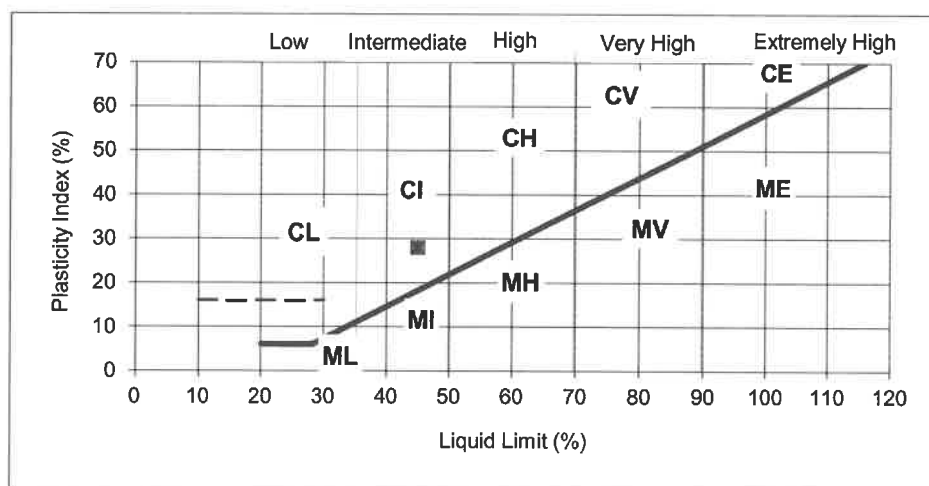
MOISTURE CONTENT METHOD BS 1377: PART 2: 1990 Clause 3.2

CLIENT	LK Consult Ltd
SITE	LKC 20 1328 - Rochdale Road, Manchester
JOB NUMBER	MRN 3816/49

SAMPLE LABEL	WS103 B4 2.4-3m	DATE SAMPLED	Not advised
SAMPLE No.	89040	DATE RECEIVED	21-Apr-20
DATE TESTED	21-Apr-20	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY
ADVISED SOURCE	Site Investigation Sample

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
19	45	17	28	100



REMARKS

Sample tested in natural condition

SIGNED

NAME O.P. Davies BA (Hons)
Page 9 of 9 (Laboratory Manager)

DATE 29-Apr-20

TEST REPORT

Client LK Consult Ltd

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

Contract LKC 20 1328 –
Rochdale Road, Manchester

Job Number MRN 3816/50
Date of Issue 05 May 2020
Page 1 of 9

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. This does not, however, guarantee the balance of the materials from which the tested samples have been taken to be of equal quality.

MURRAY RIX

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



TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.2: 1990

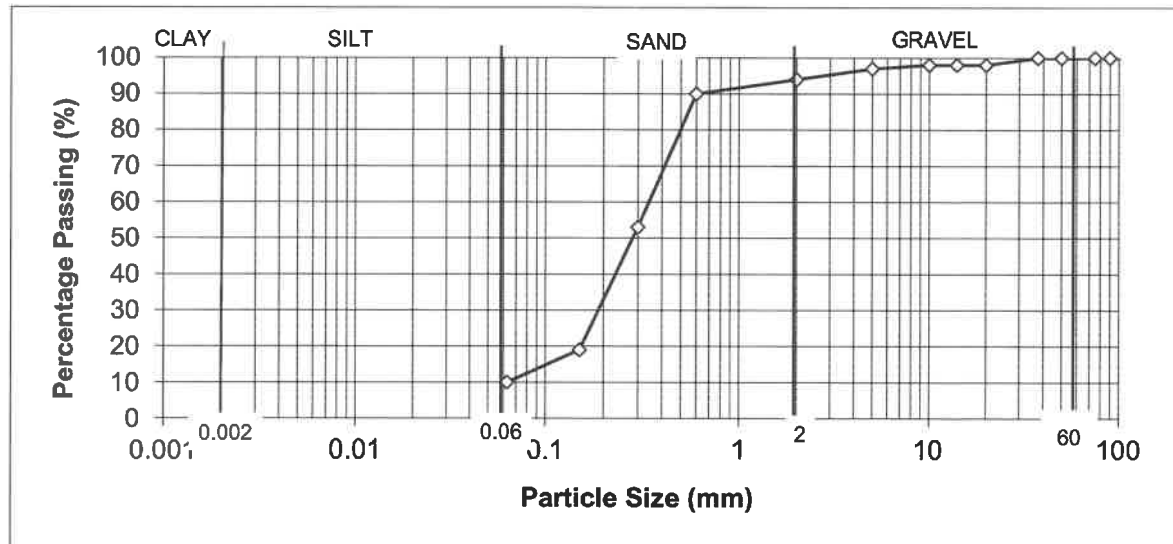
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 20 1328 - Rochdale Road, Manchester
JOB NUMBER	MRN 3816/50

SAMPLE LABEL	CP01 24-24.45 Bulk	DATE SAMPLED	Not advised
LAB SAMPLE No	89139	DATE RECEIVED	28-Apr-20
DATE TESTED	28-Apr-20	SAMPLED BY	Client

MATERIAL	Brown grey silty fine to coarse SAND with rare gravel
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		10	98	
90	100		5	97	
75	100		2	94	
50	100		0.6	90	
37.5	100		0.3	53	
20	98		0.15	19	
14	98		0.063	10	



REMARKS

As received moisture content = 17%

SIGNED

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

DATE 05-May-20

MURRAY RIX

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

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS 1377: PART 2: Clause 9.5: 1990

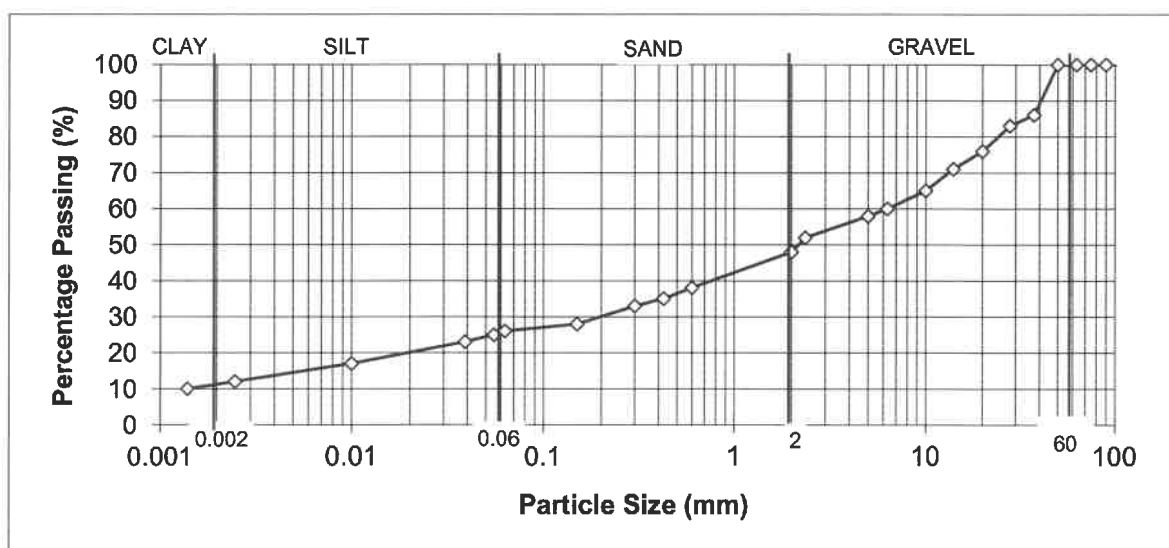
Determination of Moisture Content in accordance with BS 1377: PART 2: Clause 3: 1990 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 20 1328 - Rochdale Road, Manchester
JOB NUMBER	MRN 3816/50

SAMPLE LABEL	CP01 2-2.45 Bulk	DATE SAMPLED	Not advised
LAB SAMPLE No	89140	DATE RECEIVED	28-Apr-20
DATE TESTED	28-Apr-20	SAMPLED BY	Client

MATERIAL	Brown clay bound silty SAND and GRAVEL
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2.36	52	
90	100		2	48	
75	100		0.6	38	
63	100		0.425	35	
50	100		0.3	33	
37.5	86		0.15	28	
28	83		0.063	26	
20	76		0.055	25	
14	71		0.039	23	
10	65		0.01	17	
6.3	60		0.0025	12	
5	58		0.0014	10	



REMARKS

As received moisture content = 24%

SIGNED

NAME

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

DATE

05-May-20

MURRAY RIX

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

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION BS 1377: PART 7: 1990:CLAUSE 8 SINGLE STAGE

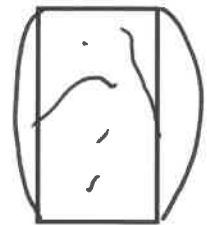
CLIENT	LK Consult Ltd
SITE	LKC 20 1328 – Rochdale Road, Manchester
JOB NUMBER	MRN 3816/50

SAMPLE LABEL	CP01 4-4.45 U100	DATE SAMPLED	Not advised
LAB SAMPLE No	89141	DATE RECEIVED	28 April 2020
DATE TESTED	29 April 2020	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation sample

SPECIMEN LENGTH	200	mm
SPECIMEN DIAMETER	100	mm
MOISTURE CONTENT OF SAMPLE	19	%
BULK DENSITY	2.23	Mg/m ³
DRY DENSITY	1.88	Mg/m ³
DEPTH OF TOP OF SPECIMEN	4.10	m
RATE OF STRAIN	2	%/min
RUBBER MEMBRANE THICKNESS	0.6	mm

