

Rochdale Sixth Form College, Foundation Works Technical Note

Date: February 2024

Client Name: Waterman Structures Limited

Document Reference: WIE19085-108-TN-6.1.4-CWaters

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS EN ISO 45001:2018)

Issue	Prepared by	Checked & Approved by
	Name: Ugne Ankenaite Position: Consultant	Name: Andrew Mould Position: Associate Director
	 Signature:	 Signature:

1. Introduction & Objectives

The following Technical Note, prepared by Waterman Infrastructure & Environment Limited ('Waterman'), presents the results of additional groundwater sampling undertaken at Rochdale Sixth Form College (hereafter termed "the Site").

1.1 Background

Waterman undertook a ground investigation at the Site between 13th and 15th April 2023 (reported in July 2023). The scope of investigation undertaken at the Site comprised cable percussive and window sample boreholes together with gas and groundwater monitoring, and laboratory analysis of soil and groundwater samples. The report concluded a low risk to the River Roch and the underlying Secondary A Aquifer. The report was subject to review and approval by Rochdale Borough Council and the planning condition discharged.

In addition, Waterman also prepared a Foundation Works Risk Assessment (Ref. WIE19085-100-4-R-5.1.3-FWRA) for the proposed redevelopment at the Site. This was prepared and submitted in pursuit of discharge of planning condition 6, Ref. 22/01441/PSID.

The Environment Agency have reviewed the Foundation Works Risk Assessment and provided comments dated 12th February 2024 (Ref: SO/2023/123794/02-L01). This Technical Note has been prepared to address the Environment Agency (EA) comments.

The following reports should therefore be read in conjunction with this Technical Note:

- WIE. Generic Quantitative Risk Assessment – Rochdale Sixth Form College, Rochdale. Ref. WIE19085-108-4-R-4.1.3-GQRA, dated July 2023; and,
- WIE. Foundation Works Risk Assessment – Rochdale Sixth Form College, Rochdale. Ref. WIE19085-100-4-R-5.1.3-FWRA, dated November 2023.

1.2 Limitations and Constrains

The information contained in this technical note is based on a review of available information, consultation with the regulatory authorities and observations made on site.

The benefit of this technical note is made to Waterman Structures Limited.

The ground conditions reported relate only to the point of excavation and do not necessarily guarantee a continuation of the ground conditions throughout the non-inspected area of the site. Whilst such exploratory holes would usually provide a reasonable indication as to the general ground conditions, these cannot be determined with complete certainty.

Waterman has endeavoured to assess all information provided to them during this investigation but makes no guarantees or warranties as to the accuracy or completeness of this information.

The scope of this Technical Note does not include an assessment of the presence of asbestos.

2. Environment Agency Comments

The EA have reviewed the submitted Foundation Works Risk Assessment and provided the following comments:

The Foundation Works Risk Assessment (FWRA) proposes the use of pre-formed driven piles to rockhead in the underlying Secondary A aquifer coal measures.

We note that the site investigation carried out in 2023 identified unusually elevated iron concentrations, up to 16mg/l, in groundwater encountered in the sand layer in the drift deposits when compared to the EQS for iron which is 1mg/l.

Puncturing the clay drift, which overlies the bedrock and piling into the upper bedrock may create preferential pathways for contaminated groundwater in the sand horizon to enter the underlying Secondary A aquifer bedrock and present a risk of increased mobilisation, which may affect the River Roch.

The FWRA proposes carrying out groundwater monitoring during and following the piling works.

Advice to the applicant

We require a round of groundwater sampling to be carried out prior to carrying out the piling works to verify whether the unusually high iron concentrations are truly as high as 16mg/l in CP101 and CP102.

Without this information we cannot recommend discharge of this condition due to the unusually high iron concentrations found in shallow groundwater and risk of breaching the aquitard protecting the underlying Secondary A aquifer.

3. Additional Groundwater Sampling

Following review of the EA comments above Waterman completed a round of groundwater sampling to further investigate the high levels of iron. 1No. additional visit was undertaken on 16th February 2024 to further characterise the groundwater underlying the site.

Groundwater samples were obtained from the monitoring wells following purging of three well volumes using a submersible low flow pump. On-site testing of groundwater for temperature, pH, conductivity, and dissolved oxygen was undertaken. The collected water samples were then sealed into bottles with pre-measured fixatives where necessary, as supplied by the specialist laboratory, and transported in cool boxes to the testing laboratory.

The groundwater laboratory certificates are presented in Appendix B and the recorded elevated concentrations when compared to EQS values are shown in Table 2.

Groundwater Results

Table 2 presents the groundwater results of the two rounds of sampling.

Table 1: Groundwater Sampling Results

Date of Sampling	Threshold Value Iron (µg/l)	Iron Concentration (ug/l)	
		CP01	CP02
28/04/2023	1,000	1,466	16,960.6
16/02/2024	1,000	47	1,179

It can be observed that significantly greater concentrations of dissolved iron were recorded during the first monitoring round at CP102, with a significant reduction in the iron concentrations from the original sampling undertaken.

