



Ref: LO/NOR1093/003/SC

10 September 2021

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For the attention of Mr Dale Capstick

**OXFORD ROAD, MANCHESTER
TANK REMOVAL - REMEDIATION STRATEGY**

1 INTRODUCTION

SOCOTEC UK Limited (SOCOTEC) was commissioned by Kier Construction (Kier) to prepare a Remediation Strategy document for the above site following the discovery of an underground storage tank (UST) in the eastern part of the site during development works. This report, details the remedial measures to be undertaken to ensure the completed development at the Oxford Road, Manchester site is safe and suitable for use.

The site is proposed for redevelopment with a four storey extension that is situated to the rear of the existing building at 323 Oxford Road. It is understood that the building is intended to be used for post-graduate research and teaching as outlined in the Manchester City Council Planning Application number 127104/FO/2020 dated 29 July 2020. Planning Condition 10) a) relates to contaminated land and requires that a Remediation Strategy be created in the event that contamination is encountered on the site at any point prior to the occupation of the development. Furthermore, the condition states that:

'...development shall cease and/or the development shall not be occupied until a report detailing what measures, if any, are required to remediate the land (the Remediation Strategy), is submitted to and approved in writing by the City Council as local planning authority and the development shall be carried out in accordance with the agreed Remediation Strategy.'

Following discovery of the UST in August 2021 all works on site ceased and further site investigation works were carried out by SOCOTEC in the immediate vicinity of the tank to assess the extent of any contamination that may be associated with it. During these works, samples of soil were collected from a series of trial pits excavated in the vicinity of the tank. A sample of water was also collected from within the tank along with a sample of sediment found to be present at the base of the tank. Visual and olfactory evidence of contamination was noted in the Made Ground excavated from TP1 and TP2 between 0.3 m to 0.75 m below ground level (bgl), the locations of which are presented on Figure 1 in Appendix A. The results of the scheduled laboratory analysis are presented in laboratory test report 610289, which can be found in Appendix B.

This Remediation Strategy (RS) outlines the remedial works to be undertaken to address the potential impact of any soil contamination associated with the UST and reduce potential risks to human health and controlled water receptors following completion of the project. The RS should be provided to the Manchester City Council Planning Authority for approval by the Local Contaminated Land Officer prior to implementation.

This RS includes the procedures and responsibilities for validation of the works as conforming to the management framework outlined in CLR11, Model Procedures for the Management of Land Contamination (CLR, 2004). Geotechnical assessments of ground conditions, risks, remediation and verification requirements are outside of the scope of this report.

The RS should be read in conjunction with the following reports:

- Oxford Road, Manchester Waste Classification of Soil and Water Following Discovery of an Underground Storage Tank. SOCOTEC report reference LO/NOR1093/001/SC Rev00 dated August 2021.

This RS refers to measures required to ensure the final development is suitable for use and to allow the discharge of Planning Condition 10) a). Further details of the general mitigation measures and practices to be implemented during the construction phase of the project to ensure the health and safety of workers and the environment in accordance with relevant legislation such as the Health & Safety at Work Act 1974 and Construction Design and Management Regulations 2015 are outside of the scope of this report.

2 PROPOSED DEVELOPMENT

It is understood that the proposed development will comprise a four storey building extension (including basement) situated to the rear of the existing building at 323 Oxford Road. It is understood that the building will be used to accommodate post-graduate research and teaching as detailed in Planning Application reference 127104/FO/2020. On the basis of the proposed development plans provided it is understood that the building footprint will cover the entire development site boundary and that no areas of soft landscaping will be included within the development area covered by this report.

The proposed building development is shown in University of Manchester Christabel Pankhurst Institute Proposed Site drawing referenced ADP-00-00-DR-A-0902 D3 T 1 presented in Appendix A.

3 GROUND CONDITIONS

The BGS Geological Map Sheet No. 85 (Manchester) 1: 50,000 Solid & Drift published in 2011 indicates that the site sits on superficial deposits of Devensian Glacial Till underlain by sandstone of the Triassic Chester Formation.

Ground investigations carried out at the site, have confirmed the presence of Till to a maximum depth of 6.00 m below ground level (bgl), which was found to underlie Made Ground. The Chester Formation was confirmed to be present, directly below the Till to a maximum depth of 7.51 m bgl, but is anticipated to be up to 50 m in thickness.

In-situ Made Ground (MG) was found to be present across the entire site and could be divided into a shallower granular layer, which was found to overlie a deeper cohesive layer. The granular MG had been excavated prior to the SOCOTEC 2021 field work.

Both visual and olfactory evidence of contamination in the form of grey/black staining and a strong diesel or kerosene like hydrocarbon odour was also noted within the cohesive MG within TP1 and TP2 of the SOCOTEC 2021 investigation. The three exploratory holes in which visual and olfactory evidence of contamination was noted are located to the southwest of the UST.

Ground water ingress was also noted in TP1 and TP2 (SOCOTEC 2021) at 0.75 m bgl and 0.5 m bgl respectively. Given the poor condition the UST was found in, it was observed by the SOCOTEC scientist that the water observed during the investigation was likely to be perched groundwater which had potentially leaked directly from the tank.

4 ENVIRONMENTAL SETTING

The Glacial Till is considered by the Environment Agency to be a Secondary Undifferentiated Aquifer, whilst the Chester Formation is considered as a Principal Aquifer. It is important to consider them as potential pathways to more sensitive controlled waters receptors as well as receptors in their own right.

Corn Brook, an inland underground river which runs directly in to the Manchester Shipping Canal, is indicated to run roughly east to west approximately 197m north of the site. As this river is culverted, it is considered unlikely to be in hydraulic connectivity with the surrounding groundwater aquifers. Therefore, the nearest sensitive controlled waters receptor is the River Medlock approximately 850 m to the north of the site.

5 CONCEPTUAL SITE MODEL

A list of the potential contaminant linkages that will require remedial measures or additional assessment is summarised in Table 1 below.