SPECIMEN AT
FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
100	20	2.0	163.8	82

REMARKS

SIGNED 

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

DATE 05 May 2020

MURRAY RIX

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

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION BS 1377: PART 7: 1990:CLAUSE 8 SINGLE STAGE

CLIENT	LK Consult Ltd
SITE	LKC 20 1328 – Rochdale Road, Manchester
JOB NUMBER	MRN 3816/50

SAMPLE LABEL	CP01 8-8.45 U100	DATE SAMPLED	Not advised
LAB SAMPLE No	89142	DATE RECEIVED	28 April 2020
DATE TESTED	29 April 2020	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation sample

SPECIMEN LENGTH	196	mm
SPECIMEN DIAMETER	102	mm
MOISTURE CONTENT OF SAMPLE	15	%
BULK DENSITY	2.20	Mg/m ³
DRY DENSITY	1.92	Mg/m ³
DEPTH OF TOP OF SPECIMEN	8.05	m
RATE OF STRAIN	2	%/min
RUBBER MEMBRANE THICKNESS	0.6	mm

SPECIMEN AT
FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
180	18	2.0	246.4	123

REMARKS

SIGNED



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

DATE 05 May 2020

MURRAY RIX

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

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION BS 1377: PART 7: 1990:CLAUSE 8 SINGLE STAGE

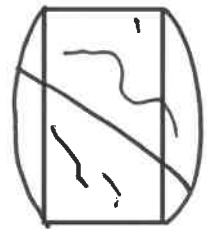
CLIENT	LK Consult Ltd
SITE	LKC 20 1328 – Rochdale Road, Manchester
JOB NUMBER	MRN 3816/50

SAMPLE LABEL	CP02 9.5-9.95 U100	DATE SAMPLED	Not advised
LAB SAMPLE No	89143	DATE RECEIVED	28 April 2020
DATE TESTED	29 April 2020	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation sample

SPECIMEN LENGTH	181	mm
SPECIMEN DIAMETER	101	mm
MOISTURE CONTENT OF SAMPLE	15	%
BULK DENSITY	2.25	Mg/m ³
DRY DENSITY	1.95	Mg/m ³
DEPTH OF TOP OF SPECIMEN	9.60	m
RATE OF STRAIN	2	%/min
RUBBER MEMBRANE THICKNESS	0.6	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	18	2.0	256.0	128

REMARKS

SIGNED



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

DATE 05 May 2020

MURRAY RIX

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

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377: PART 7: 1990:CLAUSE 8 SINGLE STAGE

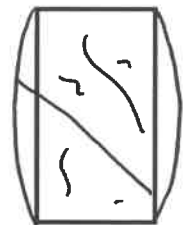
CLIENT	LK Consult Ltd
SITE	LKC 20 1328 – Rochdale Road, Manchester
JOB NUMBER	MRN 3816/50

SAMPLE LABEL	CP02 5-5.45 U100	DATE SAMPLED	Not advised
LAB SAMPLE No	89144	DATE RECEIVED	28 April 2020
DATE TESTED	29 April 2020	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation sample

SPECIMEN LENGTH	201	mm
SPECIMEN DIAMETER	102	mm
MOISTURE CONTENT OF SAMPLE	18	%
BULK DENSITY	2.14	Mg/m ³
DRY DENSITY	1.82	Mg/m ³
DEPTH OF TOP OF SPECIMEN	5.10	m
RATE OF STRAIN	2	%/min
RUBBER MEMBRANE THICKNESS	0.6	mm

**SPECIMEN AT
FAILURE**



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
120	20	2.0	191.9	96

REMARKS

SIGNED

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

DATE 05 May 2020

MURRAY RIX

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

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION BS 1377: PART 7: 1990:CLAUSE 8 SINGLE STAGE

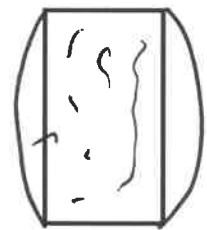
CLIENT	LK Consult Ltd
SITE	LKC 20 1328 – Rochdale Road, Manchester
JOB NUMBER	MRN 3816/50

SAMPLE LABEL	CP02 9-9.45 U100	DATE SAMPLED	Not advised
LAB SAMPLE No	89145	DATE RECEIVED	28 April 2020
DATE TESTED	29 April 2020	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation sample

SPECIMEN LENGTH	205	mm
SPECIMEN DIAMETER	102	mm
MOISTURE CONTENT OF SAMPLE	15	%
BULK DENSITY	2.22	Mg/m ³
DRY DENSITY	1.93	Mg/m ³
DEPTH OF TOP OF SPECIMEN	9.05	m
RATE OF STRAIN	2	%/min
RUBBER MEMBRANE THICKNESS	0.6	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
200	20	2.0	215.7	108

REMARKS

SIGNED 

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

DATE 05 May 2020

MURRAY RIX

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

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION BS 1377: PART 7: 1990:CLAUSE 8 SINGLE STAGE

CLIENT	LK Consult Ltd
SITE	LKC 20 1328 – Rochdale Road, Manchester
JOB NUMBER	MRN 3816/50

SAMPLE LABEL	CP02 13-13.45 U100	DATE SAMPLED	Not advised
LAB SAMPLE No	89146	DATE RECEIVED	28 April 2020
DATE TESTED	30 April 2020	SAMPLED BY	Client

MATERIAL	Stiff brown silty sandy CLAY with rare gravel
ADVISED SOURCE	Site Investigation sample

SPECIMEN LENGTH	76	mm
SPECIMEN DIAMETER	38	mm
MOISTURE CONTENT OF SAMPLE	10	%
BULK DENSITY	2.29	Mg/m ³
DRY DENSITY	2.08	Mg/m ³
DEPTH OF TOP OF SPECIMEN	13.20	m
RATE OF STRAIN	2	%/min
RUBBER MEMBRANE THICKNESS	0.6	mm

SPECIMEN AT FAILURE



Measured Cell Pressure (kPa)	Strain at Failure (%)	Membrane Correction (kPa)	Corrected Max Deviator Stress (kPa)	Shear Stress Cu (kPa)
280	17	2.0	239.8	120

REMARKS

U38 Sub-sample taken to give required length/diameter ratio

SIGNED



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

DATE 05 May 2020

Appendix E

Generic Assessment Criteria Values

Category 4 Screening Levels (C4SL)

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	168 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 mg/kg	5.3 mg/kg	5.7 mg/kg	76 mg/kg	10 mg/kg	21 mg/kg
Cadmium	26 mg/kg	149 mg/kg	4.9 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	23 mg/kg	250 mg/kg
Lead	200 mg/kg	310 mg/kg	80 mg/kg	2330 mg/kg	630 mg/kg	1300 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	6%	180	180	230	980	230	3,400
	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	4	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	1%	1,600 ^f	1,900 ^f	1,200 ^f	28,000 ^f	3,800 ^f	7,800 ^f
+Aromatic	2.5%	1,800 ^f	1,900 ^f	2,100 ^f	28,000 ^f	3,800 ^f	7,800 ^f
>EC44	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.

		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
	Endosulfans (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 F

Hazard Index Spreadsheets

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

where: HI = Hazard Index
 HQ = Hazard Quotient
 Fi = Fraction I
 SGV/GAC = Soil Guideline Value or Generic Assessment Criteria

Commercial

Job Rochdale Road, Manchester
Job No. LKC 20 1328
SOM 4%
Comment Based upon the highest concentrations (WS103 0.1-0.5m) as a conservative measure.

Commercial

	1% SGV/SSV	2.50% SGV/GAC	6% SGV/SSV	Max Soil concn.	HQ (1%SOM)	HQ (2.5%SOM)	HQ (6% SOM)
Aliphatic							
EC5-EC6	3200	5900	12000	1	0.0003125	0.00016949	8.3333E-05
EC6-EC8	7800	17000	40000	1	0.0001282	5.8824E-05	0.000025
EC8-EC10	2000	4800	11000	1	0.0005	0.00020833	9.0909E-05
EC10-EC12	9700	23000	47000	1	0.0001031	4.3478E-05	2.1277E-05
EC12-EC16	59000	82000	90000	3.2	5.424E-05	3.9024E-05	3.5556E-05
EC16-EC21	160000	1700000	1800000	38	0.0002375	2.2353E-05	2.1111E-05
EC21-EC35							
EC35-EC44	160000	1700000	1800000	100	0.000625	5.8824E-05	5.5556E-05
Aromatic							
EC5-EC7 (benzene)	26000	46000	86000	1	3.846E-05	2.1739E-05	1.1628E-05
EC7-EC8 (tolulene)	56000	110000	180000	1	1.786E-05	9.0909E-06	5.5556E-06
EC8-EC10	3500	8100	17000	1	0.0002857	0.00012346	5.8824E-05
EC10-EC12	16000	28000	34000	1	0.0000625	3.5714E-05	2.9412E-05
EC12-EC16	36000	37000	38000	3.6	0.0001	9.7297E-05	9.4737E-05
EC16-EC21	28000	28000	28000	140	0.005	0.005	0.005
EC21-EC35	28000	28000	28000	780	0.0278571	0.02785714	0.02785714
EC35-EC44	28000	28000	28000	3600	0.1285714	0.12857143	0.12857143

HI	0.16	0.16	0.16
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Sample number	MAX or US95
Depth	
Aliphatic	
EC5-EC6	1
EC6-EC8	1
EC8-EC10	1
EC10-EC12	1
EC12-EC16	3.2
EC16-EC21	21
EC21-EC35	38
EC35-EC44	100
Aromatic	
EC5-EC7 (benzene)	1
EC7-EC8 (tolulene)	1
EC8-EC10	1
EC10-EC12	1
EC12-EC16	3.6
EC16-EC21	140
EC21-EC35	780
EC35-EC44	3600
0.00E+00 0.00E+00 0.00E+00 0.00E+00	

16

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

where: HI = Hazard Index
HQ = Hazard Quotient
Fi = Fraction I
SGV/GAC = Soil Guideline Value or Generic Assessment Criteria

Commercial

Job Rochdale Road, Manchester
Job No. LKC 20 1328
SOM 2%
Comment Based upon the highest concentrations (TP104 0.55-0.6m) as a conservative measure.

