CTS Group
7 - 11 Harding Street
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L24/01949/GRM - 24-42792

Project Reference - P10525 CASCID - Christie Hospital, Manchester

Analytical Test Results - Solid

Lab Reference			346673	346674	346676
Client Sample ID			-	-	-
Client Sample Location			TP106	TP107	TP101
Client Sample Type			ES	ES	ES
Client Sample Number			-	-	-
Depth - Top (m)			0.40	0.40	0.40
Depth - Bottom (m)			0.40	0.40	0.50
Date of Sampling			27/02/2024	27/02/2024	27/02/2024
Time of Sampling			-	-	-
Sample Matrix			Sand	Clay	Sand
Determinant	**Units**	**Accreditation**			
Phenanthrene	(mg/kg)	MCERTS	0.43	0.46	0.07
Pyrene	(mg/kg)	MCERTS	0.63	0.60	0.15
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	3.7	3.5	1.0
FOC	-	UKAS	0.011	0.036	0.033
Asbestos	-	UKAS	No asbestos detected	No asbestos detected	No asbestos detected

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Project Reference - P10525 CASCID - Christie Hospital, Manchester

Analytical Test Results - Chemical Analysis

Lab Reference			346673	346675	346676
Client Sample ID			-	-	-
Client Sample Location			TP106	TP102	TP101
Client Sample Type			ES	ES	ES
Client Sample Number			-	-	-
Depth - Top (m)			0.40	0.30	0.40
Depth - Bottom (m)			0.40	0.40	0.50
Date of Sampling			27/02/2024	27/02/2024	27/02/2024
Time of Sampling			-	-	-
Sample Matrix			Sand	Sand	Sand
Determinant	**Units**	**Accreditation**			
Water soluble sulphate (as SO_4)	(mg/l)	u	< 10	< 10	< 10
Acid Soluble Sulphate	(%)	u	0.02	0.02	0.02
Total Sulphur	(%)	UKAS	0.02	0.02	0.02
pH Value	pH Units	MCERTS	8.5	7.6	7.3

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Project Reference - P10525 CASCID - Christie Hospital, Manchester

Analytical Test Results - VPH / EPH

Lab Reference			346673	346674	346676
Client Sample ID			-	-	-
Client Sample Location			TP106	TP107	TP101
Client Sample Type			ES	ES	ES
Client Sample Number			-	-	-
Depth - Top (m)			0.40	0.40	0.40
Depth - Bottom (m)			0.40	0.40	0.50
Date of Sampling			27/02/2024	27/02/2024	27/02/2024
Time of Sampling			-	-	-
Sample Matrix			Sand	Clay	Sand
Determinant	**Units**	**Accreditation**			
Aliphatic >C_5 to C_6 [HS_MS_1D_AL]	(mg/kg)	MCERTS	< 0.06	< 0.06	< 0.06
Aliphatic >C_6 to C_8 [HS_MS_1D_AL]	(mg/kg)	MCERTS	< 0.06	< 0.06	< 0.06
Aliphatic >C_8 to C_{10} [HS_MS_1D_AL]	(mg/kg)	MCERTS	< 0.06	< 0.06	< 0.06
Aliphatic >C_{10} to C_{12} [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10
Aliphatic >C_{12} to C_{16} [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10
Aliphatic >C_{16} to C_{21} [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10
Aliphatic >C_{21} to C_{35} [EH_CU_1D_AL]	(mg/kg)	u	< 20	< 20	31
Aliphatic >C_{35} to C_{44} [EH_CU_1D_AL]	(mg/kg)	u	< 15	< 15	27
Aromatic >C_5 to C_7 [HS_MS_1D_AR]	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Aromatic >C_7 to C_8 [HS_MS_1D_AR]	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Aromatic >C_8 to C_{10} [HS_MS_1D_AR]	(mg/kg)	MCERTS	< 0.06	< 0.06	< 0.06
Aromatic >C_{10} to C_{12} [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10
Aromatic >C_{12} to C_{16} [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10
Aromatic >C_{16} to C_{21} [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10
Aromatic >C_{21} to C_{35} [EH_CU_1D_AR]	(mg/kg)	u	< 20	< 20	61
Aromatic >C_{35} to C_{44} [EH_CU_1D_AR]	(mg/kg)	u	< 15	< 15	75
Total >C_5 to C_{35} [EH_CU+HS_1D_Total]	(mg/kg)	u	< 50	< 50	92
Benzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Toluene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Ethylbenzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
m&p Xylene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
o-Xylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
MTBE	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01

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Project Reference - P10525 CASCID - Christie Hc

Analytical Test Results - VOC

Lab Reference			346673	346674	346676
Client Sample ID			-	-	-
Client Sample Location			TP106	TP107	TP101
Client Sample Type			ES	ES	ES
Client Sample Number			-	-	-
Depth - Top (m)			0.40	0.40	0.40
Depth - Bottom (m)			0.40	0.40	0.50
Date of Sampling			27/02/2024	27/02/2024	27/02/2024
Time of Sampling			-	-	-
Sample Matrix			Sand	Clay	Sand
Determinant	**Units**	**Accreditation**			
Benzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Toluene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Ethylbenzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
m&p Xylene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
o-Xylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Dichlorodifluoromethane	(mg/kg)	UKAS	< 0.05	< 0.05	< 0.05
Chloromethane	(mg/kg)	UKAS	< 0.02	< 0.02	< 0.02
Vinyl Chloride	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
Bromomethane	(mg/kg)	u	< 0.05	< 0.05	< 0.05
Chloroethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Trichlorofluoromethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,1-Dichloroethylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Dichloromethane	(mg/kg)	u	< 0.10	< 0.10	< 0.10
MTBE	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
trans-1,2,-dichloroethylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,1-Dichloroethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
2,2-Dichloropropane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
cis--1,2,-dichloroethylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Bromochloromethane	(mg/kg)	MCERTS	< 0.05	< 0.05	< 0.05
Chloroform	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,1,1-Trichloroethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,1-Dichloropropene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Carbon Tetrachloride	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,2-dichloroethane	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
Trichloroethylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,2-Dichloropropane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Dibromomethane	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
Bromodichloromethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
cis-1,2-dichloropropylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
trans-1,3-dichloropropylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,1,2-Trichloroethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,3-Dichloropropane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Tetrachloroethylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Chlorodibromomethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,2-Dibromoethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Chlorobenzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Styrene	(mg/kg)	UKAS	< 0.01	< 0.01	< 0.01
Isopropylbenzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Bromoform	(mg/kg)	MCERTS	< 0.05	< 0.05	< 0.05
1,1,2,2-Tetrachloroethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,2,3-Trichloropropane	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
n-Propylbenzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Bromobenzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,3,5-Trimethylbenzene	(mg/kg)	UKAS	< 0.01	< 0.01	< 0.01
2-chlorotoluene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
4-chlorotoluene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
tert-butylbenzene	(mg/kg)	UKAS	< 0.01	< 0.01	< 0.01
1,2,4-trimethylbenzene	(mg/kg)	UKAS	< 0.01	< 0.01	< 0.01
sec-Butylbenzene	(mg/kg)	UKAS	< 0.01	< 0.01	< 0.01
4-Isopropyltoluene (P-Cymene)	(mg/kg)	UKAS	< 0.01	< 0.01	< 0.01
1,3-Dichlorobenzene	(mg/kg)	u	< 0.01	< 0.01	< 0.01
1,4-Dichlorobenzene	(mg/kg)	u	< 0.01	< 0.01	< 0.01
n-Butylbenzene	(mg/kg)	UKAS	< 0.01	< 0.01	< 0.01
1,2-Dichlorobenzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,2-Dibromo-3-chloropropane	(mg/kg)	u	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	(mg/kg)	u	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	(mg/kg)	u	< 0.05	< 0.05	< 0.05
Naphthalene	(mg/kg)	u	< 0.05	< 0.05	< 0.05
1,2,3-Trichlorobenzene	(mg/kg)	u	< 0.05	< 0.05	< 0.05

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Project Reference - P10525 CASCID - Christie Hospital, Manchester

Certificate Of Analysis - WAC Suite

Lab Reference	346674
Client Sample ID	-
Client Sample Location	TP107
Client Sample Type	ES
Client Sample Number	-
Depth - Top (m)	0.4
Depth - Bottom (m)	0.4
Date of Sampling	27/02/2024
Time of Sampling	-
Sample Description	Brown slightly gravelly very sandy silty clay
Sample Matrix	Clay
Moisture Content (%)	23
Stone content (%)	1.7

			Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
Solid Analysis						
Total Organic Carbon	%	MCERTS	3.6	3.0	5.0	6.0
Loss on Ignition	%	UKAS	3.7	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.06	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C_{10} to C_{40}) [EH_1D_Total]	mg/kg	MCERTS	132	500	-	-
PAH	mg/kg	u	3.6	100	-	-
pH	units	MCERTS	7.9	-	> 6	-
Eluate Analysis						
Arsenic	mg/kg	u	0.14	0.50	2	25
Barium	mg/kg	u	0.07	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	< 0.01	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	< 1	800	15000	25000
Fluoride	mg/kg	u	2	10	150	500
Sulphate (as SO_4)	mg/kg	u	23	1000	20000	50000
Total Dissolved Solids	mg/kg	u	520	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	29.0	500	800	1000

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Project Reference - P10525 CASCID - Christie Hospital, Manchester

Certificate Of Analysis - WAC Suite

Lab Reference	346675
Client Sample ID	-
Client Sample Location	TP102
Client Sample Type	ES
Client Sample Number	-
Depth - Top (m)	0.3
Depth - Bottom (m)	0.4
Date of Sampling	27/02/2024
Time of Sampling	-
Sample Description	Made Ground- mottled reddish brown slightly gravelly slightly clayey silty sand with occasional brick fragments
Sample Matrix	Sand
Moisture Content (%)	18
Stone content (%)	17

			Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
Solid Analysis						
Total Organic Carbon	%	MCERTS	3.2	3.0	5.0	6.0
Loss on Ignition	%	UKAS	3.6	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.06	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C_{10} to C_{40}) [EH_1D_Total]	mg/kg	MCERTS	572	500	-	-
PAH	mg/kg	u	1.3	100	-	-
pH	units	MCERTS	7.6	-	> 6	-
Eluate Analysis						
Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	0.05	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	< 0.01	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	0.04	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	< 1	800	15000	25000
Fluoride	mg/kg	u	1	10	150	500
Sulphate (as SO_4)	mg/kg	u	24	1000	20000	50000
Total Dissolved Solids	mg/kg	u	680	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	71.0	500	800	1000

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S **L24/01949/GRM - 24-42792**

\# **Project Reference - P10525 CASCID - Christie Hospital, Manchester**

Analytical Test Results - 2:1 Leachate Suite

DE	Lab Reference			346676	346677
	Client Sample ID			-	-
	Client Sample Location			TP101	BH104
	Client Sample Type			ES	ES
	Client Sample Number			-	-
	Depth - Top (m)			0.40	1.50
	Depth - Bottom (m)			0.50	1.70
	Date of Sampling			27/02/2024	27/02/2024
	Time of Sampling			-	-
	Sample Matrix			Leachate	Leachate
	Determinant	**Units**	**Accreditation**		
EN	Boron	(mg/l)	u	0.006	0.022
EN	Calcium	(mg/l)	u	46	8.3
EN	Iron	(mg/l)	u	0.38	< 0.010
EN	Antimony	(µg/l)	u	3.3	< 2.5
EN	Arsenic	(µg/l)	u	< 3	< 3
EN	Barium	(µg/l)	u	26	28
EN	Beryllium	(µg/l)	u	< 1	< 1
EN	Boron	(µg/l)	u	6	22
SU	Cadmium (LL)	(µg/l)	u	< 0.25	< 0.25
EN	Chromium	(µg/l)	u	< 3	< 3
EN	Chromium (III)	(µg/l)	u	< 20	< 20
EN	Copper	(µg/l)	u	3	< 1
EN	Lead	(µg/l)	u	< 5	< 5
EN	Magnesium	(µg/l)	u	870	790
EN	Manganese	(µg/l)	u	< 5	21
SU	Mercury (LL)	(µg/l)	u	< 0.20	< 0.20
EN	Molydenum	(µg/l)	u	14	4.4
EN	Nickel	(µg/l)	u	< 3	< 3
EN	Selenium	(µg/l)	u	< 1	< 1
EN	Vanadium	(µg/l)	u	49.0	< 2.50
EN	Zinc	(µg/l)	u	< 5	120
EN	pH	pH Units	u	7.8	7.9
EN	Cyanide (Free)	(mg/l)	u	< 0.5	< 0.5
EN	Cyanide (Complex)	(mg/l)	u	< 0.5	< 0.5
EN	Cyanide (Total)	(mg/l)	u	< 0.5	< 0.5
EN	Chromium (Hexavalent)	(mg/l)	u	< 0.02	< 0.02
EN	Chloride	(mg/l)	u	2.4	0.72
EN	Fluoride	(mg/l)	u	0.47	0.13
EN	Sulphate (As SO_4)	(mg/l)	u	< 10	< 10
EN	Ammonium (As N)	(mg/l)	u	0.39	< 0.02
EN	Phenol	(µg/l)	u	12.9	18.3
EN	Cresols	(µg/l)	u	0.34	0.91
EN	Xylenols	(µg/l)	u	< 0.20	< 0.20
EN	Trimethyl Phenols	(µg/l)	u	< 0.50	< 0.50
EN	Phenols (Total)	(µg/l)	u	13.2	19.4

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Project Reference - P10525 CASCID - Christie Hospital, Manchester

Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
346673	-	TP106	ES	-	Mottled reddish brown gravelly slightly clayey silty sand	10	28	66
346674	-	TP107	ES	-	Brown slightly gravelly very sandy silty clay	23	1.7	81
346675	-	TP102	ES	-	Made Ground- mottled reddish brown slightly gravelly slightly clayey silty sand with occasional brick fragments	18	17	72
346676	-	TP101	ES	-	Made Ground- mottled reddish brown slightly gravelly slightly clayey silty sand with occasional brick fragments	18	13	89

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Project Reference - P10525 CASCID - Christie Hospital, Manchester

Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
346673	-	TP106	ES	-	VOC - Sample taken from container with headspace. VPH/BTEX - Sample taken from container with headspace.
346674	-	TP107	ES	-	VOC - Sample taken from container with headspace. VPH/BTEX - Sample taken from container with headspace.
346675	-	TP102	ES	-	VPH/BTEX - Sample taken from container with headspace.
346676	-	TP101	ES	-	VOC - Sample taken from container with headspace. VPH/BTEX - Sample taken from container with headspace.

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Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preperation	Test Details
ANIONSL	MS - CL - Anions by Aquakem	As received	-	Determination of Anions (inc Sulphate, chloride etc.) in leachate samples by Aquakem
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
EPHS	MS - CL - EPH in Soil	As received	Passing 10mm test sieve	Determination of Extractable Petroleum Hydrocarbons in soils via GC-MS
PCB7S	MS - CL - PCB Soils	As received	Passing 10mm test sieve	Determination of PCB's (7 congeners) in soils via GC-MS
PAHASRDS	MS - CL - PAH (As Received)	As received	Passing 10mm test sieve	Determination of Polyaromatic hydrocarbons in soil via GC-MS
CWGS	MS - CL - VPH & MS - CL - EPH	As received	Passing 10mm test sieve	Determination of TPH CWG (Volatile Petroleum Hydrocarbons and Extractable Petroleum Hydrocarbons) in soils via Headspace-GC-MS and GC-MS respectively
WACTOCS	MS - CL - TOC Eltra (WAC)	Air dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soil as part of a WAC test
TOCS	MS - CL - TOC Eltra	Air Dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soils
TPHS	MS - CL - TPH (GC-FID)	As received	Passing 10mm test sieve	Determination of Total Petroleum Hydrocarbons in soil using GC-FID
WACSKALAR	MS - CL - Phenols by Skalar (WAC)	As received	BSEN:12457 Leaching	Determination of Total Phenols within leachate as part of a WAC test using a Skalar Segmented flow analyser
VOCS	MS - CL - VOC and MBTEX	As received	Passing 10mm test sieve	Determination of VOCs (inc BTEX) in soils via Headspace-GC-MS
VPHS	MS - CL - VPH	As received	Passing 10mm test sieve	Determination of VPH in soils via Headspace-GC-MS
WSBORONS	MS - CL - WS Boron	Air dried	Passing 10mm test sieve	Determination of Water soluble Boron in soils via ICP
SKALARCNL	MS - CL - Cyanide by Skalar - Leachate	As received	BSEN:12457 Leaching	Determination of cyanide (total / free / complex) in leachates using a Skalar segmented flow analyser
SKALARCNS	MS - CL - Cyanide by Skalar	As received	Passing 10mm test sieve	Determination of cyanide (total / free / complex) in soil using a Skalar segmented flow analyser
WACDOC	MS - CL - DOC (WAC)	As received	BSEN:12457 Leaching	Determination of dissolved organic carbon in a leachate as part of a WAC test
SKALARHCL	MS - CL - Hexavalent Cr by Skalar - L	As received	BSEN:12457 Leaching	Determination of hexavalent chromium in leachate using Skalar segmented flow analyser
SKALARHCS	MS - CL - Hexavalent Chromium by Skalar	As received	Passing 10mm test sieve	Determination of hexavalent chromium in soil using Skalar segmented flow analyser
WACMETALS	MS - CL - ICP - Metals in Waters (WAC)	As received	BSEN:12457 Leaching	Determination of metals in a leachate as part of a WAC test via ICP
ICPMETL	MS - CL - ICP Metals in Waters	As received	BSEN:12457 Leaching	Determination of metals in leachates via ICP
ICPMETS	MS - CL - ICP Metals	Air dried	Passing 10mm test sieve	Determination of metals in soils via ICP
PHL	MS - CL - pH in Waters	As received	BSEN:12457 Leaching	Determination of pH in leachates using a pH probe