Table 1 Source Pathway Receptor Linkages

SOURCE		PATHWAY		ON-SITE RECEPTOR	OFF-SITE RECEPTOR	REMEDIAL MEASURES
Hydrocarbon impacted soils below and around UST	→	Indoor and outdoor inhalation, dermal exposure, ingestion and inhalation of particulates / Leaching and migration within Primary Aquifers	→	Future site user / Maintenance worker (Female Adult)	Corn Brook / River Medlock	Watching brief during excavation and removal of UST and chasing out of hydrocarbon impacted soil
Other contaminants within remaining cohesive Made Ground	→	Permeation of water supply pipes	→	Future site user (Female Adult)	N/A	Use of water supply pipe material for contaminated sites to be agreed with water supply company

vapours associated with VOCs	→	Migration and accumulation in building / confined spaces	→	Buildings	N/A	Onsite screening of soils from vicinity of UST excavation with Photoionization detector (PID) and/or Ultra-violet fluorescence (UVF)
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The potential pollutant linkages described above will be managed during the development via the measures described in Section 7 below.

6 PROPOSED REMEDIATION

The remediation requirements as part of the redevelopment can be summarised as follows:

- 1) A watching brief during removal of the UST, its contents and surrounding soils. Residual soil material within the resultant tank excavation is to be assessed and any visually impacted soil is to be chased out and removed from site for off-site disposal. On site screening of soils within the base and sidewalls of the excavation following removal of the UST using PID and/or UVF.
- 2) Soil samples to be collected from the base and each sidewall of the excavation following removal of the UST to be analysed to confirm removal of impacted material.
- 3) Waste classification, transportation, storage, treatment and / or disposal of waste soils and waters in accordance with waste Duty of Care requirements.
- 4) Assessment and verification of imported aggregate for use as backfill of the tank excavation to confirm suitability for use on site.
- 5) Water supply pipe material suitable for Brownfield sites and approved by water supply company.

A Verification Report (VR) providing evidence that the remediation has been adequately carried out is required to be produced on completion of the remedial works to allow the discharge of Planning Condition 10) a). Further detail on the remedial measures and detail on the verification information required during the remedial works is provided below.

7.1 UST

A watching brief should be carried out during the removal of the UST, its contents and during the excavation of surrounding soils. The UST will require to be removed in the presence of an environmental scientist, who will direct the soil removal works from the base and sides of the tank excavation for visual inspection and sampling.

A watching brief should also be maintained by the environmental scientist during the breaking out and removal of any associated infrastructure, such as pipework or a concrete slab, which may be found following the removal of the UST. Where required by the environmental scientist, trial pits will be excavated into the underlying and surrounding soils to inspect for evidence of significant contamination.

If soils identified as significantly impacted by hydrocarbons by visual or olfactory means are encountered, these should be chased out until soils free from significant contamination are encountered. Soil samples representing the in-situ soils remaining after removal of the contaminated soil material will be obtained for laboratory analysis for validation purposes.

Assessment of the suitability of remaining in-situ soil material will initially be made by through the use of rapid turnaround techniques such as PID and / or UVF screening to help guide the extent of any further chasing out, where boundaries are not immediately obvious based on visual inspections. Samples taken from the base and sidewalls of the excavation will be screened against Commercial Generic Assessment Criteria (GCA) to confirm that the remaining soils do not pose a risk to human health.

A general watching brief should be maintained throughout the earthworks for contaminated soils, groundwater and potential asbestos. Should any further significantly impacted soils, groundwater or free phase product be identified by visual or olfactory means it should be pumped out or excavated, chased out and segregated for off-site removal as waste.

7.2 Waste Duty of Care

All soils and groundwater removed from within the vicinity of the UST as waste should be fully classified in accordance with Environment Agency WM3 guidance and records of the quantities of soils removed from site as waste including Duty of Care records (Waste Transfer and /or Hazardous Waste Consignment Notes), waste carrier licences and disposal site permits, should be maintained by Kier for inclusion in the VR.

7.3 Groundwater

Any contaminated groundwater encountered during the course of the tank removal works will need to be removed from the site and appropriately disposed of off-site.

7.4 Imported Materials

Prior to being imported to site, the materials should be approved by SOCOTEC through the review of soil source information and chemical contaminant testing results to confirm suitability for use on site. Assessment of the chemical contaminants should be against Generic Assessment Criteria (GAC) for a residential with plant uptake end use.

All recycled aggregate imported to site for use as backfill, should be WRAP Quality Protocol compliant.

7.6 Water Supply Pipes

Water supply pipes suitable for Brownfield sites, i.e. barrier pipe, should be used for the provision of water supply to the site. The specification of water supply pipe should be reviewed and approved by the water supply company and evidence provided to SOCOTEC for inclusion in the VR.

SOCOTEC trust that this report meets your requirements, but please contact us should you require clarification on any of the matters raised.

Yours faithfully

for **SOCOTEC**



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Stuart Clarke
Principal Environmental Scientist
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References

EA : 2004 : Model Procedures for the Management of Land Contamination. CLR11. Environment Agency, Bristol.

EA : 2015 : Technical Guidance Note WM3 'Waste Classification: Guidance on the classification and assessment of waste' (First Edition). Natural Resources Wales / Cyfoeth Naturiol Cymru, the Scottish Environment Protection Agency, the Environment Agency and the Northern Ireland Environment Agency.

SOCOTEC : 2021 : Oxford Road, Manchester Waste Classification of Soil and Water Following Discovery of an Underground Storage Tank. Report reference LO/NOR1093/001/SC Rev00. SOCOTEC UK Limited.