Commercial

	1% SGV/SSV	2.50% SGV/GAC	6% SGV/SSV	Max Soil concn.	HQ (1% SOM)	HQ (2.5% SOM)	HQ (6% SOM)
Aliphatic							
EC5-EC6	3200	5900	12000	1	0.0003125	0.00016949	8.3333E-05
EC6-EC8	7800	17000	40000	1	0.00012821	5.8824E-05	0.000025
EC8-EC10	2000	4800	11000	100	0.05	0.02083333	0.00909091
EC10-EC12	9700	23000	47000	570	0.05876289	0.02478261	0.01212766
EC12-EC16	59000	82000	90000	2900	0.04915254	0.03536585	0.03222222
EC16-EC21	160000	1700000	1800000	1200	0.0075	0.00070588	0.00066667
EC21-EC35							
EC35-EC44	160000	1700000	1800000	1	0.00000625	5.8824E-07	5.5556E-07
Aromatic							
EC5-EC7 (benzene)	26000	46000	86000	1	3.8462E-05	2.1739E-05	1.1628E-05
EC7-EC8 (tolulene)	56000	110000	180000	1	1.7857E-05	9.0909E-06	5.5556E-06
EC8-EC10	3500	8100	17000	1	0.00028571	0.00012346	5.8824E-05
EC10-EC12	16000	28000	34000	140	0.00875	0.005	0.00411765
EC12-EC16	36000	37000	38000	1400	0.03888889	0.03783784	0.03684211
EC16-EC21	28000	28000	28000	1000	0.03571429	0.03571429	0.03571429
EC21-EC35	28000	28000	28000	240	0.00857143	0.00857143	0.00857143
EC35-EC44	28000	28000	28000	1	3.5714E-05	3.5714E-05	3.5714E-05

HI	0.26	0.17	0.14
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Sample number	MAX or US95	
Depth		
Aliphatic		
EC5-EC6	1	< 1.0
EC6-EC8	1	< 1.0
EC8-EC10	100	100
EC10-EC12	570	570
EC12-EC16	2900	2900
EC16-EC21	4000	4000
EC21-EC35	1200	1200
EC35-EC44	1	< 1.0
Aromatic		
EC5-EC7 (benzene)	1	< 1.0
EC7-EC8 (tolulene)	1	< 1.0
EC8-EC10	1	< 1.0
EC10-EC12	140	140
EC12-EC16	1400	1400
EC16-EC21	1000	1000
EC21-EC35	240	240
EC35-EC44	1	< 1.0
0.00E+00 0.00E+00 0.00E+00 0.00E+00		

Appendix G

HazWaste Online Classification Report

Waste Classification Report



J68NC-FH5W6-QY98W

Job name

LKC 20 1328

Description/Comments

Project

LKC 20 1328

Site

Rochdale Road

Related Documents

#	Name	Description
1	HWOL_20-10235-20200416 134246.hwol	.hwol file used to create the Job
2	HWOL_20-10681-20200424 140624.hwol	.hwol file used to create the Job
3	HWOL_20-11054-20200430 093150.hwol	.hwol file used to create the Job

Waste Stream Template

Example waste stream template for contaminated soils

Classified by

Name: Peter Dunn	Company: LK Group	HazWasteOnline™ Training Record:	
Date: 20 May 2020 08:43 GMT	Unit 29, Eton Business Park	Course	Date
Telephone: 0161 763 7200	Eton Hill Rd, Radcliffe	Hazardous Waste Classification	17 Sep 2019
	Manchester	Advanced Hazardous Waste Classification	18 Sep 2019
	M26 2ZS		

Report

Created by: Peter Dunn
Created date: 20 May 2020 08:43 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	TP205B-999230-23/04/2020-0.85	0.85-1.40	Non Hazardous		3
2	TP206-999231-23/04/2020-0.25	0.25-1.00	Non Hazardous		5
3	TP206-999232-23/04/2020-1.50	1.50-2.20	Non Hazardous		7
4	TP207-999233-23/04/2020-0.20	0.20-0.50	Non Hazardous		8
5	TP101 D1-997787-16/04/2020-0.10	0.10-1.00	Non Hazardous		10
6	TP102 D1-997788-16/04/2020-0.30	0.30-1.00	Non Hazardous		12
7	TP103 D1-997789-16/04/2020-0.30	0.30-0.90	Non Hazardous		14
8	TP104 D2-997791-16/04/2020-0.55	0.55-0.60	Hazardous	HP 3(i), HP 7, HP 11	16
9	TP104 D4-997792-16/04/2020-1.00	1.00-2.00	Non Hazardous		19
10	TP105 D1-997793-16/04/2020-0.20	0.20-0.50	Hazardous	HP 8	21

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
11	WS101 D1-996046-06/04/2020-0.2	0.2-0.5	Non Hazardous		23
12	WS101 D3-996048-06/04/2020-2.5	2.5-3.0	Non Hazardous		25
13	WS102 D1-996049-06/04/2020-0.2	0.2-0.6	Non Hazardous		26
14	WS102 D3-996051-06/04/2020-2.6	2.6-3.0	Non Hazardous		28
15	WS103 D1-996052-06/04/2020-0.1	0.1-0.5	Hazardous	HP 3(i), HP 7, HP 11	29
16	TP105 D1-996054-06/04/2020-0.3	0.3-0.6	Hazardous	HP 10, HP 14	32
17	TP106 D1-996055-06/04/2020-0.2	0.2-0.5	Non Hazardous		34
18	TP107 D1-996056-06/04/2020-0.0	0.0-0.5	Non Hazardous		36

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Classification of sample: TP205B-999230-23/04/2020-0.85

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

Sample details

Sample Name:	LoW Code:	
TP205B-999230-23/04/2020-0.85	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)
0.85-1.40 m		
Moisture content:		
6.5%		
(wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 6.5% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
2	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
3	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
4	toluene				0.0018 mg/kg		0.0016 mg/kg	0.000000168 %	✓	
	601-021-00-3	203-625-9	108-88-3							
5	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
6	xylene				0.0072 mg/kg		0.0067 mg/kg	0.000000673 %	✓	
	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]							
Total:								0.001 %		

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)
<LOD	Below limit of detection
ND	Not detected

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.: 1.68e-07%)

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

Because of determinand:

xylene: (conc.: 6.73e-07%)

Classification of sample: TP206-999231-23/04/2020-0.25

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

Sample details

Sample Name:	TP206-999231-23/04/2020-0.25	LoW Code:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	0.25-1.00 m	Chapter:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:	13%	Entry:	
(wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				15 mg/kg	1.32	17.23	mg/kg	0.00172 %	✓	
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium oxide }				0.5 mg/kg	1.142	0.497	mg/kg	0.0000497 %	✓	
	048-002-00-0	215-146-2	1306-19-0								
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				30 mg/kg	1.462	38.147	mg/kg	0.00381 %	✓	
		215-160-9	1308-38-9								
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5 mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0								
5	copper { dicopper oxide; copper (I) oxide }				37 mg/kg	1.126	36.242	mg/kg	0.00362 %	✓	
	029-002-00-X	215-270-7	1317-39-1								
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	190 mg/kg		165.3	mg/kg	0.0165 %	✓	
	082-001-00-6										
7	mercury { mercury dichloride }				0.22 mg/kg	1.353	0.259	mg/kg	0.0000259 %	✓	
	080-010-00-X	231-299-8	7487-94-7								
8	nickel { nickel chromate }				20 mg/kg	2.976	51.787	mg/kg	0.00518 %	✓	
	028-035-00-7	238-766-5	14721-18-7								
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2 mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
	034-002-00-8										
10	zinc { zinc oxide }				65 mg/kg	1.245	70.389	mg/kg	0.00704 %	✓	
	030-013-00-7	215-222-5	1314-13-2								
11	pH				10.9 pH		10.9	pH	10.9 pH		
12	naphthalene				0.42 mg/kg		0.365	mg/kg	0.0000365 %	✓	
	601-052-00-2	202-049-5	91-20-3								
13	acenaphthylene				<0.1 mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		205-917-1	208-96-8								

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
14	acenaphthene	201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
15	fluorene	201-695-5	86-73-7		0.1	mg/kg		0.087	mg/kg	0.0000087 %	✓	
16	phenanthrene	201-581-5	85-01-8		0.86	mg/kg		0.748	mg/kg	0.0000748 %	✓	
17	anthracene	204-371-1	120-12-7		0.19	mg/kg		0.165	mg/kg	0.0000165 %	✓	
18	fluoranthene	205-912-4	206-44-0		1.3	mg/kg		1.131	mg/kg	0.000113 %	✓	
19	pyrene	204-927-3	129-00-0		1.1	mg/kg		0.957	mg/kg	0.0000957 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.51	mg/kg		0.444	mg/kg	0.0000444 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9	0.41	mg/kg		0.357	mg/kg	0.0000357 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.51	mg/kg		0.444	mg/kg	0.0000444 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.22	mg/kg		0.191	mg/kg	0.0000191 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.49	mg/kg		0.426	mg/kg	0.0000426 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		0.43	mg/kg		0.374	mg/kg	0.0000374 %	✓	
26	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
27	benzo[ghi]perylene	205-883-8	191-24-2		0.54	mg/kg		0.47	mg/kg	0.000047 %	✓	
28	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1	24	mg/kg	1.785	37.275	mg/kg	0.00373 %	✓	
Total:										0.0425 %		