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Project Reference - P10525 CASCID - Christie Hospital, Manchester

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preperation	Test Details
WACPHS	MS - CL - pH in Soils (WAC)	As received	BSEN:12457 Leaching	Determination of pH in soils as part of a WAC test via pH probe
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
PHOHHPLCL	MS - CL - Phenol Waters by HPLC	As received	BSEN:12457 Leaching	Determination of speciated phenols in leachates using HPLC
PHOHHPLCS	MS - CL - Phenols by HPLC (soil)	As received	Passing 10mm test sieve	Determination of speciated phenols in soil using HPLC
WACANIONS	MS - CL - Anions by Aquakem (WAC)	As received	BSEN:12457 Leaching	Determination of sulphate, chloride and fluoride in a leachate as part of a WAC test using a Aquakem analyser
TDSL	MS-CL-Conductivity in Water(TDS by Calc)	As received	BSEN:12457 Leaching	Determination of total dissolved solids in leachates (by calculation)
ASSO4S	MS - CL - Acid Soluble Sulphate	Oven Dried	Passing 2mm test sieve	Determination of total sulphate in soils by acid extraction followed by ICP analysis
ASB	MS - AS - Asbestos	-	-	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling, analysis and clearance procedures"
ENLEACHP	BS EN 12457-2	As Received	-	Leaching in accordance with BSEN 12457-2 (10:1 Ratio)
ENLEACHP2	BS EN 12457-3	As Received	-	Leaching in accordance with BSEN 12457-3
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
SUBCON-ENV	Subcontract - ENV Lab	-	-	Subcontract testing
1377LOI	BS1377 LoI	Oven dried	Passing 2mm test sieve	Testing was in accordance with BS 1377: Part 3: 2018 + A1 :2021 Clause 6. Determination of the mass loss on ignition. Some information required by BS1377: 2016: Part 1 has not been reported. This information is available on request.
1377TS-ELT	BS1377 Total Sulphur Content by HTC	Oven dried	BS1377 : Part 1 : 2016	Total Sulphur Content testing of Soil in accordance with BS 1377 : Part 3 : 2018 + A1 : 2021 Clause 7.10 (using Eltra CS-800 Analyser)

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Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided
C - Received in inappropriate container
H - Contains headspace
T - Temperature on receipt exceeds storage temperature
R - Sample(s) received with less than 96 hours for testing to commence/complete, any result formally classed as deviating will be marked with an X against the applicable test (i.e. RX)

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
346673	-	TP106	ES	-	MS - CL - Cyanide by Skalar	RX
346673	-	TP106	ES	-	MS - CL - EPH in Soil	RX
346673	-	TP106	ES	-	MS - CL - PAH (As Received)	RX
346673	-	TP106	ES	-	MS - CL - Phenols by HPLC (soil)	RX
346673	-	TP106	ES	-	MS - CL - VOC and MBTEX	RX
346673	-	TP106	ES	-	MS - CL - VPH	RX
346673	-	TP106	ES	-	MS - CL - pH in Soils	RX
346674	-	TP107	ES	-	MS - CL - Cyanide by Skalar	RX
346674	-	TP107	ES	-	MS - CL - EPH in Soil	RX
346674	-	TP107	ES	-	MS - CL - PAH (As Received)	RX
346674	-	TP107	ES	-	MS - CL - Phenols by HPLC (soil)	RX
346674	-	TP107	ES	-	MS - CL - TPH (GC-FID)	RX
346674	-	TP107	ES	-	MS - CL - VOC and MBTEX	RX
346674	-	TP107	ES	-	MS - CL - VPH	RX
346674	-	TP107	ES	-	MS - CL - pH in Soils	RX
346674	-	TP107	ES	-	MS - CL - pH in Soils (WAC)	RX
346675	-	TP102	ES	-	MS - CL - PAH (As Received)	RX
346675	-	TP102	ES	-	MS - CL - TPH (GC-FID)	RX
346675	-	TP102	ES	-	MS - CL - VPH	RX
346675	-	TP102	ES	-	MS - CL - pH in Soils	RX
346675	-	TP102	ES	-	MS - CL - pH in Soils (WAC)	RX
346676	-	TP101	ES	-	MS - CL - Cyanide by Skalar	RX
346676	-	TP101	ES	-	MS - CL - EPH in Soil	RX
346676	-	TP101	ES	-	MS - CL - PAH (As Received)	RX
346676	-	TP101	ES	-	MS - CL - Phenols by HPLC (soil)	RX
346676	-	TP101	ES	-	MS - CL - VOC and MBTEX	RX
346676	-	TP101	ES	-	MS - CL - VPH	RX
346676	-	TP101	ES	-	MS - CL - pH in Soils	RX

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HWOL TPH Acronym Index

Acronym	Description
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics and Aromatics
AL	Aliphatics Only
AR	Aromatics Only
2D	GC-GC - Double Coil Gas Chromatography
#1	EH_Total but with humics mathmatically subtracted
#2	EH_Total but with fatty acids mathmatically subtracted
_	Operator - underscore to separate acronyms (except for +)
+	Operator to indicate cumlative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry

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GRM Development Solutions
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DE14 2WH

Analytical Test Report: L24/02224/GRM - 24-42845

Your Project Reference:	**P10525 CASCID - Christie Hospital, Manchester**		
Your Order Number:	P10525	Samples Received / Instructed:	13/03/2024 / 13/03/2024
Report Issue Number:	1	Sample Tested:	13/03 to 28/03/2024
Samples Analysed:	4 soil samples	Report issued:	28/03/2024

Signed

James Gane
Analytical Services Manager
CTS Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with CTS method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Asbestos

Please note: Where futher analaysis is required samples identified as containing asbestos are screened and tested on an as recevied basis. No correction is made for moisture content and these results are not covered by our accrediation

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

WAC Testing

Samples were leached in accordance with BS EN 12457-2: 2002.

Eluate Results are reported as L/S 10. These results have been calculated in accordance with BS EN 12457-2:2002.

Comparative values are taken from the Council Decision Annex - CRITERIA AND PROCEDURES FOR THE ACCEPTANCE OF WASTE AT LANDFILLS, (2003/33/EC).

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited, subUKAS - Subcontracted to a laboratory UKAS accredited for this test