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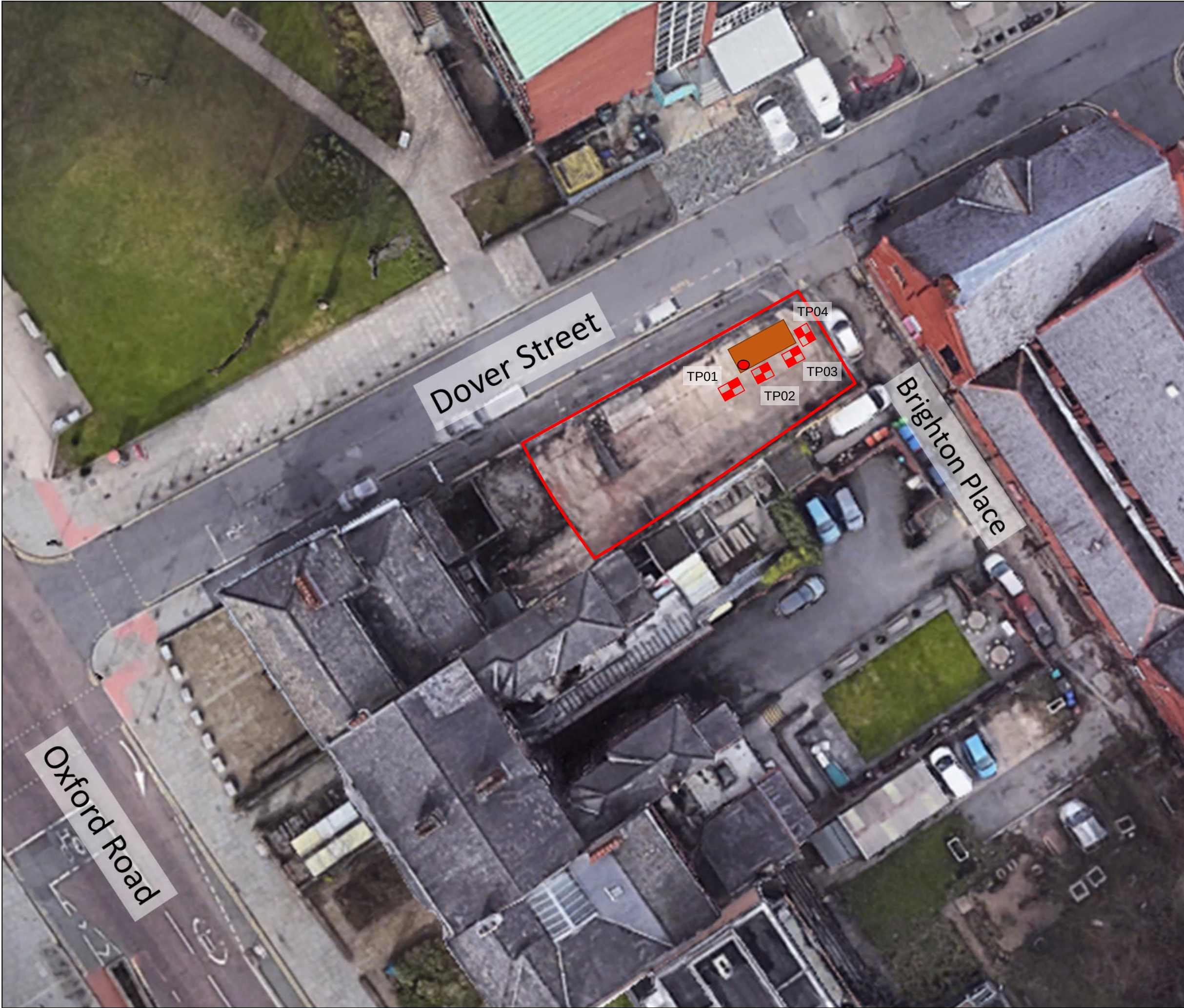
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Whilst every effort has been made to ensure the accuracy of the data supplied and any analysis interpretation derived from it, the possibility exists of variations in the ground and groundwater conditions around and between the exploratory positions. No liability can be accepted for any such variations in these conditions. Furthermore, any recommendations are specific to the development as detailed in this Report and no liability will be accepted should they be used for the design of alternative schemes without prior consultant with SOCOTEC UK Limited.

Appendix A

Figures



- Legend to symbols:
-  Trial Pit Location (SOCOTEC 2021)
 -  Buried Tank
 -  Site Boundary
 -  Location of opening in tank used for sample retrieval

Approximate Site Sketch. Not to Scale.

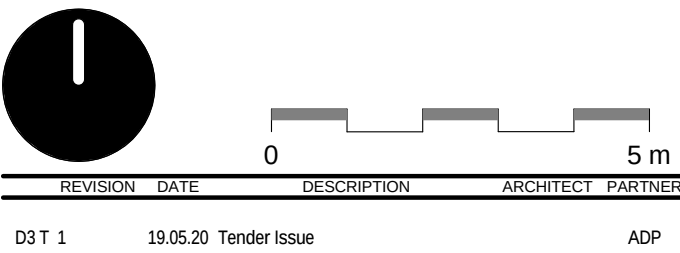
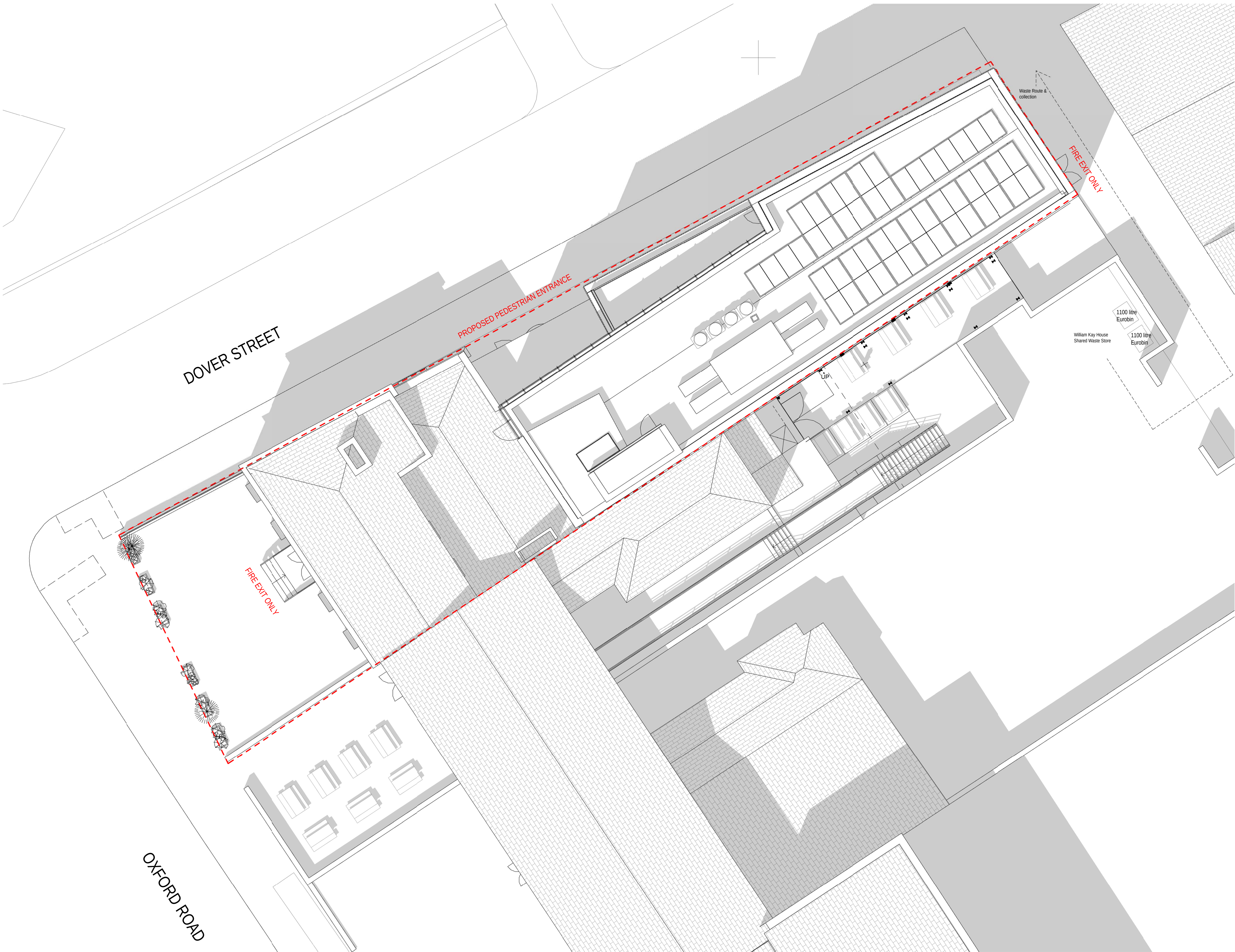
Title
Trial Pit Location Plan