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: TP206-999232-23/04/2020-1.50

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

Sample details

Sample Name:	LoW Code:	
TP206-999232-23/04/2020-1.50	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)
1.50-2.20 m		
Moisture content:		
14%		
(wet weight correction)		

Hazard properties

None identified

Determinands

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

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
2	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
3	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
4	toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
5	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
6	xylene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<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]							
Total:								0.001 %		

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)
<LOD	Below limit of detection
ND	Not detected

Classification of sample: TP207-999233-23/04/2020-0.20

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

Sample details

Sample Name:	LoW Code:
TP207-999233-23/04/2020-0.20	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.20-0.50 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
5.1%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 5.1% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				17 mg/kg	1.32	21.301 mg/kg	0.00213 %		✓	
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium oxide }				0.45 mg/kg	1.142	0.488 mg/kg	0.0000488 %		✓	
	048-002-00-0	215-146-2	1306-19-0								
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				32 mg/kg	1.462	44.385 mg/kg	0.00444 %		✓	
		215-160-9	1308-38-9								
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %			<LOD
	024-001-00-0	215-607-8	1333-82-0								
5	copper { dicopper oxide; copper (I) oxide }				180 mg/kg	1.126	192.324 mg/kg	0.0192 %		✓	
	029-002-00-X	215-270-7	1317-39-1								
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	120 mg/kg		113.88 mg/kg	0.0114 %		✓	
	082-001-00-6										
7	mercury { mercury dichloride }				0.2 mg/kg	1.353	0.257 mg/kg	0.0000257 %		✓	
	080-010-00-X	231-299-8	7487-94-7								
8	nickel { nickel chromate }				20 mg/kg	2.976	56.49 mg/kg	0.00565 %		✓	
	028-035-00-7	238-766-5	14721-18-7								
9	selenium { selenium compounds with the exception of cadmium selenosulfide and those specified elsewhere in this Annex }				<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %			<LOD
	034-002-00-8										
10	zinc { zinc oxide }				84 mg/kg	1.245	99.224 mg/kg	0.00992 %		✓	
	030-013-00-7	215-222-5	1314-13-2								
11	pH		PH		9.6 pH		9.6 pH	9.6 pH			
12	naphthalene				0.48 mg/kg		0.456 mg/kg	0.0000456 %		✓	
	601-052-00-2	202-049-5	91-20-3								
13	acenaphthylene				0.3 mg/kg		0.285 mg/kg	0.0000285 %		✓	
		205-917-1	208-96-8								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	acenaphthene	201-469-6	83-32-9		1.9 mg/kg		1.803 mg/kg	0.00018 %	✓	
15	fluorene	201-695-5	86-73-7		1.6 mg/kg		1.518 mg/kg	0.000152 %	✓	
16	phenanthrene	201-581-5	85-01-8		17 mg/kg		16.133 mg/kg	0.00161 %	✓	
17	anthracene	204-371-1	120-12-7		5.1 mg/kg		4.84 mg/kg	0.000484 %	✓	
18	fluoranthene	205-912-4	206-44-0		28 mg/kg		26.572 mg/kg	0.00266 %	✓	
19	pyrene	204-927-3	129-00-0		23 mg/kg		21.827 mg/kg	0.00218 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		12 mg/kg		11.388 mg/kg	0.00114 %	✓	
21	chrysene	601-048-00-0	205-923-4		8.8 mg/kg		8.351 mg/kg	0.000835 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		14 mg/kg		13.286 mg/kg	0.00133 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		4.8 mg/kg		4.555 mg/kg	0.000456 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		13 mg/kg		12.337 mg/kg	0.00123 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		8.8 mg/kg		8.351 mg/kg	0.000835 %	✓	
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		1.5 mg/kg		1.424 mg/kg	0.000142 %	✓	
27	benzo[ghi]perylene	205-883-8	191-24-2		7.7 mg/kg		7.307 mg/kg	0.000731 %	✓	
28	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8		23 mg/kg	1.785	38.965 mg/kg	0.0039 %	✓	
Total:								0.0709 %		

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: TP101 D1-997787-16/04/2020-0.10

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

Sample details

Sample Name:	LoW Code:	
TP101 D1-997787-16/04/2020-0.10	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)
0.10-1.00 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
	CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				15 mg/kg	1.32	17.428 mg/kg	0.00174 %		✓	
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium oxide }				0.77 mg/kg	1.142	0.774 mg/kg	0.0000774 %		✓	
	048-002-00-0	215-146-2	1306-19-0								
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				16 mg/kg	1.462	20.579 mg/kg	0.00206 %		✓	
		215-160-9	1308-38-9								
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %			<LOD
	024-001-00-0	215-607-8	1333-82-0								
5	copper { dicopper oxide; copper (I) oxide }				110 mg/kg	1.126	108.986 mg/kg	0.0109 %		✓	
	029-002-00-X	215-270-7	1317-39-1								
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	190 mg/kg		167.2 mg/kg	0.0167 %		✓	
	082-001-00-6										
7	mercury { mercury dichloride }				0.39 mg/kg	1.353	0.465 mg/kg	0.0000465 %		✓	
	080-010-00-X	231-299-8	7487-94-7								
8	nickel { nickel chromate }				27 mg/kg	2.976	70.716 mg/kg	0.00707 %		✓	
	028-035-00-7	238-766-5	14721-18-7								
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %			<LOD
	034-002-00-8										
10	zinc { zinc oxide }				200 mg/kg	1.245	219.07 mg/kg	0.0219 %		✓	
	030-013-00-7	215-222-5	1314-13-2								
11	pH		PH		9.6 pH		9.6 pH	9.6 pH			
12	naphthalene				0.4 mg/kg		0.352 mg/kg	0.0000352 %		✓	
	601-052-00-2	202-049-5	91-20-3								
13	acenaphthylene				0.13 mg/kg		0.114 mg/kg	0.0000114 %		✓	
		205-917-1	208-96-8								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	acenaphthene	201-469-6	83-32-9		0.45 mg/kg		0.396 mg/kg	0.0000396 %	✓	
15	fluorene	201-695-5	86-73-7		0.24 mg/kg		0.211 mg/kg	0.0000211 %	✓	
16	phenanthrene	201-581-5	85-01-8		2.6 mg/kg		2.288 mg/kg	0.000229 %	✓	
17	anthracene	204-371-1	120-12-7		0.88 mg/kg		0.774 mg/kg	0.0000774 %	✓	
18	fluoranthene	205-912-4	206-44-0		4.5 mg/kg		3.96 mg/kg	0.000396 %	✓	
19	pyrene	204-927-3	129-00-0		4.1 mg/kg		3.608 mg/kg	0.000361 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	2 mg/kg		1.76 mg/kg	0.000176 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9	1.9 mg/kg		1.672 mg/kg	0.000167 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	3 mg/kg		2.64 mg/kg	0.000264 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.9 mg/kg		0.792 mg/kg	0.0000792 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	2.5 mg/kg		2.2 mg/kg	0.00022 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		1.9 mg/kg		1.672 mg/kg	0.000167 %	✓	
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	0.35 mg/kg		0.308 mg/kg	0.0000308 %	✓	
27	benzo[ghi]perylene	205-883-8	191-24-2		1.5 mg/kg		1.32 mg/kg	0.000132 %	✓	
28	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1	23 mg/kg	1.785	36.132 mg/kg	0.00361 %	✓	
Total:								0.0667 %		

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: TP102 D1-997788-16/04/2020-0.30

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

Sample details

Sample Name:	LoW Code:	
TP102 D1-997788-16/04/2020-0.30	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)
0.30-1.00 m		
Moisture content:		
11%		
(wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				20	mg/kg	1.32	23.502	mg/kg	0.00235 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	cadmium { cadmium oxide }				0.57	mg/kg	1.142	0.58	mg/kg	0.000058 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17	mg/kg	1.462	22.113	mg/kg	0.00221 %	✓	
		215-160-9	1308-38-9									
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
5	copper { dicopper oxide; copper (I) oxide }				51	mg/kg	1.126	51.104	mg/kg	0.00511 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	190	mg/kg		169.1	mg/kg	0.0169 %	✓	
	082-001-00-6											
7	mercury { mercury dichloride }				0.68	mg/kg	1.353	0.819	mg/kg	0.0000819 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
8	nickel { nickel chromate }				23	mg/kg	2.976	60.924	mg/kg	0.00609 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
	034-002-00-8											
10	zinc { zinc oxide }				110	mg/kg	1.245	121.857	mg/kg	0.0122 %	✓	
	030-013-00-7	215-222-5	1314-13-2									
11	pH				9.1	pH		9.1	pH	9.1 pH		
12	naphthalene				0.52	mg/kg		0.463	mg/kg	0.0000463 %	✓	
	601-052-00-2	202-049-5	91-20-3									
13	acenaphthylene				0.12	mg/kg		0.107	mg/kg	0.0000107 %	✓	
		205-917-1	208-96-8									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	acenaphthene	201-469-6	83-32-9		0.29 mg/kg		0.258 mg/kg	0.0000258 %	✓	
15	fluorene	201-695-5	86-73-7		0.22 mg/kg		0.196 mg/kg	0.0000196 %	✓	
16	phenanthrene	201-581-5	85-01-8		2 mg/kg		1.78 mg/kg	0.000178 %	✓	
17	anthracene	204-371-1	120-12-7		0.65 mg/kg		0.579 mg/kg	0.0000579 %	✓	
18	fluoranthene	205-912-4	206-44-0		4 mg/kg		3.56 mg/kg	0.000356 %	✓	
19	pyrene	204-927-3	129-00-0		3.5 mg/kg		3.115 mg/kg	0.000312 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		2.2 mg/kg		1.958 mg/kg	0.000196 %	✓	
21	chrysene	601-048-00-0	205-923-4		2.1 mg/kg		1.869 mg/kg	0.000187 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		2.9 mg/kg		2.581 mg/kg	0.000258 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		1 mg/kg		0.89 mg/kg	0.000089 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		2.6 mg/kg		2.314 mg/kg	0.000231 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		1.5 mg/kg		1.335 mg/kg	0.000133 %	✓	
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.23 mg/kg		0.205 mg/kg	0.0000205 %	✓	
27	benzo[ghi]perylene	205-883-8	191-24-2		1.4 mg/kg		1.246 mg/kg	0.000125 %	✓	
28	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8		26 mg/kg	1.785	41.309 mg/kg	0.00413 %	✓	
Total:								0.0515 %		