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue: 18.03.2024

Issued by: J. Gane

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L24/02224/GRM - 24-42845

Project Reference - P10525 CASCID - Christie Hospital, Manchester

Analytical Test Results - Solid

Lab Reference			346893	346895	346896
Client Sample ID			-	-	-
Client Sample Location			BH101	BH102	TP104
Client Sample Type			ES	ES	ES
Client Sample Number			-	-	-
Depth - Top (m)			1.00	0.30	0.30
Depth - Bottom (m)			1.10	0.40	0.40
Date of Sampling			11/03/2024	11/03/2024	11/03/2024
Time of Sampling			-	-	-
Sample Matrix			Clay	Sand	Sand
Determinant	**Units**	**Accreditation**			
Antimony	(mg/kg)	u	< 3.5	< 3.5	< 3.5
Arsenic	(mg/kg)	MCERTS	< 10	18	13
Barium	(mg/kg)	MCERTS	77	240	950
Beryllium	(mg/kg)	MCERTS	0.4	1.0	0.8
Boron (w/s)	(mg/kg)	u	< 2.5	< 2.5	< 2.5
Cadmium	(mg/kg)	MCERTS	0.8	0.7	0.9
Chromium (III)	(mg/kg)	u	8.6	6.0	12
Chromium (Total)	(mg/kg)	UKAS	9.6	7.0	13
Copper	(mg/kg)	MCERTS	35	48	90
Iron	(mg/kg)	u	31000	31000	29000
Lead	(mg/kg)	MCERTS	50	130	210
Manganese	(mg/kg)	MCERTS	810	660	320
Mercury	(mg/kg)	UKAS	< 2.5	< 2.5	< 2.5
Mercury Total (low level)	(mg/kg)	u	0.1	0.1	< 0.1
Molybdenum	(mg/kg)	u	< 2.0	< 2.0	< 2.0
Nickel	(mg/kg)	MCERTS	23	17	23
Selenium	(mg/kg)	u	< 8.0	< 8.0	< 8.0
Vanadium	(mg/kg)	UKAS	25	27	33
Zinc	(mg/kg)	MCERTS	55	59	370
Phenol	(mg/kg)	MCERTS	< 0.20	< 0.20	< 0.20
Cresols	(mg/kg)	MCERTS	< 0.20	< 0.20	< 0.20
Xylenols	(mg/kg)	MCERTS	< 0.20	< 0.20	< 0.20
Trimethyl Phenols	(mg/kg)	UKAS	< 0.20	< 0.20	< 0.20
Total Phenols (via HPLC)	(mg/kg)	UKAS	< 0.80	< 0.80	< 0.80
Cyanide (Free)	(mg/kg)	u	< 1.0	< 1.0	< 1.0
Chromium (Hexavalent)	(mg/kg)	u	< 1.0	< 1.0	< 1.0
pH	pH Units	MCERTS	7.5	7.9	7.9
Sulphate (Water soluble as SO_4)	(mg/l)	u	11	10	< 10
Sulphur (Total)	(%)	UKAS	0.03	0.02	0.02
Acenaphthene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
Acenaphthylene	(mg/kg)	UKAS	< 0.02	< 0.02	< 0.02
Anthracene	(mg/kg)	UKAS	0.03	< 0.02	0.03
Benzo (a) anthracene	(mg/kg)	MCERTS	0.14	0.04	0.11
Benzo (a) pyrene	(mg/kg)	MCERTS	0.16	0.03	0.10
Benzo (b) fluoranthene	(mg/kg)	MCERTS	0.27	0.06	0.12
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	0.13	0.03	0.08
Benzo (k) fluoranthene	(mg/kg)	MCERTS	0.08	< 0.02	0.03
Chrysene	(mg/kg)	MCERTS	0.16	0.05	0.12
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	0.02	< 0.02	< 0.02

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Project Reference - P10525 CASCID - Christie Hospital, Manchester

Analytical Test Results - Solid

Lab Reference			346893	346895	346896
Client Sample ID			-	-	-
Client Sample Location			BH101	BH102	TP104
Client Sample Type			ES	ES	ES
Client Sample Number			-	-	-
Depth - Top (m)			1.00	0.30	0.30
Depth - Bottom (m)			1.10	0.40	0.40
Date of Sampling			11/03/2024	11/03/2024	11/03/2024
Time of Sampling			-	-	-
Sample Matrix			Clay	Sand	Sand
Determinant	**Units**	**Accreditation**			
Fluoranthene	(mg/kg)	MCERTS	0.20	0.07	0.19
Fluorene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	0.18	0.04	0.12
Naphthalene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
Phenanthrene	(mg/kg)	MCERTS	0.12	0.03	0.12
Pyrene	(mg/kg)	MCERTS	0.23	0.07	0.18
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	1.8	0.60	1.3
FOC	-	UKAS	0.016	0.038	0.036
Asbestos	-	UKAS	No asbestos detected	No asbestos detected	No asbestos detected

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Project Reference - P10525 CASCID - Christie Hospital, Manchester

Analytical Test Results - Chemical Analysis

Lab Reference			346894	346895	346896
Client Sample ID			-	-	-
Client Sample Location			BH101	BH102	TP104
Client Sample Type			ES	ES	ES
Client Sample Number			-	-	-
Depth - Top (m)			1.50	0.30	0.30
Depth - Bottom (m)			1.60	0.40	0.40
Date of Sampling			11/03/2024	11/03/2024	11/03/2024
Time of Sampling			-	-	-
Sample Matrix			Clay	Sand	Sand
Determinant	**Units**	**Accreditation**			
Water soluble sulphate (as SO_4)	(mg/l)	u	11	10	< 10
Acid Soluble Sulphate	(%)	u	< 0.01	0.02	0.01
Total Sulphur	(%)	UKAS	0.01	0.02	0.02
pH Value	pH Units	MCERTS	7.4	7.9	7.9

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Project Reference - P10525 CASCID - Christie Hospital, Manchester

Analytical Test Results - VPH / EPH

Lab Reference			346893	346895	346896
Client Sample ID			-	-	-
Client Sample Location			BH101	BH102	TP104
Client Sample Type			ES	ES	ES
Client Sample Number			-	-	-
Depth - Top (m)			1.00	0.30	0.30
Depth - Bottom (m)			1.10	0.40	0.40
Date of Sampling			11/03/2024	11/03/2024	11/03/2024
Time of Sampling			-	-	-
Sample Matrix			Clay	Sand	Sand
Determinant	**Units**	**Accreditation**			
Aliphatic >C_5 to C_6 [HS_MS_1D_AL]	(mg/kg)	MCERTS	< 0.06	< 0.06	< 0.06
Aliphatic >C_6 to C_8 [HS_MS_1D_AL]	(mg/kg)	MCERTS	< 0.06	< 0.06	< 0.06
Aliphatic >C_8 to C_{10} [HS_MS_1D_AL]	(mg/kg)	MCERTS	< 0.06	< 0.06	< 0.06
Aliphatic >C_{10} to C_{12} [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10
Aliphatic >C_{12} to C_{16} [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10
Aliphatic >C_{16} to C_{21} [EH_CU_1D_AL]	(mg/kg)	u	< 10	< 10	< 10
Aliphatic >C_{21} to C_{35} [EH_CU_1D_AL]	(mg/kg)	u	< 20	< 20	< 20
Aliphatic >C_{35} to C_{44} [EH_CU_1D_AL]	(mg/kg)	u	< 15	< 15	< 15
Aromatic >C_5 to C_7 [HS_MS_1D_AR]	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Aromatic >C_7 to C_8 [HS_MS_1D_AR]	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Aromatic >C_8 to C_{10} [HS_MS_1D_AR]	(mg/kg)	MCERTS	< 0.06	< 0.06	< 0.06
Aromatic >C_{10} to C_{12} [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10
Aromatic >C_{12} to C_{16} [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10
Aromatic >C_{16} to C_{21} [EH_CU_1D_AR]	(mg/kg)	u	< 10	< 10	< 10
Aromatic >C_{21} to C_{35} [EH_CU_1D_AR]	(mg/kg)	u	24	< 20	< 20
Aromatic >C_{35} to C_{44} [EH_CU_1D_AR]	(mg/kg)	u	33	22	25
Total >C_5 to C_{35} [EH_CU+HS_1D_Total]	(mg/kg)	u	< 50	< 50	< 50
Benzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Toluene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Ethylbenzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
m&p Xylene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
o-Xylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
MTBE	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01

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Project Reference - P10525 CASCID - Christie H