Project
Oxford Road, Manchester



Project No
NOR1093

Figure No
Figure 2



CHECK ALL DIMENSIONS AND VERIFY ON SITE. REPORT ANY ERRORS OR OMISSIONS

TENDER



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JOB TITLE:
UNIVERSITY OF MANCHESTER
CHRISTABEL PANKHURST INSTITUTE

DRAWING TITLE:
PROPOSED SITE

SCALE: 1 : 100		DRAWING SHEET SIZE: A1	
JOB CODE: UMNW	DRAWING NUMBER: ADP-00-00-DR- A-0902		REVISION: D3 T 1

Appendix B
Chemical Laboratory Report



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Attention: Chris Evans

CERTIFICATE OF ANALYSIS

Date of report Generation: 23 August 2021
Customer: Socotec
Sample Delivery Group (SDG): 210813-187
Your Reference: NOR1093
Location: Oxford Rd, Manchester
Report No: 610289

This report has been revised and directly supersedes 610192 in its entirety.

We received 7 samples on Friday August 13, 2021 and 7 of these samples were scheduled for analysis which was completed on Monday August 23, 2021. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 210813-187
Location: Oxford Rd, Manchester

Client Reference: NOR1093
Order Number: CN6200

Report Number: 610289
Superseded Report: 610192

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24805195	Tank 1		0.25 - 0.25	12/08/2021
24805202	Tank 2		0.75 - 0.75	12/08/2021
24805197	TP1	ES1	0.30 - 0.50	12/08/2021
24805200	TP2	ES1	0.50 - 0.50	12/08/2021
24805198	TP3	ES1	0.30 - 0.50	12/08/2021
24805201	TP3	ES2	0.70 - 0.80	12/08/2021
24805199	TP4	ES1	0.50 - 0.50	12/08/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210813-187
Location: Oxford Rd, Manchester

Client Reference: NOR1093
Order Number: CN6200

Report Number: 610289
Superseded Report: 610192

Results Legend

X Test
N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Results Legend	Lab Sample No(s)		24805195	24805202	24805197	24805200	24805198	24805201	24805199
	Customer Sample Reference		Tank 1	Tank 2	TP1	TP2	TP3	TP3	TP4
	AGS Reference				ES1	ES1	ES1	ES2	ES1
	Depth (m)		0.25 - 0.25	0.75 - 0.75	0.30 - 0.50	0.50 - 0.50	0.30 - 0.50	0.70 - 0.80	0.50 - 0.50
	Container		11plastic (ALE221)	250 ml Glass Bottle	Vial (ALE297)	125g Glass Jar	1kg TUB	60ml Glass Jar	125g Glass Jar
	Sample Type		GW	GW	GW	S	S	S	S
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 6							
Anions by Kone (w)	All	NDPs: 0 Tests: 6							
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 6							
Boron Water Soluble	All	NDPs: 0 Tests: 6							
CEN Readings	All	NDPs: 0 Tests: 6							
Coronene	All	NDPs: 0 Tests: 6							
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 7							
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 7							
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 6							
EPH by GCxGC-FID	All	NDPs: 0 Tests: 6							
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 1							
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 1							
EPH CWG GC (S)	All	NDPs: 0 Tests: 6							
Fluoride	All	NDPs: 0 Tests: 6							
GRO by GC-FID (S)	All	NDPs: 0 Tests: 6							

24805199	TP4	ES1	0.50 - 0.50	60ml Glass Jar	S
				1kg TUB	S
X					
X					
X					
X					
X					
X					
					X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210813-187
Location: Oxford Rd, Manchester

Client Reference: NOR1093
Order Number: CN6200

Report Number: 610289
Superseded Report: 610192

Results Legend

X Test
N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Results Legend	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container										Sample Type
	24805199	TP4	ES1	0.50 - 0.50	125g Glass Jar	S													S
	24805201	TP3	ES2	0.70 - 0.80	60ml Glass Jar	S													S
	24805198	TP3	ES1	0.30 - 0.50	125g Glass Jar	S													S
	24805200	TP2	ES1	0.50 - 0.50	60ml Glass Jar	S													S
	24805197	TP1	ES1	0.30 - 0.50	125g Glass Jar	S													S
GRO by GC-FID (W)	All	NDPs: 0 Tests: 1																	
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 6																	
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1																	
Loss on Ignition in soils	All	NDPs: 0 Tests: 6																	
Mercury Dissolved	All	NDPs: 0 Tests: 7																	
Metals in solid samples by OES	All	NDPs: 0 Tests: 6																	
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 6																	
PAH by GCMS	All	NDPs: 0 Tests: 6																	
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 1																	
PCBs by GCMS	All	NDPs: 0 Tests: 6																	
pH	All	NDPs: 0 Tests: 6																	
pH Value	All	NDPs: 0 Tests: 1																	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 6																	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 7																	
Sample description	All	NDPs: 0 Tests: 6																	



