Our Ref C2267/21/E/3510
29th March 2022

Environmental
Geotechnical
Specialists

RGS

Consilium Academies
5th Floor
One City Approach
Albert Street Eccles
Salford
M30 0BL

Via email: Suzie.McNicholas@consilium-at.com
(cc: mark@sycamoresquaregroup.co.uk)

For the attention of Suzie McNicholas (Estates Project Manager).

Ref: Armthorpe Academy, Doncaster– Supplementary Ground Investigation and Waste Acceptance Criteria.

We thank you for your request to undertake further ground investigation and Waste Acceptance Criteria (WAC) testing on the samples taken from the above site. This letter describes the work undertaken and presents the data obtained, and supplements the data presented in the following report:

- Report on a Phase 2 Geo-environmental Investigation, produced by RGS, dated February 2022 (reference: C2267/21/E/3510).

Fieldworks

Further to your instructions, the site was visited on the 14th March 2022. Trialpits were excavated using hand-held digging tools in order to reveal natural ground and acquire suitable samples. The soils were logged in general accordance with BS5930: 2015+A1: 2020, and full descriptions are given on the logs appended to this letter.

Samples were derived from ground which is likely to be taken from the site for disposal, at the positions specified by yourself. The locations of these sampling points are shown on the attached site plan. The chemical test specimens were retained in the appropriate air tight containers within cool boxes for onward transition to the chemical laboratory.

Chemical Samples

Subsequent to inspection, the samples obtained for WAC Testing were found to include the following:

Table 1: Summary of Soil Samples

Location	Sample Depth (m)	Soil Description
TP04	0.35 – 0.4	MADE GROUND (Cream and brown very sandy subangular fine to coarse GRAVEL of dolostone brick rare pottery and ash).
TP05	0.1 – 0.25	MADE GROUND (Dark grey clayey very sandy subrounded to angular fine to coarse GRAVEL of brick sandstone and clinker).

GEOTECHNICAL ENVIRONMENTAL

Rogers Geotechnical Services Ltd
Office 1 & 2 Barncliffe Business Park,
Near Bank, Shelley, Huddersfield, HD8 8LU

Telephone 0843 50 666 87
Fax 0843 51 599 30
Company No: 5130864

Waste Acceptance Criteria

Analysis of the samples were undertaken to assess the suitability of the site material for use in a landfill. In order to achieve this, WAC testing has been undertaken to demonstrate compliance, the testing was undertaken by Eurofins Chemtest Ltd and the results of all of the chemical testing are attached. The WAC have been set as maximum limit values which must not be exceeded and should not be viewed as minimum treatment specifications for landfill. The following table has been extracted from the Environment Agency[1] and adapted to compare against the chemical test results attached to this letter.

Table 2: Landfill Waste Acceptance Criteria

Determinand	Maximum Concentration (mg/kg)	Landfill Waste Acceptance Criteria Limits			Class of Landfill Maximum
		Inert	SNRHW*	Hazardous	
Total Organic Carbon %	5.2	3	5	6	SNRHW
Loss on Ignition %	2.4	-	-	10	Inert
BTEX	< 0.010	6	-	-	Inert
PCBs (7 Congeners)	< 0.10	1	-	-	Inert
TPH (Mineral Oil)	1600	500	-	-	Exceeds Inert
Total (of 17) PAHs	300	100	-	-	Exceeds Inert
pH	8.7	-	>6	-	Inert
Acid Neutralisation Capacity	0.022	-	To be evaluated	To be evaluated	-
Limit values (mg/kg) for compliance leaching test using BS EN 12457 - 3 at L/S 10 l/kg					
As	0.012	0.5	2	25	Inert
Ba	0.13	20	100	300	Inert
Cd	< 0.00011	0.04	1	5	Inert
Cr	0.019	0.5	10	70	Inert
Cu	0.012	2	50	100	Inert
Hg	< 0.00005	0.01	0.2	2	Inert
Mo	0.045	0.5	10	30	Inert
Ni	< 0.0005	0.4	10	40	Inert
Pb	< 0.0005	0.5	10	50	Inert
Sb	<0.0011	0.06	0.7	5	Inert
Se	0.0067	0.1	0.5	7	Inert
Zn	< 0.003	4	50	200	Inert
Cl	100	800	15 000	25 000	Inert
F	4.0	10	150	500	Inert
SO_4	30	1000	20 000	50 000	Inert
Total Dissolved Solids (TDS)	880	4000	60000	100 000	Inert

[1] Guidance on sampling and testing of wastes to meet landfill waste acceptance procedures, Version 1, April 2005.