Analytical Test Results - VOC

Lab Reference			346893	346895	346896
Client Sample ID			-	-	-
Client Sample Location			BH101	BH102	TP104
Client Sample Type			ES	ES	ES
Client Sample Number			-	-	-
Depth - Top (m)			1.00	0.30	0.30
Depth - Bottom (m)			1.10	0.40	0.40
Date of Sampling			11/03/2024	11/03/2024	11/03/2024
Time of Sampling			-	-	-
Sample Matrix			Clay	Sand	Sand
Determinant	**Units**	**Accreditation**			
Benzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Toluene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Ethylbenzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
m&p Xylene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
o-Xylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Dichlorodifluoromethane	(mg/kg)	UKAS	< 0.05	< 0.05	< 0.05
Chloromethane	(mg/kg)	UKAS	< 0.02	< 0.02	< 0.02
Vinyl Chloride	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
Bromomethane	(mg/kg)	u	< 0.05	< 0.05	< 0.05
Chloroethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Trichlorofluoromethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,1-Dichloroethylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Dichloromethane	(mg/kg)	u	< 0.10	< 0.10	< 0.10
MTBE	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
trans-1,2,-dichloroethylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,1-Dichloroethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
2,2-Dichloropropane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
cis--1,2,-dichloroethylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Bromochloromethane	(mg/kg)	MCERTS	< 0.05	< 0.05	< 0.05
Chloroform	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,1,1-Trichloroethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,1-Dichloropropene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Carbon Tetrachloride	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,2-dichloroethane	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
Trichloroethylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,2-Dichloropropane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Dibromomethane	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
Bromodichloromethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
cis-1,2-dichloropropylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
trans-1,3-dichloropropylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,1,2-Trichloroethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,3-Dichloropropane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Tetrachloroethylene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Chlorodibromomethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,2-Dibromoethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Chlorobenzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Styrene	(mg/kg)	UKAS	< 0.01	< 0.01	< 0.01
Isopropylbenzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Bromoform	(mg/kg)	MCERTS	< 0.05	< 0.05	< 0.05
1,1,2,2-Tetrachloroethane	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,2,3-Trichloropropane	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02
n-Propylbenzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
Bromobenzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,3,5-Trimethylbenzene	(mg/kg)	UKAS	< 0.01	< 0.01	< 0.01
2-chlorotoluene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
4-chlorotoluene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
tert-butylbenzene	(mg/kg)	UKAS	< 0.01	< 0.01	< 0.01
1,2,4-trimethylbenzene	(mg/kg)	UKAS	< 0.01	< 0.01	< 0.01
sec-Butylbenzene	(mg/kg)	UKAS	< 0.01	< 0.01	< 0.01
4-Isopropyltoluene (P-Cymene)	(mg/kg)	UKAS	< 0.01	< 0.01	< 0.01
1,3-Dichlorobenzene	(mg/kg)	u	< 0.01	< 0.01	< 0.01
1,4-Dichlorobenzene	(mg/kg)	u	< 0.01	< 0.01	< 0.01
n-Butylbenzene	(mg/kg)	UKAS	< 0.01	< 0.01	< 0.01
1,2-Dichlorobenzene	(mg/kg)	MCERTS	< 0.01	< 0.01	< 0.01
1,2-Dibromo-3-chloropropane	(mg/kg)	u	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	(mg/kg)	u	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	(mg/kg)	u	< 0.05	< 0.05	< 0.05
Naphthalene	(mg/kg)	u	< 0.05	< 0.05	< 0.05
1,2,3-Trichlorobenzene	(mg/kg)	u	< 0.05	< 0.05	< 0.05

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Project Reference - P10525 CASCID - Christie Hospital, Manchester

Certificate Of Analysis - WAC Suite

Lab Reference	346893
Client Sample ID	-
Client Sample Location	BH101
Client Sample Type	ES
Client Sample Number	-
Depth - Top (m)	1
Depth - Bottom (m)	1.1
Date of Sampling	11/03/2024
Time of Sampling	-
Sample Description	Dark brown slightly gravelly sandy silty clay
Sample Matrix	Clay
Moisture Content (%)	13
Stone content (%)	12

			Determined Result	Inert Waste Landfill	Stable non reactive hazardous waste in a non hazardous landfill	Hazardous Waste Landfill
Solid Analysis						
Total Organic Carbon	%	MCERTS	1.6	3.0	5.0	6.0
Loss on Ignition	%	UKAS	2.6	-	-	10.0
BTEX	mg/kg	MCERTS	< 0.06	6.00	-	-
PCB's (7 Congeners)	mg/kg	u	< 0.028	1.00	-	-
Mineral Oil (>C_{10} to C_{40}) [EH_1D_Total]	mg/kg	MCERTS	75	500	-	-
PAH	mg/kg	u	1.8	100	-	-
pH	units	MCERTS	7.5	-	> 6	-
Eluate Analysis						
Arsenic	mg/kg	u	< 0.03	0.50	2	25
Barium	mg/kg	u	< 0.05	20	100	300
Cadmium	mg/kg	u	< 0.03	0.04	1	5
Chromium (total)	mg/kg	u	< 0.03	0.5	10	70
Copper	mg/kg	u	0.01	2.0	50	100
Mercury	mg/kg	u	< 0.01	0.01	0.2	2
Molybdenum	mg/kg	u	< 0.03	0.5	10.0	30
Nickel	mg/kg	u	< 0.03	0.4	10.0	40
Lead	mg/kg	u	< 0.05	0.5	10.0	50
Antimony	mg/kg	u	< 0.03	0.06	0.7	5
Selenium	mg/kg	u	< 0.01	0.1	0.5	7
Zinc	mg/kg	u	< 0.05	4	50	200
Chloride	mg/kg	u	66	800	15000	25000
Fluoride	mg/kg	u	6	10	150	500
Sulphate (as SO_4)	mg/kg	u	< 10	1000	20000	50000
Total Dissolved Solids	mg/kg	u	330	4000	60000	100000
Phenol Index	mg/kg	u	< 1.0	1	-	-
Dissolved Organic Carbon	mg/kg	u	26.0	500	800	1000

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S **L24/02224/GRM - 24-42845**

\# **Project Reference - P10525 CASCID - Christie Hospital, Manchester**

Analytical Test Results - 2:1 Leachate Suite

DE	Lab Reference			346895
	Client Sample ID			-
	Client Sample Location			BH102
	Client Sample Type			ES
	Client Sample Number			-
	Depth - Top (m)			0.30
	Depth - Bottom (m)			0.40
	Date of Sampling			11/03/2024
	Time of Sampling			-
	Sample Matrix			Leachate
	Determinant	**Units**	**Accreditation**	
EN	Boron	(mg/l)	u	0.005
EN	Calcium	(mg/l)	u	27
EN	Iron	(mg/l)	u	1.2
EN	Antimony	(µg/l)	u	< 2.5
EN	Arsenic	(µg/l)	u	< 3
EN	Barium	(µg/l)	u	16
EN	Beryllium	(µg/l)	u	< 1
EN	Boron	(µg/l)	u	5
SU	Cadmium (LL)	(µg/l)	u	< 0.25
EN	Chromium	(µg/l)	u	< 3
EN	Chromium (III)	(µg/l)	u	< 20
EN	Copper	(µg/l)	u	< 1
EN	Lead	(µg/l)	u	< 5
EN	Magnesium	(µg/l)	u	1600
EN	Manganese	(µg/l)	u	20
SU	Mercury (LL)	(µg/l)	u	< 0.20
EN	Molydenum	(µg/l)	u	< 2.5
EN	Nickel	(µg/l)	u	< 3
EN	Selenium	(µg/l)	u	< 1
EN	Vanadium	(µg/l)	u	20.2
EN	Zinc	(µg/l)	u	< 5
EN	pH	pH Units	u	7.9
EN	Cyanide (Free)	(mg/l)	u	< 0.5
EN	Cyanide (Complex)	(mg/l)	u	< 0.5
EN	Cyanide (Total)	(mg/l)	u	< 0.5
EN	Chromium (Hexavalent)	(mg/l)	u	< 0.02
EN	Chloride	(mg/l)	u	1.6
EN	Fluoride	(mg/l)	u	0.61
EN	Sulphate (As SO_4)	(mg/l)	u	< 10
EN	Ammonium (As N)	(mg/l)	u	< 0.02
EN	Phenol	(µg/l)	u	7.42
EN	Cresols	(µg/l)	u	< 0.20
EN	Xylenols	(µg/l)	u	< 0.20
EN	Trimethyl Phenols	(µg/l)	u	< 0.50
EN	Phenols (Total)	(µg/l)	u	7.55

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Project Reference - P10525 CASCID - Christie Hospital, Manchester

Analytical Test Results - 2:1 Leachate Suite

Lab Reference		
Client Sample ID		
Client Sample Location		
Client Sample Type		
Client Sample Number		
Depth - Top (m)		
Depth - Bottom (m)		
Date of Sampling		
Time of Sampling		
Sample Matrix		
Determinant	**Units**	**Accreditation**
Boron	(mg/l)	u
Calcium	(mg/l)	u
Iron	(mg/l)	u
Antimony	(µg/l)	u
Arsenic	(µg/l)	u
Barium	(µg/l)	u
Beryllium	(µg/l)	u
Boron	(µg/l)	u
Cadmium (LL)	(µg/l)	u
Chromium	(µg/l)	u
Chromium (III)	(µg/l)	u
Copper	(µg/l)	u
Lead	(µg/l)	u
Magnesium	(µg/l)	u
Manganese	(µg/l)	u
Mercury (LL)	(µg/l)	u
Molydenum	(µg/l)	u
Nickel	(µg/l)	u
Selenium	(µg/l)	u
Vanadium	(µg/l)	u
Zinc	(µg/l)	u
pH	pH Units	u
Cyanide (Free)	(mg/l)	u
Cyanide (Complex)	(mg/l)	u
Cyanide (Total)	(mg/l)	u
Chromium (Hexavalent)	(mg/l)	u
Chloride	(mg/l)	u
Fluoride	(mg/l)	u
Sulphate (As SO_4)	(mg/l)	u
Ammonium (As N)	(mg/l)	u
Phenol	(µg/l)	u
Cresols	(µg/l)	u
Xylenols	(µg/l)	u
Trimethyl Phenols	(µg/l)	u
Phenols (Total)	(µg/l)	u