CERTIFICATE OF ANALYSIS

Validated

SDG: 210813-187
Location: Oxford Rd, Manchester

Client Reference: NOR1093
Order Number: CN6200

Report Number: 610289
Superseded Report: 610192

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
24805202	Tank 2	0.75 - 0.75	Dark Brown	Sandy Silt Loam	Stones	Vegetation
24805197	TP1	0.30 - 0.50	Dark Brown	Silty Clay	Stones	None
24805200	TP2	0.50 - 0.50	Dark Brown	Sandy Silt Loam	Stones	Vegetation
24805198	TP3	0.30 - 0.50	Dark Brown	Sandy Clay	Stones	None
24805201	TP3	0.70 - 0.80	Dark Brown	Sandy Clay Loam	Stones	Vegetation
24805199	TP4	0.50 - 0.50	Dark Brown	Clay Loam	None	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

SDG: 210813-187
Location: Oxford Rd, Manchester**Client Reference:** NOR1093
Order Number: CN6200**Report Number:** 610289
Superseded Report: 610192

Results Legend			Customer Sample Ref.		Tank 1	Tank 2	TP1	TP2	TP3	TP3
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.25 - 0.25	0.75 - 0.75	0.30 - 0.50	0.50 - 0.50	0.30 - 0.50	0.70 - 0.80
M	mCERTS accredited.				Ground Water (GW)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq	Aqueous / settled sample.				12/08/2021	12/08/2021	12/08/2021	12/08/2021	12/08/2021	12/08/2021
diss.filt	Dissolved / filtered sample.				13/08/2021	13/08/2021	13/08/2021	13/08/2021	13/08/2021	13/08/2021
tot.unfilt	Total / unfiltered sample.				210813-187	210813-187	210813-187	210813-187	210813-187	210813-187
+	Subcontracted - refer to subcontractor report for accreditation status.				24805195	24805202	24805197	24805200	24805198	24805201
..	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						ES1	ES1	ES1	ES2
(F)	Trigger breach confirmed									
1-4*5@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
Arsenic (diss.filt)	<0.5 µg/l	TM152	14.7	2 #						
Barium (diss.filt)	<0.2 µg/l	TM152	54.9	2 #						
Beryllium (diss.filt)	<0.1 µg/l	TM152	<0.1	2 #						
Boron (diss.filt)	<10 µg/l	TM152	18.5	2 #						
Cadmium (diss.filt)	<0.08 µg/l	TM152	0.515	2 #						
Chromium (diss.filt)	<1 µg/l	TM152	<1	2 #						
Copper (diss.filt)	<0.3 µg/l	TM152	<0.3	2 #						
Lead (diss.filt)	<0.2 µg/l	TM152	0.264	2 #						
Nickel (diss.filt)	<0.4 µg/l	TM152	5.81	2 #						
Selenium (diss.filt)	<1 µg/l	TM152	<1	2 #						
Vanadium (diss.filt)	<1 µg/l	TM152	<1	2 #						
Zinc (diss.filt)	<1 µg/l	TM152	75.1	2 #						
Mercury (diss.filt)	<0.01 µg/l	TM183	0.0184	2 #						
Cyanide, Free	<0.05 mg/l	TM227	<0.05	2 #						
Chromium, Hexavalent	<0.03 mg/l	TM241	<0.03	#						
pH	<1 pH Units	TM256	5.77	#						
Phenol	<0.002 mg/l	TM259	0.34	2 #						
Moisture Content Ratio (% of as received sample)	%	PM024			19	22	19	14	14	
Loss on ignition	<0.7 %	TM018			9.13	7.33	11.9	3.59	4.26	
Phenol	<0.01 mg/kg	TM062 (S)			<0.01	<0.01	<0.01	<0.01	<0.01	
Organic Carbon, Total	<0.2 %	TM132			5.55	2.26	4.1	0.654	0.575	
pH	1 pH Units	TM133			8.02	8.19	7.63	8.63	8.53	
Chromium, Hexavalent	<0.6 mg/kg	TM151			<0.6	<0.6	<0.6	<0.6	<0.6	
Cyanide, Free	<1 mg/kg	TM153			<1	<1	<1	<1	<1	
PCB congener 28	<3 µg/kg	TM168			<3	<3	<3	<3	<3	
PCB congener 52	<3 µg/kg	TM168			<3	<3	<3	<3	<3	
PCB congener 101	<3 µg/kg	TM168			<3	<3	<3	<3	<3	
PCB congener 118	<3 µg/kg	TM168			<3	<3	<3	<3	<3	
PCB congener 138	<3 µg/kg	TM168			<3	<3	<3	<3	<3	
PCB congener 153	<3 µg/kg	TM168			<3	<3	<3	<3	<3	
PCB congener 180	<3 µg/kg	TM168			<3	<3	<3	<3	<3	
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168			<21	<21	<21	<21	<21	
Arsenic	<0.6 mg/kg	TM181			20.6	12.5	14.2	8.47	5.85	