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: TP103 D1-997789-16/04/2020-0.30

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

Sample details

Sample Name:	LoW Code:	
TP103 D1-997789-16/04/2020-0.30	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)
0.30-0.90 m		
Moisture content:		
14%		
(wet weight correction)		

Hazard properties

None identified

Determinands

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

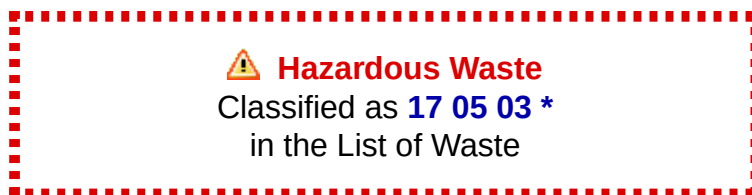
#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				44	mg/kg	1.32	49.961	mg/kg	0.005 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	cadmium { cadmium oxide }				5.4	mg/kg	1.142	5.305	mg/kg	0.00053 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				19	mg/kg	1.462	23.882	mg/kg	0.00239 %	✓	
		215-160-9	1308-38-9									
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
5	copper { dicopper oxide; copper (I) oxide }				85	mg/kg	1.126	82.302	mg/kg	0.00823 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	520	mg/kg		447.2	mg/kg	0.0447 %	✓	
	082-001-00-6											
7	mercury { mercury dichloride }				4.9	mg/kg	1.353	5.704	mg/kg	0.00057 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
8	nickel { nickel chromate }				36	mg/kg	2.976	92.145	mg/kg	0.00921 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
9	selenium { selenium compounds with the exception of cadmium selenosulfide and those specified elsewhere in this Annex }				1.2	mg/kg	2.554	2.635	mg/kg	0.000264 %	✓	
	034-002-00-8											
10	zinc { zinc oxide }				150	mg/kg	1.245	160.568	mg/kg	0.0161 %	✓	
	030-013-00-7	215-222-5	1314-13-2									
11	pH		PH		8.5	pH		8.5	pH	8.5 pH		
12	naphthalene				0.2	mg/kg		0.172	mg/kg	0.0000172 %	✓	
	601-052-00-2	202-049-5	91-20-3									
13	acenaphthylene				0.22	mg/kg		0.189	mg/kg	0.0000189 %	✓	
		205-917-1	208-96-8									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	acenaphthene	201-469-6	83-32-9		0.33 mg/kg		0.284 mg/kg	0.0000284 %	✓	
15	fluorene	201-695-5	86-73-7		0.26 mg/kg		0.224 mg/kg	0.0000224 %	✓	
16	phenanthrene	201-581-5	85-01-8		4.3 mg/kg		3.698 mg/kg	0.00037 %	✓	
17	anthracene	204-371-1	120-12-7		0.63 mg/kg		0.542 mg/kg	0.0000542 %	✓	
18	fluoranthene	205-912-4	206-44-0		3 mg/kg		2.58 mg/kg	0.000258 %	✓	
19	pyrene	204-927-3	129-00-0		2.5 mg/kg		2.15 mg/kg	0.000215 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		1.5 mg/kg		1.29 mg/kg	0.000129 %	✓	
21	chrysene	601-048-00-0	205-923-4		1.4 mg/kg		1.204 mg/kg	0.00012 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		1.7 mg/kg		1.462 mg/kg	0.000146 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.48 mg/kg		0.413 mg/kg	0.0000413 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		1.4 mg/kg		1.204 mg/kg	0.00012 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		0.79 mg/kg		0.679 mg/kg	0.0000679 %	✓	
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.14 mg/kg		0.12 mg/kg	0.000012 %	✓	
27	benzo[ghi]perylene	205-883-8	191-24-2		0.77 mg/kg		0.662 mg/kg	0.0000662 %	✓	
28	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8		29 mg/kg	1.785	44.523 mg/kg	0.00445 %	✓	
Total:								0.0932 %		

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: TP104 D2-997791-16/04/2020-0.55



Sample details

Sample Name:	LoW Code:
TP104 D2-997791-16/04/2020-0.55	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.55-0.60 m	Entry:
Moisture content:	17 05 03 * (Soil and stones containing hazardous substances)
14%	
(wet weight correction)	

Hazard properties

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 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.: 1.032%)

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 1.032%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 1.032%)

Determinands

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

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				3.1 mg/kg	1.32	3.52	mg/kg	0.000352 %	✓	
	033-003-00-0	215-481-4	1327-53-3								
2	boron { diboron trioxide; boric oxide }				<0.4 mg/kg	3.22	<1.288	mg/kg	<0.000129 %		<LOD
	005-008-00-8	215-125-8	1303-86-2								

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
3	cadmium { cadmium oxide }			1	<0.1	mg/kg	1.142	<0.114	mg/kg	<0.0000114 %		<LOD
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }			1	4.3	mg/kg	1.462	5.405	mg/kg	0.00054 %	✓	
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) oxide }			1	<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
6	copper { dicopper oxide; copper (I) oxide }			1	7.4	mg/kg	1.126	7.165	mg/kg	0.000717 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	7.5	mg/kg		6.45	mg/kg	0.000645 %	✓	
	082-001-00-6											
8	mercury { mercury dichloride }			1	<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }			1	6.8	mg/kg	2.976	17.405	mg/kg	0.00174 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }			1	<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
	034-002-00-8											
11	zinc { zinc oxide }			1	19	mg/kg	1.245	20.339	mg/kg	0.00203 %	✓	
	030-013-00-7	215-222-5	1314-13-2									
12	TPH (C6 to C40) petroleum group			1	12000	mg/kg		10320	mg/kg	1.032 %	✓	
			TPH									
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane			1	<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
14	benzene			1	<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
15	toluene			1	<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									
16	ethylbenzene			1	<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4									
17	xylene			1	<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<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]									
18	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	<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
	006-007-00-5											
19	pH			1	7.6	pH		7.6	pH	7.6 pH		
			PH									
20	naphthalene			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
21	acenaphthylene			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		205-917-1	208-96-8									
22	acenaphthene			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		201-469-6	83-32-9									
23	fluorene			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		201-695-5	86-73-7									
24	phenanthrene			1	1.9	mg/kg		1.634	mg/kg	0.000163 %	✓	
		201-581-5	85-01-8									
25	anthracene			1	0.87	mg/kg		0.748	mg/kg	0.0000748 %	✓	
		204-371-1	120-12-7									
26	fluoranthene			1	0.14	mg/kg		0.12	mg/kg	0.000012 %	✓	
		205-912-4	206-44-0									

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number								
27	pyrene		204-927-3	129-00-0		0.24 mg/kg		0.206 mg/kg	0.0000206 %		✓	
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
32	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
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
34	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
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
36	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		7.3 mg/kg	1.785	11.207 mg/kg	0.00112 %		✓	
Total:									1.04 %			

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

Classification of sample: TP104 D4-997792-16/04/2020-1.00

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

Sample details

Sample Name:	LoW Code:	
TP104 D4-997792-16/04/2020-1.00	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)
1.00-2.00 m		
Moisture content:		
15%		
(wet weight correction)		

Hazard properties

None identified

Determinands

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

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	TPH (C6 to C40) petroleum group				300 mg/kg		255 mg/kg	0.0255 %	✓	
			TPH							
2	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							
3	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
4	toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
5	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
6	xylene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<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]							
Total:								0.0255 %		

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)
<LOD	Below limit of detection
ND	Not detected

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).