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Project Reference - P10525 CASCID - Christie Hospital, Manchester

Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
346893	-	BH101	ES	-	Dark brown slightly gravelly sandy silty clay	13	12	67
346894	-	BH101	ES	-	Mottled brown silty clay	-	-	100
346895	-	BH102	ES	-	Dark brown clayey silty loamy sand	18	2.5	71
346896	-	TP104	ES	-	Dark brown slightly clayey silty sand with frequent brick fragments	14	< 0.1	81

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Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
346893	-	BH101	ES	-	VOC - Sample taken from container with headspace. VPH/BTEX - Sample taken from container with headspace.
346894	-	BH101	ES	-	
346895	-	BH102	ES	-	VOC - Sample taken from container with headspace. VPH/BTEX - Sample taken from container with headspace.
346896	-	TP104	ES	-	VOC - Sample taken from container with headspace. VPH/BTEX - Sample taken from container with headspace.

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Project Reference - P10525 CASCID - Christie Hospital, Manchester

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preperation	Test Details
ANIONSL	MS - CL - Anions by Aquakem	As received	-	Determination of Anions (inc Sulphate, chloride etc.) in leachate samples by Aquakem
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
EPHS	MS - CL - EPH in Soil	As received	Passing 10mm test sieve	Determination of Extractable Petroleum Hydrocarbons in soils via GC-MS
PCB7S	MS - CL - PCB Soils	As received	Passing 10mm test sieve	Determination of PCB's (7 congeners) in soils via GC-MS
PAHASRDS	MS - CL - PAH (As Received)	As received	Passing 10mm test sieve	Determination of Polyaromatic hydrocarbons in soil via GC-MS
CWGS	MS - CL - VPH & MS - CL - EPH	As received	Passing 10mm test sieve	Determination of TPH CWG (Volatile Petroleum Hydrocarbons and Extractable Petroleum Hydrocarbons) in soils via Headspace-GC-MS and GC-MS respectively
WACTOCS	MS - CL - TOC Eltra (WAC)	Air dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soil as part of a WAC test
TOCS	MS - CL - TOC Eltra	Air Dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soils
TPHS	MS - CL - TPH (GC-FID)	As received	Passing 10mm test sieve	Determination of Total Petroleum Hydrocarbons in soil using GC-FID
WACSKALAR	MS - CL - Phenols by Skalar (WAC)	As received	BSEN:12457 Leaching	Determination of Total Phenols within leachate as part of a WAC test using a Skalar Segmented flow analyser
VOCS	MS - CL - VOC and MBTEX	As received	Passing 10mm test sieve	Determination of VOCs (inc BTEX) in soils via Headspace-GC-MS
VPHS	MS - CL - VPH	As received	Passing 10mm test sieve	Determination of VPH in soils via Headspace-GC-MS
WSBORONS	MS - CL - WS Boron	Air dried	Passing 10mm test sieve	Determination of Water soluble Boron in soils via ICP
SKALARCNL	MS - CL - Cyanide by Skalar - Leachate	As received	BSEN:12457 Leaching	Determination of cyanide (total / free / complex) in leachates using a Skalar segmented flow analyser
SKALARCNS	MS - CL - Cyanide by Skalar	As received	Passing 10mm test sieve	Determination of cyanide (total / free / complex) in soil using a Skalar segmented flow analyser
WACDOC	MS - CL - DOC (WAC)	As received	BSEN:12457 Leaching	Determination of dissolved organic carbon in a leachate as part of a WAC test
SKALARHCL	MS - CL - Hexavalent Cr by Skalar - L	As received	BSEN:12457 Leaching	Determination of hexavalent chromium in leachate using Skalar segmented flow analyser
SKALARHCS	MS - CL - Hexavalent Chromium by Skalar	As received	Passing 10mm test sieve	Determination of hexavalent chromium in soil using Skalar segmented flow analyser
WACMETALS	MS - CL - ICP - Metals in Waters (WAC)	As received	BSEN:12457 Leaching	Determination of metals in a leachate as part of a WAC test via ICP
ICPMETL	MS - CL - ICP Metals in Waters	As received	BSEN:12457 Leaching	Determination of metals in leachates via ICP

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Project Reference - P10525 CASCID - Christie Hospital, Manchester

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preperation	Test Details
ICPMETS	MS - CL - ICP Metals	Air dried	Passing 10mm test sieve	Determination of metals in soils via ICP
PHL	MS - CL - pH in Waters	As received	BSEN:12457 Leaching	Determination of pH in leachates using a pH probe
WACPHS	MS - CL - pH in Soils (WAC)	As received	BSEN:12457 Leaching	Determination of pH in soils as part of a WAC test via pH probe
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
PHOHHPLCL	MS - CL - Phenol Waters by HPLC	As received	BSEN:12457 Leaching	Determination of speciated phenols in leachates using HPLC
PHOHHPLCS	MS - CL - Phenols by HPLC (soil)	As received	Passing 10mm test sieve	Determination of speciated phenols in soil using HPLC
WACANIONS	MS - CL - Anions by Aquakem (WAC)	As received	BSEN:12457 Leaching	Determination of sulphate, chloride and fluoride in a leachate as part of a WAC test using a Aquakem analyser
TDSL	MS-CL-Conductivity in Water(TDS by Calc)	As received	BSEN:12457 Leaching	Determination of total dissolved solids in leachates (by calculation)
ASSO4S	MS - CL - Acid Soluble Sulphate	Oven Dried	Passing 2mm test sieve	Determination of total sulphate in soils by acid extraction followed by ICP analysis
ASB	MS - AS - Asbestos	-	-	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling, analysis and clearance procedures"
ENLEACHP	BS EN 12457-2	As Received	-	Leaching in accordance with BSEN 12457-2 (10:1 Ratio)
ENLEACHP2	BS EN 12457-3	As Received	-	Leaching in accordance with BSEN 12457-3
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
SUBCON-ENV	Subcontract - ENV Lab	-	-	Subcontract testing
1377LOI	BS1377 LoI	Oven dried	Passing 2mm test sieve	Testing was in accordance with BS 1377: Part 3: 2018 + A1 :2021 Clause 6. Determination of the mass loss on ignition. Some information required by BS1377: 2016: Part 1 has not been reported. This information is available on request.
1377TS-ELT	BS1377 Total Sulphur Content by HTC	Oven dried	BS1377 : Part 1 : 2016	Total Sulphur Content testing of Soil in accordance with BS 1377 : Part 3 : 2018 + A1 : 2021 Clause 7.10 (using Eltra CS-800 Analyser)

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Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided
C - Received in inappropriate container
H - Contains headspace
T - Temperature on receipt exceeds storage temperature
R - Sample(s) received with less than 96 hours for testing to commence/complete, any result formally classed as deviating will be marked with an X against the applicable test (i.e. RX)

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
346893	-	BH101	ES	-	MS - CL - Phenols by HPLC (soil)	X
346895	-	BH102	ES	-	MS - CL - Phenols by HPLC (soil)	X
346896	-	TP104	ES	-	MS - CL - Phenols by HPLC (soil)	X

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HWOL TPH Acronym Index

Acronym	Description
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics and Aromatics
AL	Aliphatics Only
AR	Aromatics Only
2D	GC-GC - Double Coil Gas Chromatography
#1	EH_Total but with humics mathmatically subtracted
#2	EH_Total but with fatty acids mathmatically subtracted
_	Operator - underscore to separate acronyms (except for +)
+	Operator to indicate cumlative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry

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GRM Development Solutions
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DE14 2WH

Analytical Test Report: L24/02431/GRM - 24-43078 - Amendment A

Your Project Reference:	**P10525 CASCID Christie Hospital Manchester**		
Your Order Number:	P10525	Samples Received / Instructed:	19/03/2024 / 19/03/2024
Report Issue Number:	2	Sample Tested:	19/03 to 03/04/2024
Samples Analysed:	2 soil samples	Report issued:	05/04/2024



James Gane
Analytical Services Manager
CTS Group

Notes:

Amendment A 05/04/2024 - Report amended to include updated reporting limit

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with CTS method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Asbestos

Please note: Where futher analaysis is required samples identified as containing asbestos are screened and tested on an as recevied basis. No correction is made for moisture content and these results are not covered by our accrediation