Rogers Geotechnical Services Ltd
Office 1 & 2 Barncliffe Business Park,
Near Bank, Shelley, Huddersfield, HD8 8LU

Telephone 0843 50 666 87
Fax 0843 51 599 30
Company No: 5130864

Phenol index	< 0.50	1	-	-	Inert
Dissolved Organic Carbon at own pH or pH 7.5-8.0	200	500	800	1000	Inert

*Stable non-reactive hazardous waste and non-hazardous waste co-disposed with SNRHW.

In this instance, it should be appreciated that whilst most determinants fell below the upper limits for inert WAC, total organic carbon, TPHs and Total PAHs exceeded inert levels. As such, materials to be removed from site would likely have to be taken to either a stable non-hazardous or hazardous landfill, depending on what waste code is assigned to the material. In that regard, discussions would need to be held with the landfill operator.

For further guidance, please refer to the following documents which are available on the *www.gov.uk* website:

- Environment Agency – LIT 5234 *Waste Acceptance at Landfills - Guidance on waste acceptance procedures and criteria* – November 2010.
- Environment Agency – LIT 5902 *Treatment of waste for landfill* – June 2014.
- Waste Classification: Guidance on the classification and assessment of waste (1st Edition v1.1) May 2018: Appendix A: How to use the list of waste.

We trust that this information is of interest and should you have any other requirements do not hesitate to contact us.

For Rogers Geotechnical Services Ltd,
Yours Faithfully

CC Mason

Charlotte Mason BSc FGS
Geo-environmental Engineer

Enc:
Site Plan
Trial Pit Records
WAC Results

Rogers Geotechnical Services Ltd
Office 1 & 2 Barncliffe Business Park,
Near Bank, Shelley, Huddersfield, HD8 8LU

Telephone 0843 50 666 87
Fax 0843 51 599 30
Company No: 5130864

Notes:

Investigation positions approximated from site operative's notes.

Environmental Geotechnical Specialists

RGS

Rogers Geotechnical Services Ltd

Offices 1 & 2, Barncliffe Business Park,
Near Bank,
Shelley,
Huddersfield,
HD8 8LU

Telephone: 0843 50 66 87
www.rogersgeotech.co.uk

Client:

Consilium Academies

Job Number:

C2267/21/E/3867

Project Details:

Armthorpe Academy

Scale:	Not to scale - reference only

Trial Pit Log

Trialpit No **TP04**

Sheet 1 of 1

Project Name: Armthorpe Academy	Project No. C2267/21/E/3510	Co-ords: - Level:	Date 14/03/2022
Location: Armthorpe, Doncaster DN3 2DA		Dimensions (m): Depth 0.80	Scale 1:25
Client: Sycamore Square Group			Logged RAP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND (Black top).
				0.35			MADE GROUND (Yellowish brown sandy sub-angular fine to coarse GRAVEL of dolostone. Low cobble content (Sub-base)).
				0.52			MADE GROUND (Cream and brown very sandy sub-angular fine to coarse GRAVEL of dolostone brick rare pottery and ash).
				0.80			Dark brown gravelly fine and medium SAND. Gravel is sub-rounded and rounded fine to coarse of various lithologies.
							End of pit at 0.80 m

Remarks: Pit completed with hand-held equipment.