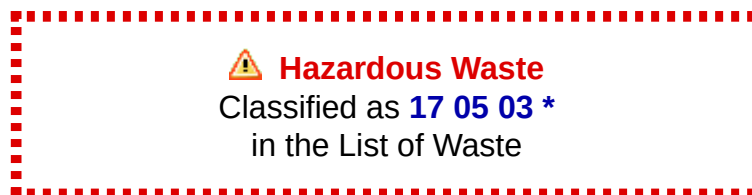
Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0255%)

Classification of sample: TP105 D1-997793-16/04/2020-0.20



Sample details

Sample Name:	LoW Code:
TP105 D1-997793-16/04/2020-0.20	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.20-0.50 m	Entry:
Moisture content:	17 05 03 * (Soil and stones containing hazardous substances)
10%	
(wet weight correction)	

Hazard properties

HP 8: Corrosive "waste which on application can cause skin corrosion"

pH; pH "Assumed to be irritant/corrosive because of pH value"

Because of determinand:

pH: (conc.: 11.8 pH)

Determinands

Moisture content: 10% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				13 mg/kg	1.32	15.448 mg/kg	0.00154 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				0.14 mg/kg	1.142	0.144 mg/kg	0.0000144 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				12 mg/kg	1.462	15.785 mg/kg	0.00158 %	✓	
		215-160-9	1308-38-9							
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
5	copper { dicopper oxide; copper (I) oxide }				30 mg/kg	1.126	30.399 mg/kg	0.00304 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	30 mg/kg		27 mg/kg	0.0027 %	✓	
	082-001-00-6									
7	mercury { mercury dichloride }				0.1 mg/kg	1.353	0.122 mg/kg	0.0000122 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
8	nickel { nickel chromate }				16 mg/kg	2.976	42.858 mg/kg	0.00429 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<LOD
	034-002-00-8									
10	zinc { zinc oxide }				37 mg/kg	1.245	41.449 mg/kg	0.00414 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
11	pH				11.8 pH		11.8 pH	11.8 pH		
			PH							

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number								
12		naphthalene				0.13 mg/kg		0.117 mg/kg	0.0000117 %	✓		
		601-052-00-2	202-049-5	91-20-3								
13	■	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD	
			205-917-1	208-96-8								
14	■	acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD	
			201-469-6	83-32-9								
15	■	fluorene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD	
			201-695-5	86-73-7								
16	■	phenanthrene				0.58 mg/kg		0.522 mg/kg	0.0000522 %	✓		
			201-581-5	85-01-8								
17	■	anthracene				0.19 mg/kg		0.171 mg/kg	0.0000171 %	✓		
			204-371-1	120-12-7								
18	■	fluoranthene				0.77 mg/kg		0.693 mg/kg	0.0000693 %	✓		
			205-912-4	206-44-0								
19	■	pyrene				0.84 mg/kg		0.756 mg/kg	0.0000756 %	✓		
			204-927-3	129-00-0								
20		benzo[a]anthracene				0.4 mg/kg		0.36 mg/kg	0.000036 %	✓		
		601-033-00-9	200-280-6	56-55-3								
21		chrysene				0.34 mg/kg		0.306 mg/kg	0.0000306 %	✓		
		601-048-00-0	205-923-4	218-01-9								
22		benzo[b]fluoranthene				0.26 mg/kg		0.234 mg/kg	0.0000234 %	✓		
		601-034-00-4	205-911-9	205-99-2								
23		benzo[k]fluoranthene				0.1 mg/kg		0.09 mg/kg	0.000009 %	✓		
		601-036-00-5	205-916-6	207-08-9								
24		benzo[a]pyrene; benzo[def]chrysene				0.21 mg/kg		0.189 mg/kg	0.0000189 %	✓		
		601-032-00-3	200-028-5	50-32-8								
25	■	indeno[123-cd]pyrene				0.22 mg/kg		0.198 mg/kg	0.0000198 %	✓		
			205-893-2	193-39-5								
26		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								
27	■	benzo[ghi]perylene				0.21 mg/kg		0.189 mg/kg	0.0000189 %	✓		
			205-883-8	191-24-2								
28	🧪	vanadium { divanadium pentaoxide; vanadium pentoxide }				19 mg/kg	1.785	30.527 mg/kg	0.00305 %	✓		
		023-001-00-8	215-239-8	1314-62-1								
Total:									0.0209 %			

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

Classification of sample: WS101 D1-996046-06/04/2020-0.2

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

Sample details

Sample Name:	LoW Code:	
WS101 D1-996046-06/04/2020-0.2	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)
0.2-0.5 m		
Moisture content:		
6%		
(wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 6% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				4.1 mg/kg	1.32	5.089 mg/kg	0.000509 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				0.21 mg/kg	1.142	0.225 mg/kg	0.0000225 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				11 mg/kg	1.462	15.112 mg/kg	0.00151 %	✓	
		215-160-9	1308-38-9							
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
5	copper { dicopper oxide; copper (I) oxide }				11 mg/kg	1.126	11.642 mg/kg	0.00116 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	25 mg/kg		23.5 mg/kg	0.00235 %	✓	
	082-001-00-6									
7	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
8	nickel { nickel chromate }				12 mg/kg	2.976	33.572 mg/kg	0.00336 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %		<LOD
	034-002-00-8									
10	zinc { zinc oxide }				37 mg/kg	1.245	43.291 mg/kg	0.00433 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
11	pH				8.8 pH		8.8 pH	8.8 pH		
12	naphthalene				0.25 mg/kg		0.235 mg/kg	0.0000235 %	✓	
	601-052-00-2	202-049-5	91-20-3							
13	acenaphthylene				0.14 mg/kg		0.132 mg/kg	0.0000132 %	✓	
		205-917-1	208-96-8							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	acenaphthene	201-469-6	83-32-9		0.63 mg/kg		0.592 mg/kg	0.0000592 %	✓	
15	fluorene	201-695-5	86-73-7		0.57 mg/kg		0.536 mg/kg	0.0000536 %	✓	
16	phenanthrene	201-581-5	85-01-8		6 mg/kg		5.64 mg/kg	0.000564 %	✓	
17	anthracene	204-371-1	120-12-7		1.5 mg/kg		1.41 mg/kg	0.000141 %	✓	
18	fluoranthene	205-912-4	206-44-0		9.6 mg/kg		9.024 mg/kg	0.000902 %	✓	
19	pyrene	204-927-3	129-00-0		7.6 mg/kg		7.144 mg/kg	0.000714 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	3.7 mg/kg		3.478 mg/kg	0.000348 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9	3.6 mg/kg		3.384 mg/kg	0.000338 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	5 mg/kg		4.7 mg/kg	0.00047 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	1.9 mg/kg		1.786 mg/kg	0.000179 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	4.6 mg/kg		4.324 mg/kg	0.000432 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		2.9 mg/kg		2.726 mg/kg	0.000273 %	✓	
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	0.46 mg/kg		0.432 mg/kg	0.0000432 %	✓	
27	benzo[ghi]perylene	205-883-8	191-24-2		2.9 mg/kg		2.726 mg/kg	0.000273 %	✓	
28	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1	12 mg/kg	1.785	20.137 mg/kg	0.00201 %	✓	
Total:								0.0202 %		

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 D3-996048-06/04/2020-2.5

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

Sample details

Sample Name:	LoW Code:	
WS101 D3-996048-06/04/2020-2.5	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)
2.5-3.0 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
	CLP index number	EC Number	CAS Number							
1	• pH				8.2 pH		8.2 pH	8.2 pH		
			PH							
Total:								0%		

Key

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

Classification of sample: WS102 D1-996049-06/04/2020-0.2

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

Sample details

Sample Name:	LoW Code:
WS102 D1-996049-06/04/2020-0.2	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.2-0.6 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
14%	
(wet weight correction)	

Hazard properties

None identified

Determinands

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

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				14 mg/kg	1.32	15.897 mg/kg	0.00159 %		✓	
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium oxide }				0.89 mg/kg	1.142	0.874 mg/kg	0.0000874 %		✓	
	048-002-00-0	215-146-2	1306-19-0								
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17 mg/kg	1.462	21.368 mg/kg	0.00214 %		✓	
		215-160-9	1308-38-9								
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %			<LOD
	024-001-00-0	215-607-8	1333-82-0								
5	copper { dicopper oxide; copper (I) oxide }				67 mg/kg	1.126	64.874 mg/kg	0.00649 %		✓	
	029-002-00-X	215-270-7	1317-39-1								
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	260 mg/kg		223.6 mg/kg	0.0224 %		✓	
	082-001-00-6										
7	mercury { mercury dichloride }				0.39 mg/kg	1.353	0.454 mg/kg	0.0000454 %		✓	
	080-010-00-X	231-299-8	7487-94-7								
8	nickel { nickel chromate }				24 mg/kg	2.976	61.43 mg/kg	0.00614 %		✓	
	028-035-00-7	238-766-5	14721-18-7								
9	selenium { selenium compounds with the exception of cadmium selenosulfide and those specified elsewhere in this Annex }				<0.2 mg/kg	2.554	<0.511 mg/kg	<0.0000511 %			<LOD
	034-002-00-8										
10	zinc { zinc oxide }				120 mg/kg	1.245	128.454 mg/kg	0.0128 %		✓	
	030-013-00-7	215-222-5	1314-13-2								
11	pH		PH		9.3 pH		9.3 pH	9.3 pH			
12	naphthalene				1.6 mg/kg		1.376 mg/kg	0.000138 %		✓	
	601-052-00-2	202-049-5	91-20-3								
13	acenaphthylene				0.46 mg/kg		0.396 mg/kg	0.0000396 %		✓	
		205-917-1	208-96-8								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	acenaphthene	201-469-6	83-32-9		1.7 mg/kg		1.462 mg/kg	0.000146 %	✓	
15	fluorene	201-695-5	86-73-7		1.1 mg/kg		0.946 mg/kg	0.0000946 %	✓	
16	phenanthrene	201-581-5	85-01-8		12 mg/kg		10.32 mg/kg	0.00103 %	✓	
17	anthracene	204-371-1	120-12-7		3 mg/kg		2.58 mg/kg	0.000258 %	✓	
18	fluoranthene	205-912-4	206-44-0		19 mg/kg		16.34 mg/kg	0.00163 %	✓	
19	pyrene	204-927-3	129-00-0		17 mg/kg		14.62 mg/kg	0.00146 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	8.3 mg/kg		7.138 mg/kg	0.000714 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9	8.4 mg/kg		7.224 mg/kg	0.000722 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	11 mg/kg		9.46 mg/kg	0.000946 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	4 mg/kg		3.44 mg/kg	0.000344 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	8.9 mg/kg		7.654 mg/kg	0.000765 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		6.4 mg/kg		5.504 mg/kg	0.00055 %	✓	
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	0.84 mg/kg		0.722 mg/kg	0.0000722 %	✓	
27	benzo[ghi]perylene	205-883-8	191-24-2		6.2 mg/kg		5.332 mg/kg	0.000533 %	✓	
28	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1	32 mg/kg	1.785	49.128 mg/kg	0.00491 %	✓	
Total:								0.0662 %		