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited, subUKAS - Subcontracted to a laboratory UKAS accredited for this test

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue: 18.03.2024

Issued by: J. Gane

Issue No: 4

Rev No: 6

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L24/02431/GRM - 24-43078 - Amendment A

Project Reference - P10525 CASCID Christie Hospital Manchester

Analytical Test Results - Solid

Lab Reference			347803
Client Sample ID			-
Client Sample Location			TP105
Client Sample Type			ES
Client Sample Number			-
Depth - Top (m)			0.50
Depth - Bottom (m)			0.50
Date of Sampling			17/03/2024
Time of Sampling			-
Sample Matrix			Sand
Determinant	**Units**	**Accreditation**	
Antimony	(mg/kg)	u	< 3.5
Arsenic	(mg/kg)	MCERTS	26
Barium	(mg/kg)	MCERTS	120
Beryllium	(mg/kg)	MCERTS	0.7
Boron (w/s)	(mg/kg)	u	< 2.5
Cadmium	(mg/kg)	MCERTS	0.7
Chromium (III)	(mg/kg)	u	5.4
Chromium (Total)	(mg/kg)	UKAS	6.4
Copper	(mg/kg)	MCERTS	63
Iron	(mg/kg)	u	34000
Lead	(mg/kg)	MCERTS	450
Manganese	(mg/kg)	MCERTS	590
Mercury	(mg/kg)	UKAS	< 2.5
Mercury (Total, Low level)	(mg/kg)	u	0.2
Molybdenum	(mg/kg)	u	2.8
Nickel	(mg/kg)	MCERTS	21
Selenium	(mg/kg)	u	< 8.0
Vanadium	(mg/kg)	UKAS	32
Zinc	(mg/kg)	MCERTS	73
Phenol	(mg/kg)	MCERTS	< 0.20
Cresols	(mg/kg)	MCERTS	< 0.20
Xylenols	(mg/kg)	MCERTS	< 0.20
Trimethyl Phenols	(mg/kg)	UKAS	< 0.20
Total Phenols (via HPLC)	(mg/kg)	UKAS	< 0.80
Cyanide (Free)	(mg/kg)	u	< 1.0
Chromium (Hexavalent)	(mg/kg)	u	< 1.0
pH	pH Units	MCERTS	7.8
Sulphate (Water soluble as SO_4)	(mg/l)	u	29
Sulphur (Total)	(%)	UKAS	0.01
Acenaphthene	(mg/kg)	MCERTS	< 0.02
Acenaphthylene	(mg/kg)	UKAS	< 0.02
Anthracene	(mg/kg)	UKAS	< 0.02
Benzo (a) anthracene	(mg/kg)	MCERTS	< 0.02
Benzo (a) pyrene	(mg/kg)	MCERTS	< 0.02
Benzo (b) fluoranthene	(mg/kg)	MCERTS	< 0.02
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	< 0.02
Benzo (k) fluoranthene	(mg/kg)	MCERTS	< 0.02
Chrysene	(mg/kg)	MCERTS	< 0.02
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	< 0.02

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L24/02431/GRM - 24-43078 - Amendment A

Project Reference - P10525 CASCID Christie Hospital Manchester

Analytical Test Results - Solid

Lab Reference			347803
Client Sample ID			-
Client Sample Location			TP105
Client Sample Type			ES
Client Sample Number			-
Depth - Top (m)			0.50
Depth - Bottom (m)			0.50
Date of Sampling			17/03/2024
Time of Sampling			-
Sample Matrix			Sand
Determinant	**Units**	**Accreditation**	
Fluoranthene	(mg/kg)	MCERTS	< 0.02
Fluorene	(mg/kg)	MCERTS	< 0.02
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	< 0.02
Naphthalene	(mg/kg)	MCERTS	< 0.02
Phenanthrene	(mg/kg)	MCERTS	< 0.02
Pyrene	(mg/kg)	MCERTS	< 0.02
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	< 0.32
FOC	-	UKAS	0.038
Asbestos	-	UKAS	No asbestos detected

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L24/02431/GRM - 24-43078 - Amendment A

Project Reference - P10525 CASCID Christie Hospital Manchester

Analytical Test Results - Chemical Analysis

Lab Reference			347802
Client Sample ID			-
Client Sample Location			TP103
Client Sample Type			ES
Client Sample Number			-
Depth - Top (m)			0.30
Depth - Bottom (m)			0.40
Date of Sampling			17/03/2024
Time of Sampling			-
Sample Matrix			Sand
Determinant	**Units**	**Accreditation**	
Water soluble sulphate (as SO_4)	(mg/l)	u	< 10
Acid Soluble Sulphate	(%)	u	0.03
Total Sulphur	(%)	UKAS	0.02
pH Value	pH Units	MCERTS	8.7

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L24/02431/GRM - 24-43078 - Amendment A

Project Reference - P10525 CASCID Christie Hospital Manchester

Analytical Test Results - VPH / EPH

Lab Reference			347803
Client Sample ID			-
Client Sample Location			TP105
Client Sample Type			ES
Client Sample Number			-
Depth - Top (m)			0.50
Depth - Bottom (m)			0.50
Date of Sampling			17/03/2024
Time of Sampling			-
Sample Matrix			Sand
Determinant	**Units**	**Accreditation**	
Aliphatic >C_5 to C_6 [HS_MS_1D_AL]	(mg/kg)	MCERTS	< 0.06
Aliphatic >C_6 to C_8 [HS_MS_1D_AL]	(mg/kg)	MCERTS	< 0.06
Aliphatic >C_8 to C_{10} [HS_MS_1D_AL]	(mg/kg)	MCERTS	< 0.06
Aliphatic >C_{10} to C_{12} [EH_CU_1D_AL]	(mg/kg)	u	< 10
Aliphatic >C_{12} to C_{16} [EH_CU_1D_AL]	(mg/kg)	u	< 10
Aliphatic >C_{16} to C_{21} [EH_CU_1D_AL]	(mg/kg)	u	< 10
Aliphatic >C_{21} to C_{35} [EH_CU_1D_AL]	(mg/kg)	u	< 20
Aliphatic >C_{35} to C_{44} [EH_CU_1D_AL]	(mg/kg)	u	< 15
Aromatic >C_5 to C_7 [HS_MS_1D_AR]	(mg/kg)	MCERTS	< 0.01
Aromatic >C_7 to C_8 [HS_MS_1D_AR]	(mg/kg)	MCERTS	< 0.01
Aromatic >C_8 to C_{10} [HS_MS_1D_AR]	(mg/kg)	MCERTS	< 0.06
Aromatic >C_{10} to C_{12} [EH_CU_1D_AR]	(mg/kg)	u	< 10
Aromatic >C_{12} to C_{16} [EH_CU_1D_AR]	(mg/kg)	u	< 10
Aromatic >C_{16} to C_{21} [EH_CU_1D_AR]	(mg/kg)	u	< 10
Aromatic >C_{21} to C_{35} [EH_CU_1D_AR]	(mg/kg)	u	< 20
Aromatic >C_{35} to C_{44} [EH_CU_1D_AR]	(mg/kg)	u	< 15
Total >C_5 to C_{35} [EH_CU+HS_1D_Total]	(mg/kg)	u	< 50
Benzene	(mg/kg)	MCERTS	< 0.01
Toluene	(mg/kg)	MCERTS	< 0.01
Ethylbenzene	(mg/kg)	MCERTS	< 0.01
m&p Xylene	(mg/kg)	MCERTS	< 0.02
o-Xylene	(mg/kg)	MCERTS	< 0.01
MTBE	(mg/kg)	MCERTS	< 0.01

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Project Reference - P10525 CASCID Christie Hospital Manchester