CERTIFICATE OF ANALYSIS

Validated

SDG: 210813-187
Location: Oxford Rd, Manchester

Client Reference: NOR1093
Order Number: CN6200

Report Number: 610289
Superseded Report: 610192

Results Legend		Customer Sample Ref.	TP4				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50 - 0.50				
M	mCERTS accredited.		Soil/Solid (S)				
aq	Aqueous / settled sample.		12/08/2021				
diss.filt	Dissolved / filtered sample.		13/08/2021				
tot.unfilt	Total / unfiltered sample.		210813-187				
*	Subcontracted - refer to subcontractor report for accreditation status.		24805199				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		ES1				
(F)	Trigger breach confirmed						
1-4*5@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Moisture Content Ratio (% of as received sample)	%	PM024	14				
Loss on ignition	<0.7 %	TM018	4.14				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01				
Organic Carbon, Total	<0.2 %	TM132	0.674				
pH	1 pH Units	TM133	8.38				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6				
Cyanide, Free	<1 mg/kg	TM153	<1				
PCB congener 28	<3 µg/kg	TM168	<3				
PCB congener 52	<3 µg/kg	TM168	<3				
PCB congener 101	<3 µg/kg	TM168	<3				
PCB congener 118	<3 µg/kg	TM168	<3				
PCB congener 138	<3 µg/kg	TM168	<3				
PCB congener 153	<3 µg/kg	TM168	<3				
PCB congener 180	<3 µg/kg	TM168	<3				
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21				
Arsenic	<0.6 mg/kg	TM181	8.08				
Barium	<0.6 mg/kg	TM181	167				
Beryllium	<0.01 mg/kg	TM181	1.05				
Cadmium	<0.02 mg/kg	TM181	<0.02				
Chromium	<0.9 mg/kg	TM181	17.9				
Copper	<1.4 mg/kg	TM181	22.7				
Lead	<0.7 mg/kg	TM181	14.5				
Mercury	<0.1 mg/kg	TM181	<0.1				
Nickel	<0.2 mg/kg	TM181	34.2				
Selenium	<1 mg/kg	TM181	<1				
Vanadium	<0.2 mg/kg	TM181	26.6				
Zinc	<1.9 mg/kg	TM181	66.7				
ANC @ pH 4	<0.03 mol/kg	TM182	0.337				
ANC @ pH 6	<0.03 mol/kg	TM182	0.0841				
Boron, water soluble	<1 mg/kg	TM222	<1				
PAH Total 17 (inc Coronene)	<10 mg/kg	TM410	<10				
Moisture Corrected							
Coronene	<200 µg/kg	TM410	<200				
EPH Surrogate % recovery**	%	TM415	101				



CERTIFICATE OF ANALYSIS

SDG: 210813-187
Location: Oxford Rd, Manchester

Client Reference: NOR1093
Order Number: CN6200

Report Number: 610289
Superseded Report: 610192

Asbestos Identification - Solid Samples

Results Legend

ISO17025 accredited.
M mCERIS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&*S@ Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	Tank 2 0.75 - 0.75 SOLID 12/08/2021 00:00:00 13/08/2021 16:30:00 210813-187 24805202 TM048	17/08/2021	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP1ES1 0.30 - 0.50 SOLID 12/08/2021 00:00:00 13/08/2021 16:30:00 210813-187 24805197 TM048	17/08/2021	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP2ES1 0.50 - 0.50 SOLID 12/08/2021 00:00:00 13/08/2021 16:30:00 210813-187 24805200 TM048	17.08.21	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP3ES1 0.30 - 0.50 SOLID 12/08/2021 00:00:00 13/08/2021 16:30:00 210813-187 24805198 TM048	17.08.21	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP3ES2 0.70 - 0.80 SOLID 12/08/2021 00:00:00 13/08/2021 16:30:00 210813-187 24805201 TM048	17/08/2021	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP4ES1 0.50 - 0.50 SOLID 12/08/2021 00:00:00 13/08/2021 16:30:00 210813-187 24805199 TM048	17.08.21	Emily Anderton	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

Validated

SDG: 210813-187
Location: Oxford Rd, Manchester

Client Reference: NOR1093
Order Number: CN6200

Report Number: 610289
Superseded Report: 610192

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference
Mass Sample taken (kg) 0.115
Mass of dry sample (kg) 0.090
Particle Size <4mm >95%

Site Location Oxford Rd, Manchester
Natural Moisture Content (%) 28.6
Dry Matter Content (%) 77.7

Case
SDG 210813-187
Lab Sample Number(s) 24805197
Sampled Date 12-Aug-2021
Customer Sample Ref. TP1 ES1
Depth (m) 0.30 - 0.50

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	2.26
Loss on Ignition (%)	7.33
Sum of BTEX (mg/kg)	<0.8
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	8.19
ANC to pH 6 (mol/kg)	0.0427
ANC to pH 4 (mol/kg)	0.0979

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.284	<0.0002	2.84	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	<0.0003	<0.0003	<0.003	<0.003	2	50	100
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	<0.0004	<0.0004	<0.004	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.0163	<0.001	0.163	<0.01	4	50	200
Chloride	3.5	<2	35	<20	800	15000	25000
Fluoride	1.38	<0.5	13.8	<5	10	150	500
Sulphate (soluble)	4.9	<2	49	<20	1000	20000	50000
Total Dissolved Solids	99.5	<5	995	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.17	<3	41.7	<30	500	800	1000

Leach Test Information

Date Prepared 17-Aug-2021
pH (pH Units) 8.35
Conductivity (µS/cm) 127.00
Temperature (°C) 19.50
Volume Leachant (Litres) 0.875

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

23/08/2021 15:10:35

15:10:04 23/08/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210813-187
Location: Oxford Rd, Manchester

Client Reference: NOR1093
Order Number: CN6200

Report Number: 610289
Superseded Report: 610192

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.105
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Oxford Rd, Manchester
Natural Moisture Content (%)	16.1
Dry Matter Content (%)	86.2

Case	
SDG	210813-187
Lab Sample Number(s)	24805198
Sampled Date	12-Aug-2021
Customer Sample Ref.	TP3 ES1
Depth (m)	0.30 - 0.50

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.654
Loss on Ignition (%)	3.59
Sum of BTEX (mg/kg)	<0.04
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	8.63
ANC to pH 6 (mol/kg)	0.0627
ANC to pH 4 (mol/kg)	0.197

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.000665	<0.0005	0.00665	<0.005	0.5	2	25
Barium	0.0213	<0.0002	0.213	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	<0.0003	<0.0003	<0.003	<0.003	2	50	100
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.00701	<0.003	0.0701	<0.03	0.5	10	30
Nickel	<0.0004	<0.0004	<0.004	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.0283	<0.001	0.283	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	1.5	<0.5	15	<5	10	150	500
Sulphate (soluble)	22.4	<2	224	<20	1000	20000	50000
Total Dissolved Solids	120	<5	1200	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	5.07	<3	50.7	<30	500	800	1000

Leach Test Information

Date Prepared	17-Aug-2021
pH (pH Units)	8.30
Conductivity (µS/cm)	152.00
Temperature (°C)	19.70
Volume Leachant (Litres)	0.885

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

23/08/2021 15:10:35

15:10:04 23/08/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210813-187
Location: Oxford Rd, Manchester