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: WS102 D3-996051-06/04/2020-2.6



Non Hazardous Waste

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

Sample details

Sample Name:	LoW Code:
WS102 D3-996051-06/04/2020-2.6	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
2.6-3.0 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
16%	
(wet weight correction)	

Hazard properties

None identified

Determinands

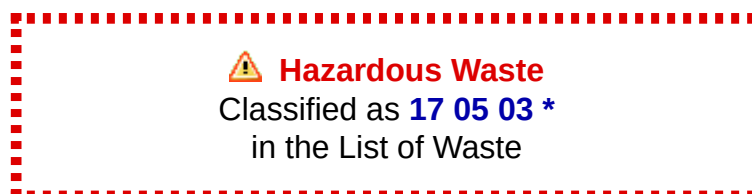
Moisture content: 16% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number							
1	•	pH				8 pH		8 pH	8pH		
				PH							
Total:									0%		

Key

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

Classification of sample: WS103 D1-996052-06/04/2020-0.1



Sample details

Sample Name:	LoW Code:	
WS103 D1-996052-06/04/2020-0.1	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 03 * (Soil and stones containing hazardous substances)
0.1-0.5 m		
Moisture content:		
7.4%		
(wet weight correction)		

Hazard properties

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 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.: 0.435%)

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.435%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.435%)

Determinands

Moisture content: 7.4% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				21 mg/kg	1.32	25.675 mg/kg	0.00257 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				0.47 mg/kg	3.22	1.401 mg/kg	0.00014 %	✓	
	005-008-00-8	215-125-8	1303-86-2							

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
3	cadmium { cadmium oxide }				0.38	mg/kg	1.142	0.402	mg/kg	0.0000402 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17	mg/kg	1.462	23.008	mg/kg	0.0023 %	✓	
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
6	copper { dicopper oxide; copper (I) oxide }				47	mg/kg	1.126	49.001	mg/kg	0.0049 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	140	mg/kg		129.64	mg/kg	0.013 %	✓	
	082-001-00-6											
8	mercury { mercury dichloride }				0.4	mg/kg	1.353	0.501	mg/kg	0.0000501 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				23	mg/kg	2.976	63.388	mg/kg	0.00634 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
	034-002-00-8											
11	zinc { zinc oxide }				69	mg/kg	1.245	79.53	mg/kg	0.00795 %	✓	
	030-013-00-7	215-222-5	1314-13-2									
12	TPH (C6 to C40) petroleum group		TPH		4700	mg/kg		4352.2	mg/kg	0.435 %	✓	
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
14	benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
15	toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									
16	ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4									
17	xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<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]									
18	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
	006-007-00-5											
19	pH		PH		8.5	pH		8.5	pH	8.5 pH		
20	naphthalene				1.7	mg/kg		1.574	mg/kg	0.000157 %	✓	
	601-052-00-2	202-049-5	91-20-3									
21	acenaphthylene				0.76	mg/kg		0.704	mg/kg	0.0000704 %	✓	
		205-917-1	208-96-8									
22	acenaphthene				8	mg/kg		7.408	mg/kg	0.000741 %	✓	
		201-469-6	83-32-9									
23	fluorene				8.2	mg/kg		7.593	mg/kg	0.000759 %	✓	
		201-695-5	86-73-7									
24	phenanthrene				99	mg/kg		91.674	mg/kg	0.00917 %	✓	
		201-581-5	85-01-8									
25	anthracene				28	mg/kg		25.928	mg/kg	0.00259 %	✓	
		204-371-1	120-12-7									
26	fluoranthene				120	mg/kg		111.12	mg/kg	0.0111 %	✓	
		205-912-4	206-44-0									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
27	pyrene				93 mg/kg		86.118 mg/kg	0.00861 %	✓	
		204-927-3	129-00-0							
28	benzo[a]anthracene				45 mg/kg		41.67 mg/kg	0.00417 %	✓	
		601-033-00-9	200-280-6							
29	chrysene				41 mg/kg		37.966 mg/kg	0.0038 %	✓	
		601-048-00-0	205-923-4							
30	benzo[b]fluoranthene				49 mg/kg		45.374 mg/kg	0.00454 %	✓	
		601-034-00-4	205-911-9							
31	benzo[k]fluoranthene				18 mg/kg		16.668 mg/kg	0.00167 %	✓	
		601-036-00-5	205-916-6							
32	benzo[a]pyrene; benzo[def]chrysene				44 mg/kg		40.744 mg/kg	0.00407 %	✓	
		601-032-00-3	200-028-5							
33	indeno[123-cd]pyrene				220 mg/kg		203.72 mg/kg	0.0204 %	✓	
			193-39-5							
34	dibenz[a,h]anthracene				4.8 mg/kg		4.445 mg/kg	0.000444 %	✓	
		601-041-00-2	200-181-8							
35	benzo[ghi]perylene				22 mg/kg		20.372 mg/kg	0.00204 %	✓	
			191-24-2							
36	vanadium { divanadium pentaoxide; vanadium pentoxide }				23 mg/kg	1.785	38.021 mg/kg	0.0038 %	✓	
		023-001-00-8	215-239-8							
Total:								0.551 %		

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

Classification of sample: TP105 D1-996054-06/04/2020-0.3

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

Sample details

Sample Name:	LoW Code:
TP105 D1-996054-06/04/2020-0.3	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.3-0.6 m	Entry:
Moisture content:	17 05 03 * (Soil and stones containing hazardous substances)
12%	
(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. 1A; H360Df "May damage the unborn child. Suspected of damaging fertility."

Because of determinand:

lead compounds with the exception of those specified elsewhere in this Annex: (Note 1 conc.: 0.792%)

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 determinands:

dicopper oxide; copper (I) oxide: (compound conc.: 0.951%)

lead compounds with the exception of those specified elsewhere in this Annex: (Note 1 conc.: 0.792%)

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
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				48	mg/kg	1.32	55.771	mg/kg	0.00558 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	cadmium { cadmium oxide }				<0.1	mg/kg	1.142	<0.114	mg/kg	<0.0000114 %		<LOD
	048-002-00-0	215-146-2	1306-19-0									
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				25	mg/kg	1.462	32.154	mg/kg	0.00322 %	✓	
		215-160-9	1308-38-9									
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
5	copper { dicopper oxide; copper (I) oxide }				9600	mg/kg	1.126	9511.505	mg/kg	0.951 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	9000	mg/kg		7920	mg/kg	0.792 %	✓	
	082-001-00-6											
7	mercury { mercury dichloride }				0.41	mg/kg	1.353	0.488	mg/kg	0.0000488 %	✓	
	080-010-00-X	231-299-8	7487-94-7									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
8	nickel { nickel chromate }				55 mg/kg	2.976	144.051	mg/kg	0.0144 %	✓	
	028-035-00-7	238-766-5	14721-18-7								
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.77 mg/kg	2.554	1.73	mg/kg	0.000173 %	✓	
	034-002-00-8										
10	zinc { zinc oxide }				750 mg/kg	1.245	821.511	mg/kg	0.0822 %	✓	
	030-013-00-7	215-222-5	1314-13-2								
11	pH				8.3 pH		8.3	pH	8.3 pH		
			PH								
12	naphthalene				3.6 mg/kg		3.168	mg/kg	0.000317 %	✓	
	601-052-00-2	202-049-5	91-20-3								
13	acenaphthylene				0.66 mg/kg		0.581	mg/kg	0.0000581 %	✓	
		205-917-1	208-96-8								
14	acenaphthene				4.7 mg/kg		4.136	mg/kg	0.000414 %	✓	
		201-469-6	83-32-9								
15	fluorene				2.1 mg/kg		1.848	mg/kg	0.000185 %	✓	
		201-695-5	86-73-7								
16	phenanthrene				24 mg/kg		21.12	mg/kg	0.00211 %	✓	
		201-581-5	85-01-8								
17	anthracene				6.7 mg/kg		5.896	mg/kg	0.00059 %	✓	
		204-371-1	120-12-7								
18	fluoranthene				34 mg/kg		29.92	mg/kg	0.00299 %	✓	
		205-912-4	206-44-0								
19	pyrene				26 mg/kg		22.88	mg/kg	0.00229 %	✓	
		204-927-3	129-00-0								
20	benzo[a]anthracene				13 mg/kg		11.44	mg/kg	0.00114 %	✓	
	601-033-00-9	200-280-6	56-55-3								
21	chrysene				12 mg/kg		10.56	mg/kg	0.00106 %	✓	
	601-048-00-0	205-923-4	218-01-9								
22	benzo[b]fluoranthene				16 mg/kg		14.08	mg/kg	0.00141 %	✓	
	601-034-00-4	205-911-9	205-99-2								
23	benzo[k]fluoranthene				4.8 mg/kg		4.224	mg/kg	0.000422 %	✓	
	601-036-00-5	205-916-6	207-08-9								
24	benzo[a]pyrene; benzo[def]chrysene				12 mg/kg		10.56	mg/kg	0.00106 %	✓	
	601-032-00-3	200-028-5	50-32-8								
25	indeno[123-cd]pyrene				9.2 mg/kg		8.096	mg/kg	0.00081 %	✓	
		205-893-2	193-39-5								
26	dibenz[a,h]anthracene				2.2 mg/kg		1.936	mg/kg	0.000194 %	✓	
	601-041-00-2	200-181-8	53-70-3								
27	benzo[ghi]perylene				9.5 mg/kg		8.36	mg/kg	0.000836 %	✓	
		205-883-8	191-24-2								
28	vanadium { divanadium pentaoxide; vanadium pentoxide }				29 mg/kg	1.785	45.558	mg/kg	0.00456 %	✓	
	023-001-00-8	215-239-8	1314-62-1								
Total:									1.869 %		