Analytical Test Results - VOC

Lab Reference			347803
Client Sample ID			-
Client Sample Location			TP105
Client Sample Type			ES
Client Sample Number			-
Depth - Top (m)			0.50
Depth - Bottom (m)			0.50
Date of Sampling			17/03/2024
Time of Sampling			-
Sample Matrix			Sand
Determinant	**Units**	**Accreditation**	
Benzene	(mg/kg)	MCERTS	< 0.01
Toluene	(mg/kg)	MCERTS	< 0.01
Ethylbenzene	(mg/kg)	MCERTS	< 0.01
m&p Xylene	(mg/kg)	MCERTS	< 0.02
o-Xylene	(mg/kg)	MCERTS	< 0.01
Dichlorodifluoromethane	(mg/kg)	UKAS	< 0.05
Chloromethane	(mg/kg)	UKAS	< 0.02
Vinyl Chloride	(mg/kg)	MCERTS	< 0.02
Bromomethane	(mg/kg)	u	< 0.05
Chloroethane	(mg/kg)	MCERTS	< 0.01
Trichlorofluoromethane	(mg/kg)	MCERTS	< 0.01
1,1-Dichloroethylene	(mg/kg)	MCERTS	< 0.01
Dichloromethane	(mg/kg)	u	< 0.10
MTBE	(mg/kg)	MCERTS	< 0.01
trans-1,2,-dichloroethylene	(mg/kg)	MCERTS	< 0.01
1,1-Dichloroethane	(mg/kg)	MCERTS	< 0.01
2,2-Dichloropropane	(mg/kg)	MCERTS	< 0.01
cis--1,2,-dichloroethylene	(mg/kg)	MCERTS	< 0.01
Bromochloromethane	(mg/kg)	MCERTS	< 0.05
Chloroform	(mg/kg)	MCERTS	< 0.01
1,1,1-Trichloroethane	(mg/kg)	MCERTS	< 0.01
1,1-Dichloropropene	(mg/kg)	MCERTS	< 0.01
Carbon Tetrachloride	(mg/kg)	MCERTS	< 0.01
1,2-dichloroethane	(mg/kg)	MCERTS	< 0.02
Trichloroethylene	(mg/kg)	MCERTS	< 0.01
1,2-Dichloropropane	(mg/kg)	MCERTS	< 0.01
Dibromomethane	(mg/kg)	MCERTS	< 0.02
Bromodichloromethane	(mg/kg)	MCERTS	< 0.01
cis-1,2-dichloropropylene	(mg/kg)	MCERTS	< 0.01
trans-1,3-dichloropropylene	(mg/kg)	MCERTS	< 0.01
1,1,2-Trichloroethane	(mg/kg)	MCERTS	< 0.01
1,3-Dichloropropane	(mg/kg)	MCERTS	< 0.01
Tetrachloroethylene	(mg/kg)	MCERTS	< 0.01
Chlorodibromomethane	(mg/kg)	MCERTS	< 0.01
1,2-Dibromoethane	(mg/kg)	MCERTS	< 0.01
Chlorobenzene	(mg/kg)	MCERTS	< 0.01
1,1,1,2-tetrachloroethane	(mg/kg)	MCERTS	< 0.01
Styrene	(mg/kg)	UKAS	< 0.01
Isopropylbenzene	(mg/kg)	MCERTS	< 0.01
Bromoform	(mg/kg)	MCERTS	< 0.05
1,1,2,2-Tetrachloroethane	(mg/kg)	MCERTS	< 0.01
1,2,3-Trichloropropane	(mg/kg)	MCERTS	< 0.02
n-Propylbenzene	(mg/kg)	MCERTS	< 0.01
Bromobenzene	(mg/kg)	MCERTS	< 0.01
1,3,5-Trimethylbenzene	(mg/kg)	UKAS	< 0.01
2-chlorotoluene	(mg/kg)	MCERTS	< 0.01
4-chlorotoluene	(mg/kg)	MCERTS	< 0.01
tert-butylbenzene	(mg/kg)	UKAS	< 0.01
1,2,4-trimethylbenzene	(mg/kg)	UKAS	< 0.01
sec-Butylbenzene	(mg/kg)	UKAS	< 0.01
4-Isopropyltoluene (P-Cymene)	(mg/kg)	UKAS	< 0.01
1,3-Dichlorobenzene	(mg/kg)	u	< 0.01
1,4-Dichlorobenzene	(mg/kg)	u	< 0.01
n-Butylbenzene	(mg/kg)	UKAS	< 0.01
1,2-Dichlorobenzene	(mg/kg)	MCERTS	< 0.01
1,2-Dibromo-3-chloropropane	(mg/kg)	u	< 0.05
1,2,4-Trichlorobenzene	(mg/kg)	u	< 0.05
Hexachlorobutadiene	(mg/kg)	u	< 0.05
Naphthalene	(mg/kg)	u	< 0.05

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Project Reference - P10525 CASCID Christie Hospital Manchester

Analytical Test Results - VOC

Lab Reference			347803
Client Sample ID			-
Client Sample Location			TP105
Client Sample Type			ES
Client Sample Number			-
Depth - Top (m)			0.50
Depth - Bottom (m)			0.50
Date of Sampling			17/03/2024
Time of Sampling			-
Sample Matrix			Sand
Determinant	**Units**	**Accreditation**	
1,2,3-Trichlorobenzene	(mg/kg)	u	< 0.05

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Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
347802	-	TP103	ES	-	Dark greyish brown gravelly silty sand	-	-	74
347803	-	TP105	ES	-	Brown gravelly silty sand	13	< 0.1	87

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Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
347802	-	TP103	ES	-	
347803	-	TP105	ES	-	VOC - Sample taken from container with headspace. VPH/BTEX - Sample taken from container with headspace.

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Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preperation	Test Details
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
EPHS	MS - CL - EPH in Soil	As received	Passing 10mm test sieve	Determination of Extractable Petroleum Hydrocarbons in soils via GC-MS
PAHASRDS	MS - CL - PAH (As Received)	As received	Passing 10mm test sieve	Determination of Polyaromatic hydrocarbons in soil via GC-MS
CWGS	MS - CL - VPH & MS - CL - EPH	As received	Passing 10mm test sieve	Determination of TPH CWG (Volatile Petroleum Hydrocarbons and Extractable Petroleum Hydrocarbons) in soils via Headspace-GC-MS and GC-MS respectively
TOCS	MS - CL - TOC Eltra	Air Dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soils
VOCS	MS - CL - VOC and MBTEX	As received	Passing 10mm test sieve	Determination of VOCs (inc BTEX) in soils via Headspace-GC-MS
VPHS	MS - CL - VPH	As received	Passing 10mm test sieve	Determination of VPH in soils via Headspace-GC-MS
WSBORONS	MS - CL - WS Boron	Air dried	Passing 10mm test sieve	Determination of Water soluble Boron in soils via ICP
SKALARCNS	MS - CL - Cyanide by Skalar	As received	Passing 10mm test sieve	Determination of cyanide (total / free / complex) in soil using a Skalar segmented flow analyser
SKALARHCS	MS - CL - Hexavalent Chromium by Skalar	As received	Passing 10mm test sieve	Determination of hexavalent chromium in soil using Skalar segmented flow analyser
ICPMETS	MS - CL - ICP Metals	Air dried	Passing 10mm test sieve	Determination of metals in soils via ICP
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
PHOHHPLCS	MS - CL - Phenols by HPLC (soil)	As received	Passing 10mm test sieve	Determination of speciated phenols in soil using HPLC
ASSO4S	MS - CL - Acid Soluble Sulphate	Oven Dried	Passing 2mm test sieve	Determination of total sulphate in soils by acid extraction followed by ICP analysis
ASB	MS - AS - Asbestos	-	-	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling, analysis and clearance procedures"
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
SUBCON-ENV	Subcontract - ENV Lab	-	-	Subcontract testing
1377TS-ELT	BS1377 Total Sulphur Content by HTC	Oven dried	BS1377 : Part 1 : 2016	Total Sulphur Content testing of Soil in accordance with BS 1377 : Part 3 : 2018 + A1 : 2021 Clause 7.10 (using Eltra CS-800 Analyser)

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HWOL TPH Acronym Index

Acronym	Description
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics and Aromatics
AL	Aliphatics Only
AR	Aromatics Only
2D	GC-GC - Double Coil Gas Chromatography
#1	EH_Total but with humics mathmatically subtracted
#2	EH_Total but with fatty acids mathmatically subtracted
_	Operator - underscore to separate acronyms (except for +)
+	Operator to indicate cumlative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry

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GRM Development Solutions
Laurus House
First Avenue
Centrum 100
Burton Upon Trent
DE14 2WH

Analytical Test Report: L24/02431/GRM - 24-43078

Your Project Reference:	**P10525 CASCID Christie Hospital Manchester**		
Your Order Number:	P10525	Samples Received / Instructed:	19/03/2024 / 19/03/2024
Report Issue Number:	2	Sample Tested:	19/03 to 03/04/2024
Samples Analysed:	2 soil samples	Report issued:	03/04/2024

Signed



James Gane
Analytical Services Manager
CTS Group

Notes:

General

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with CTS method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Asbestos

Please note: Where futher analaysis is required samples identified as containing asbestos are screened and tested on an as recevied basis. No correction is made for moisture content and these results are not covered by our accrediation

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited, subUKAS - Subcontracted to a laboratory UKAS accredited for this test

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

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