Stability:

Trial Pit Log

Trialpit No **TP05**

Sheet 1 of 1

Project Name: Armthorpe Academy	Project No. C2267/21/E/3510	Co-ords: - Level:	Date 14/03/2022
Location: Armthorpe, Doncaster DN3 2DA		Dimensions (m): Depth 0.75	Scale 1:25
Client: Sycamore Square Group			Logged RAP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND (Black top).
				0.25			MADE GROUND (Dark grey clayey very sandy sub-rounded to angular fine to coarse GRAVEL of brick sandstone and clinker).
				0.40			MADE GROUND (Brown gravelly fine and medium SAND. Gravel is sub-angular to rounded fine to coarse of various lithologies brick and rare pottery (Re-worked)).
				0.75			Brown very sandy sub-rounded and rounded fine to coarse GRAVEL of various lithologies. Low cobble content.
							End of pit at 0.75 m

Remarks: Pit completed with hand-held equipment.

Stability:

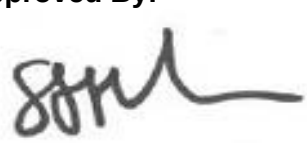
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-10159-1
Initial Date of Issue:	25-Mar-2022
Client	Rogers Geotechnical Services Ltd
Client Address:	Offices 1&2, Barncliffe Business Park Near Bank Shelley Huddersfield West Yorkshire HD8 8LU
Contact(s):	Harry Letch
Project	C2267/21/E/3867 Armthorpe Academy

Quotation No.:		**Date Received:**	17-Mar-2022
Order No.:		**Date Instructed:**	17-Mar-2022
No. of Samples:	2		
Turnaround (Wkdays):	7	**Results Due:**	25-Mar-2022
Date Approved:	25-Mar-2022		

Approved By:



Details: Stuart Henderson, Technical Manager

Results - 2 Stage WAC

Project: C2267/21/E/3867 Armthorpe Academy

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-10159								
Chemtest Sample ID:	1393335								
Sample Ref:	D						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:									
Sample Location:	TP04								
Top Depth(m):	0.35								
Bottom Depth(m):	0.40								
Sampling Date:	15-Mar-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			5.2	3	5	6
Loss On Ignition	2610	M	%			2.4	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			230	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			300	100	--	--
pH	2010	M				8.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.022	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0003	< 0.0002	0.0005	0.0005	0.5	2	25
Barium	1455	U	0.007	< 0.005	0.014	0.013	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0018	0.0018	0.0035	0.018	0.5	10	70
Copper	1455	U	0.0013	0.010	0.0026	0.0024	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0036	0.0009	0.0071	0.014	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200
Chloride	1220	U	32	5.5	64	100	800	15000	25000
Fluoride	1220	U	0.19	0.16	< 1.0	1.7	10	150	500
Sulphate	1220	U	2.3	< 1.0	< 10	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	160	72	320	880	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	20	13	< 50	140	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	7.9

Leachate Test Information	
Leachant volume 1st extract/l	0.335
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.324

Waste Acceptance Criteria

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

Results - 2 Stage WAC

Project: C2267/21/E/3867 Armthorpe Academy

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	22-10159								
Chemtest Sample ID:	1393336								
Sample Ref:	D						**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:									
Sample Location:	TP05								
Top Depth(m):	0.10								
Bottom Depth(m):	0.25								
Sampling Date:	15-Mar-2022								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	M	%			3.1	3	5	6
Loss On Ignition	2610	M	%			3.2	--	--	10
Total BTEX	2760	M	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg			< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg			1600	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			240	100	--	--
pH	2010	M				8.6	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.018	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0013	0.0011	0.0026	0.012	0.5	2	25
Barium	1455	U	0.021	0.012	0.041	0.13	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0031	0.0018	0.0062	0.019	0.5	10	70
Copper	1455	U	0.011	0.0077	0.022	0.012	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.011	0.0037	0.022	0.045	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0011	< 0.0005	0.0021	0.0011	0.06	0.7	5
Selenium	1455	U	0.0007	0.0007	0.0015	0.0067	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200
Chloride	1220	U	1.5	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.79	0.35	1.6	4.0	10	150	500
Sulphate	1220	U	9.1	2.3	18	30	1000	20000	50000
Total Dissolved Solids	1020	N	100	65	210	690	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	29	18	58	200	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	8.1

Leachate Test Information	
Leachant volume 1st extract/l	0.335
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.187

Waste Acceptance Criteria

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

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

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

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

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