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	

Classification of sample: TP106 D1-996055-06/04/2020-0.2

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

Sample details

Sample Name:	LoW Code:
TP106 D1-996055-06/04/2020-0.2	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.2-0.5 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
14%	
(wet weight correction)	

Hazard properties

None identified

Determinands

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

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				23 mg/kg	1.32	26.116 mg/kg	0.00261 %		✓	
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium oxide }				<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %			<LOD
	048-002-00-0	215-146-2	1306-19-0								
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				24 mg/kg	1.462	30.167 mg/kg	0.00302 %		✓	
		215-160-9	1308-38-9								
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %			<LOD
	024-001-00-0	215-607-8	1333-82-0								
5	copper { dicopper oxide; copper (I) oxide }				260 mg/kg	1.126	251.749 mg/kg	0.0252 %		✓	
	029-002-00-X	215-270-7	1317-39-1								
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	800 mg/kg		688 mg/kg	0.0688 %		✓	
	082-001-00-6										
7	mercury { mercury dichloride }				0.9 mg/kg	1.353	1.048 mg/kg	0.000105 %		✓	
	080-010-00-X	231-299-8	7487-94-7								
8	nickel { nickel chromate }				28 mg/kg	2.976	71.668 mg/kg	0.00717 %		✓	
	028-035-00-7	238-766-5	14721-18-7								
9	selenium { selenium compounds with the exception of cadmium selenosulfide and those specified elsewhere in this Annex }				0.21 mg/kg	2.554	0.461 mg/kg	0.0000461 %		✓	
	034-002-00-8										
10	zinc { zinc oxide }				370 mg/kg	1.245	396.068 mg/kg	0.0396 %		✓	
	030-013-00-7	215-222-5	1314-13-2								
11	pH		PH		8.7 pH		8.7 pH	8.7 pH			
12	naphthalene				1 mg/kg		0.86 mg/kg	0.000086 %		✓	
	601-052-00-2	202-049-5	91-20-3								
13	acenaphthylene				0.23 mg/kg		0.198 mg/kg	0.0000198 %		✓	
		205-917-1	208-96-8								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	acenaphthene	201-469-6	83-32-9		0.97 mg/kg		0.834 mg/kg	0.0000834 %	✓	
15	fluorene	201-695-5	86-73-7		0.72 mg/kg		0.619 mg/kg	0.0000619 %	✓	
16	phenanthrene	201-581-5	85-01-8		7.9 mg/kg		6.794 mg/kg	0.000679 %	✓	
17	anthracene	204-371-1	120-12-7		2.2 mg/kg		1.892 mg/kg	0.000189 %	✓	
18	fluoranthene	205-912-4	206-44-0		13 mg/kg		11.18 mg/kg	0.00112 %	✓	
19	pyrene	204-927-3	129-00-0		11 mg/kg		9.46 mg/kg	0.000946 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		5.8 mg/kg		4.988 mg/kg	0.000499 %	✓	
21	chrysene	601-048-00-0	205-923-4		6 mg/kg		5.16 mg/kg	0.000516 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		7.9 mg/kg		6.794 mg/kg	0.000679 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		2.9 mg/kg		2.494 mg/kg	0.000249 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		6.6 mg/kg		5.676 mg/kg	0.000568 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		4.7 mg/kg		4.042 mg/kg	0.000404 %	✓	
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.67 mg/kg		0.576 mg/kg	0.0000576 %	✓	
27	benzo[ghi]perylene	205-883-8	191-24-2		4.8 mg/kg		4.128 mg/kg	0.000413 %	✓	
28	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8		31 mg/kg	1.785	47.593 mg/kg	0.00476 %	✓	
Total:								0.158 %		

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: TP107 D1-996056-06/04/2020-0.0

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

Sample details

Sample Name:	LoW Code:	
TP107 D1-996056-06/04/2020-0.0	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)
0.0-0.5 m		
Moisture content:		
16%		
(wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				28	mg/kg	1.32	31.054	mg/kg	0.00311 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	cadmium { cadmium oxide }				1.3	mg/kg	1.142	1.247	mg/kg	0.000125 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				28	mg/kg	1.462	34.376	mg/kg	0.00344 %	✓	
		215-160-9	1308-38-9									
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
5	copper { dicopper oxide; copper (I) oxide }				610	mg/kg	1.126	576.905	mg/kg	0.0577 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	390	mg/kg		327.6	mg/kg	0.0328 %	✓	
	082-001-00-6											
7	mercury { mercury dichloride }				0.79	mg/kg	1.353	0.898	mg/kg	0.0000898 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
8	nickel { nickel chromate }				49	mg/kg	2.976	122.503	mg/kg	0.0123 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
9	selenium { selenium compounds with the exception of cadmium selenosulfide and those specified elsewhere in this Annex }				0.45	mg/kg	2.554	0.965	mg/kg	0.0000965 %	✓	
	034-002-00-8											
10	zinc { zinc oxide }				700	mg/kg	1.245	731.892	mg/kg	0.0732 %	✓	
	030-013-00-7	215-222-5	1314-13-2									
11	pH		PH		8.2	pH		8.2	pH	8.2 pH		
12	naphthalene				1.6	mg/kg		1.344	mg/kg	0.000134 %	✓	
	601-052-00-2	202-049-5	91-20-3									
13	acenaphthylene				0.46	mg/kg		0.386	mg/kg	0.0000386 %	✓	
		205-917-1	208-96-8									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	acenaphthene	201-469-6	83-32-9		0.77 mg/kg		0.647 mg/kg	0.0000647 %	✓	
15	fluorene	201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
16	phenanthrene	201-581-5	85-01-8		7.3 mg/kg		6.132 mg/kg	0.000613 %	✓	
17	anthracene	204-371-1	120-12-7		1.7 mg/kg		1.428 mg/kg	0.000143 %	✓	
18	fluoranthene	205-912-4	206-44-0		15 mg/kg		12.6 mg/kg	0.00126 %	✓	
19	pyrene	204-927-3	129-00-0		12 mg/kg		10.08 mg/kg	0.00101 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	9.2 mg/kg		7.728 mg/kg	0.000773 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9	9.4 mg/kg		7.896 mg/kg	0.00079 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	18 mg/kg		15.12 mg/kg	0.00151 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	6.1 mg/kg		5.124 mg/kg	0.000512 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	13 mg/kg		10.92 mg/kg	0.00109 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		10 mg/kg		8.4 mg/kg	0.00084 %	✓	
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	2.7 mg/kg		2.268 mg/kg	0.000227 %	✓	
27	benzo[ghi]perylene	205-883-8	191-24-2		8.3 mg/kg		6.972 mg/kg	0.000697 %	✓	
28	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1	42 mg/kg	1.785	62.981 mg/kg	0.0063 %	✓	
Total:								0.199 %		

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

Appendix A: Classifier defined and non CLP determinands

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

Conversion factor: 1.462

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

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

CLP index number: 082-001-00-6

Description/Comments: Least-worst case: Lead REACH Consortium considers some lead compounds Carcinogenic category 2B

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 2 H351

Reason for additional Hazards Statement(s):

03 Jun 2015 - 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

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

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

■ 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 Chronic 1 H410 , Aquatic Acute 1 H400

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

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

■ 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: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Acute Tox. 4 H302

▪ **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: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Irrit. 2 H315

▪ **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 Chronic 1 H410 , Aquatic Acute 1 H400

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

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

CLP index number: 601-023-00-4

Description/Comments:

Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)

Additional Hazard Statement(s): Carc. 2 H351

Reason for additional Hazards Statement(s):

03 Jun 2015 - 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**

CLP index number: 006-007-00-5

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

Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)

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

Reason for additional Hazards Statement(s):

14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

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

cadmium {cadmium oxide}

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

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

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

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

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

copper {dicopper oxide; copper (I) oxide}

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

lead {lead 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.

mercury {mercury dichloride}

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

nickel {nickel chromate}

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

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

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

zinc {zinc oxide}

Worst case compound based on absence of CrVI and assumed metal oxides from a combustion, ash based source.

vanadium {divanadium pentaoxide; vanadium pentoxide}

worst case/most likely scenario

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 (edit as required)

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

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

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.1, May 2018**

HazWasteOnline Classification Engine Version: 2020.140.4302.8482 (19 May 2020)

HazWasteOnline Database: 2020.140.4302.8482 (19 May 2020)

This classification utilises the following guidance and legislation:

WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018

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 Wastes 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

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

1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010

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

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