Client Reference: NOR1093
Order Number: CN6200

Report Number: 610289
Superseded Report: 610192

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference
Mass Sample taken (kg) 0.105
Mass of dry sample (kg) 0.090
Particle Size <4mm >95%

Site Location Oxford Rd, Manchester
Natural Moisture Content (%) 16.3
Dry Matter Content (%) 86

Case
SDG 210813-187
Lab Sample Number(s) 24805199
Sampled Date 12-Aug-2021
Customer Sample Ref. TP4 ES1
Depth (m) 0.50 - 0.50

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.674
Loss on Ignition (%)	4.14
Sum of BTEX (mg/kg)	<0.8
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	8.38
ANC to pH 6 (mol/kg)	0.0841
ANC to pH 4 (mol/kg)	0.337

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.0287	<0.0002	0.287	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	<0.0003	<0.0003	<0.003	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.00386	<0.003	0.0386	<0.03	0.5	10	30
Nickel	<0.0004	<0.0004	<0.004	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	<0.001	<0.001	<0.01	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	1.06	<0.5	10.6	<5	10	150	500
Sulphate (soluble)	10.4	<2	104	<20	1000	20000	50000
Total Dissolved Solids	110	<5	1100	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.36	<3	43.6	<30	500	800	1000

Leach Test Information

Date Prepared 17-Aug-2021
pH (pH Units) 8.27
Conductivity (µS/cm) 146.00
Temperature (°C) 19.90
Volume Leachant (Litres) 0.885

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

23/08/2021 15:10:35

15:10:04 23/08/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210813-187
Location: Oxford Rd, Manchester

Client Reference: NOR1093
Order Number: CN6200

Report Number: 610289
Superseded Report: 610192

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.111
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Oxford Rd, Manchester
Natural Moisture Content (%)	23.4
Dry Matter Content (%)	81

Case	
SDG	210813-187
Lab Sample Number(s)	24805200
Sampled Date	12-Aug-2021
Customer Sample Ref.	TP2 ES1
Depth (m)	0.50 - 0.50

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	4.1
Loss on Ignition (%)	11.9
Sum of BTEX (mg/kg)	0.148
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	57.2
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	7.63
ANC to pH 6 (mol/kg)	<0.03
ANC to pH 4 (mol/kg)	0.0667

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.000951	<0.0005	0.00951	<0.005	0.5	2	25
Barium	0.299	<0.0002	2.99	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	<0.0003	<0.0003	<0.003	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.00111	<0.0004	0.0111	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.0199	<0.001	0.199	<0.01	4	50	200
Chloride	2.8	<2	28	<20	800	15000	25000
Fluoride	0.839	<0.5	8.39	<5	10	150	500
Sulphate (soluble)	3.3	<2	33	<20	1000	20000	50000
Total Dissolved Solids	113	<5	1130	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	6.38	<3	63.8	<30	500	800	1000

Leach Test Information

Date Prepared	17-Aug-2021
pH (pH Units)	8.14
Conductivity (µS/cm)	143.00
Temperature (°C)	19.60
Volume Leachant (Litres)	0.879

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

23/08/2021 15:10:35

15:10:04 23/08/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210813-187
Location: Oxford Rd, Manchester

Client Reference: NOR1093
Order Number: CN6200

Report Number: 610289
Superseded Report: 610192

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.105
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Oxford Rd, Manchester
Natural Moisture Content (%)	16.3
Dry Matter Content (%)	86

Case	
SDG	210813-187
Lab Sample Number(s)	24805201
Sampled Date	12-Aug-2021
Customer Sample Ref.	TP3 ES2
Depth (m)	0.70 - 0.80

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.575
Loss on Ignition (%)	4.26
Sum of BTEX (mg/kg)	<0.8
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	8.53
ANC to pH 6 (mol/kg)	0.0679
ANC to pH 4 (mol/kg)	0.378

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.011	<0.0002	0.11	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	<0.0003	<0.0003	<0.003	<0.003	2	50	100
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	<0.0004	<0.0004	<0.004	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	<0.001	<0.001	<0.01	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	1.05	<0.5	10.5	<5	10	150	500
Sulphate (soluble)	11.9	<2	119	<20	1000	20000	50000
Total Dissolved Solids	107	<5	1070	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	3.55	<3	35.5	<30	500	800	1000

Leach Test Information

Date Prepared	17-Aug-2021
pH (pH Units)	8.35
Conductivity (µS/cm)	136.00
Temperature (°C)	19.70
Volume Leachant (Litres)	0.885

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

23/08/2021 15:10:35

15:10:04 23/08/2021



CERTIFICATE OF ANALYSIS

Validated

SDG: 210813-187
Location: Oxford Rd, Manchester

Client Reference: NOR1093
Order Number: CN6200

Report Number: 610289
Superseded Report: 610192

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		Site Location	Oxford Rd, Manchester
Mass Sample taken (kg)	0.111	Natural Moisture Content (%)	22.8
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	81.5
Particle Size <4mm	>95%		

Case	
SDG	210813-187
Lab Sample Number(s)	24805202
Sampled Date	12-Aug-2021
Customer Sample Ref.	Tank 2
Depth (m)	0.75 - 0.75

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	5.55
Loss on Ignition (%)	9.13
Sum of BTEX (mg/kg)	<0.8
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	8.02
ANC to pH 6 (mol/kg)	0.0356
ANC to pH 4 (mol/kg)	0.103

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.00572	<0.0005	0.0572	<0.005	0.5	2	25
Barium	0.0119	<0.0002	0.119	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.0177	<0.001	0.177	<0.01	0.5	10	70
Copper	0.0245	<0.0003	0.245	<0.003	2	50	100
Mercury Dissolved (CVAf)	0.0000247	<0.00001	0.000247	<0.0001	0.01	0.2	2
Molybdenum	0.0122	<0.003	0.122	<0.03	0.5	10	30
Nickel	0.00043	<0.0004	0.0043	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	0.00199	<0.001	0.0199	<0.01	0.06	0.7	5
Selenium	0.00185	<0.001	0.0185	<0.01	0.1	0.5	7
Zinc	<0.001	<0.001	<0.01	<0.01	4	50	200
Chloride	10.8	<2	108	<20	800	15000	25000
Fluoride	0.726	<0.5	7.26	<5	10	150	500
Sulphate (soluble)	36.5	<2	365	<20	1000	20000	50000
Total Dissolved Solids	240	<5	2400	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	7.2	<3	72	<30	500	800	1000

Leach Test Information

Date Prepared	17-Aug-2021
pH (pH Units)	11.35
Conductivity (µS/cm)	574.00
Temperature (°C)	19.80
Volume Leachant (Litres)	0.879

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

23/08/2021 15:10:35

15:10:04 23/08/2021



CERTIFICATE OF ANALYSIS

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SDG: 210813-187
Location: Oxford Rd, Manchester**Client Reference:** NOR1093
Order Number: CN6200**Report Number:** 610289
Superseded Report: 610192

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM182	CEN/TC 292 - WI 292046-characterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:Soil) by ICP OES.
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).



CERTIFICATE OF ANALYSIS

Validated

SDG: 210813-187
Location: Oxford Rd, Manchester

Client Reference: NOR1093
Order Number: CN6200

Report Number: 610289
Superseded Report: 610192

Test Completion Dates

Lab Sample No(s)
Customer Sample Ref.

AGS Ref.
Depth
Type

	24805195	24805202	24805197	24805200	24805198	24805201	24805199
	Tank 1	Tank 2	TP1	TP2	TP3	TP3	TP4
			ES1	ES1	ES1	ES2	ES1
	0.25 - 0.25	0.75 - 0.75	0.30 - 0.50	0.50 - 0.50	0.30 - 0.50	0.70 - 0.80	0.50 - 0.50
	Ground Water	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
ANC at pH4 and ANC at pH 6		19-Aug-2021	19-Aug-2021	18-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021
Anions by Kone (w)		19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021
Asbestos ID in Solid Samples		17-Aug-2021	17-Aug-2021	17-Aug-2021	17-Aug-2021	17-Aug-2021	17-Aug-2021
Boron Water Soluble		18-Aug-2021	18-Aug-2021	18-Aug-2021	18-Aug-2021	18-Aug-2021	18-Aug-2021
CEN 10:1 Leachate (1 Stage)		17-Aug-2021	17-Aug-2021	17-Aug-2021	17-Aug-2021	17-Aug-2021	17-Aug-2021
CEN Readings		19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021
Coronene		17-Aug-2021	20-Aug-2021	17-Aug-2021	17-Aug-2021	17-Aug-2021	20-Aug-2021
Cyanide Comp/Free/Total/Thiocyanate	17-Aug-2021	18-Aug-2021	19-Aug-2021	18-Aug-2021	18-Aug-2021	18-Aug-2021	18-Aug-2021
Dissolved Metals by ICP-MS	17-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021
Dissolved Organic/Inorganic Carbon		23-Aug-2021	23-Aug-2021	23-Aug-2021	23-Aug-2021	23-Aug-2021	23-Aug-2021
EPH by GCxGC-FID		18-Aug-2021	20-Aug-2021	18-Aug-2021	18-Aug-2021	18-Aug-2021	20-Aug-2021
EPH CWG (Aliphatic) Aqueous GC (W)	19-Aug-2021						
EPH CWG (Aromatic) Aqueous GC (W)	19-Aug-2021						
EPH CWG GC (S)		18-Aug-2021	18-Aug-2021	18-Aug-2021	18-Aug-2021	18-Aug-2021	18-Aug-2021
Fluoride		19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021
GRO by GC-FID (S)		19-Aug-2021	19-Aug-2021	18-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021
GRO by GC-FID (W)	18-Aug-2021						
Hexavalent Chromium (s)		19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021
Hexavalent Chromium (w)	17-Aug-2021						
Loss on Ignition in soils		20-Aug-2021	20-Aug-2021	20-Aug-2021	20-Aug-2021	20-Aug-2021	19-Aug-2021
Mercury Dissolved	17-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021
Metals in solid samples by OES		19-Aug-2021	18-Aug-2021	18-Aug-2021	19-Aug-2021	19-Aug-2021	18-Aug-2021
Moisture at 105C		17-Aug-2021	17-Aug-2021	17-Aug-2021	17-Aug-2021	17-Aug-2021	17-Aug-2021
PAH 16 & 17 Calc		18-Aug-2021	20-Aug-2021	18-Aug-2021	18-Aug-2021	18-Aug-2021	20-Aug-2021
PAH by GCMS		18-Aug-2021	20-Aug-2021	18-Aug-2021	18-Aug-2021	18-Aug-2021	20-Aug-2021
PAH Spec MS - Aqueous (W)	18-Aug-2021						
PCBs by GCMS		18-Aug-2021	23-Aug-2021	18-Aug-2021	18-Aug-2021	18-Aug-2021	23-Aug-2021
pH		18-Aug-2021	18-Aug-2021	18-Aug-2021	18-Aug-2021	18-Aug-2021	18-Aug-2021
pH Value	18-Aug-2021						
Phenols by HPLC (S)		18-Aug-2021	18-Aug-2021	18-Aug-2021	18-Aug-2021	18-Aug-2021	18-Aug-2021
Phenols by HPLC (W)	18-Aug-2021	20-Aug-2021	20-Aug-2021	20-Aug-2021	20-Aug-2021	20-Aug-2021	20-Aug-2021
Sample description		16-Aug-2021	16-Aug-2021	16-Aug-2021	16-Aug-2021	16-Aug-2021	16-Aug-2021
Total Dissolved Solids		19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021
Total Organic Carbon		20-Aug-2021	20-Aug-2021	20-Aug-2021	20-Aug-2021	20-Aug-2021	20-Aug-2021
TPH CWG (W)	19-Aug-2021						
TPH CWG GC (S)		19-Aug-2021	19-Aug-2021	18-Aug-2021	19-Aug-2021	19-Aug-2021	19-Aug-2021
VOC MS (S)		17-Aug-2021	17-Aug-2021	17-Aug-2021	17-Aug-2021	17-Aug-2021	17-Aug-2021
VOC MS (W)	17-Aug-2021						



CERTIFICATE OF ANALYSIS

SDG:	210813-187	Client Reference:	NOR1093	Report Number:	610289
Location:	Oxford Rd, Manchester	Order Number:	CN6200	Superseded Report:	610192

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

General

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung. Standing Committee of Analysts, *The Quantification of Asbestos in Soil* (2017).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.