The second round of sampling recorded one marginal exceedance above the EQS of 1,000ug/l. It is considered the first round of sampling shows anomalous results.

Two water bodies were identified at the Site during the ground investigation. A shallow water body associated with the Alluvium at the Site, struck between depths of 3m and 5m bgl. A second water body associated with the underlying Lower Coal Measures was also recorded from depth of 8.10m bgl in CP02 only. The water strike recorded in borehole CP02 was within the mudstone, considered to be representative of the Secondary A Aquifer.

Typically, a mudstone will act as an aquiclude as it is limited in its porosity and transmissivity resulting in limited migration of contaminants.

4. Assessment of Driven Piles Risk

The EA also state the following:

‘Puncturing the clay drift, which overlies the bedrock and piling into the upper bedrock may create preferential pathways for contaminated groundwater in the sand horizon to enter the underlying Secondary A aquifer bedrock and present a risk of increased mobilisation, which may affect the River Roch’.

‘.....Without this information we cannot recommend discharge of this condition due to the unusually high iron concentrations found in shallow groundwater and risk of breaching the aquitard protecting the underlying Secondary A Aquifer’.

Secondary A Aquifer Within the Pennine Lower Coal Measures Formation

Based on the information provided within the Waterman Phase 2 report, it is considered that there are two waterbodies at the Site, one associated with the sand horizon and one associated with the Lower Coal Measures, struck within mudstone at a depth of 8.1m bgl in one borehole only.

The mudstone at the Site is considered to be acting as an aquiclude in a similar way to the overlying Clay layer. The piles will extend to a depth of 1.0m to 1.5m into the mudstone and will terminate in the mudstone. The boreholes in the local area indicate that the mudstone is likely to extend to a depth of approximately 30m (BGS BH Refs. 29740; 29742); and therefore there is a significant thickness of mudstone remains between the end of the piles and a more water bearing strata of sandstone.

Within coal measures the more permeable strata typically contain and transmit groundwater.

The marginally elevated iron concentrations recorded in the recent groundwater sampling round together with the limited porosity and transmissivity of the mudstone combined indicate the risk of increased mobilisation within the Lower Coal Measures to be Low.

Risk to the River Roch

The River Roch flows from south to north on the eastern boundary of the Site. It is considered the canalisation of the surface water will mean lateral migration of groundwater and contaminants into the river is likely to be restricted.

Additionally, it is considered unlikely that the River Roch is in connectivity with the Secondary A Aquifer associated with the Pennine Lower Coal Measures as the River Roch canalised base is unlikely to extend beyond 8.0m bgl where the groundwater table within the mudstone bedrock was established. Therefore, it is considered unlikely that the proposed piling works will result in potential contaminant migration into the River Roch.

Piling Technique

The proposed piling method for the Site is pre-formed driven piles extending 1.0m to 1.5m into the Mudstone bedrock. The piles will comprise cylindrical 244mm driven tube piles into the Mudstone for a working load of 750kN.

Driven cylindrical piles affect the surrounding soil as high stresses are induced in the surrounding ground when driving displacement piles. These stresses increase with size of pile and magnitude

of displacement. In most soils these stresses will tend to force the soil to close up around the pile shaft, which means that the development of preferential flow paths around the outside of the piles is, in general, unlikely.

The Environment Agency guidance 'Piling in Layered Ground: Risk to Groundwater and Archaeology, Ref. SC020074/SR, dated 2006', presents research into the behaviour of the ground when piles including driven piles are installed. The report concludes that 'solid cylindrical piles are able to form a seal when driven through a clay layer with a thickness of at least two pile diameters, although this result may not hold for heavily over consolidated clays'.

The depth of the Clay at the Site is recorded between 3.60 and 4.50m with the pile diameters of 244mm, indicating that the Clay layer is at least two pile diameters greater.

This further concludes that a pathway between the overlying water contained with the alluvium and the underlying mudstone should not be created when using the specified piles.

5. Conclusions and Recommendations

The concerns raised by the EA regarding the significantly elevated dissolved iron concentrations and potential risk of vertical migration of contaminants during the piling works have been discussed in this Technical Note.

The supplementary groundwater monitoring round recorded significantly lower dissolved iron concentrations compared to those recorded during the initial sampling round. The concentrations of dissolved iron were recorded to only marginally exceed the EQS threshold values in one borehole (CP102).

Based on the presence of marginally elevated iron concentrations in the Secondary A Aquifer in the drift deposits and the limited likelihood of the proposed piled foundations creating preferential pathways, It is concluded that the installation of the piles represents a low risk to the underlying deeper Secondary A Aquifer and the River Roch in regards to contaminant migration.

Groundwater monitoring and sampling is recommended during and after piling works to confirm risks to the underlying bedrock aquifer during the piling works remain low.

APPENDICIES

Appendicies

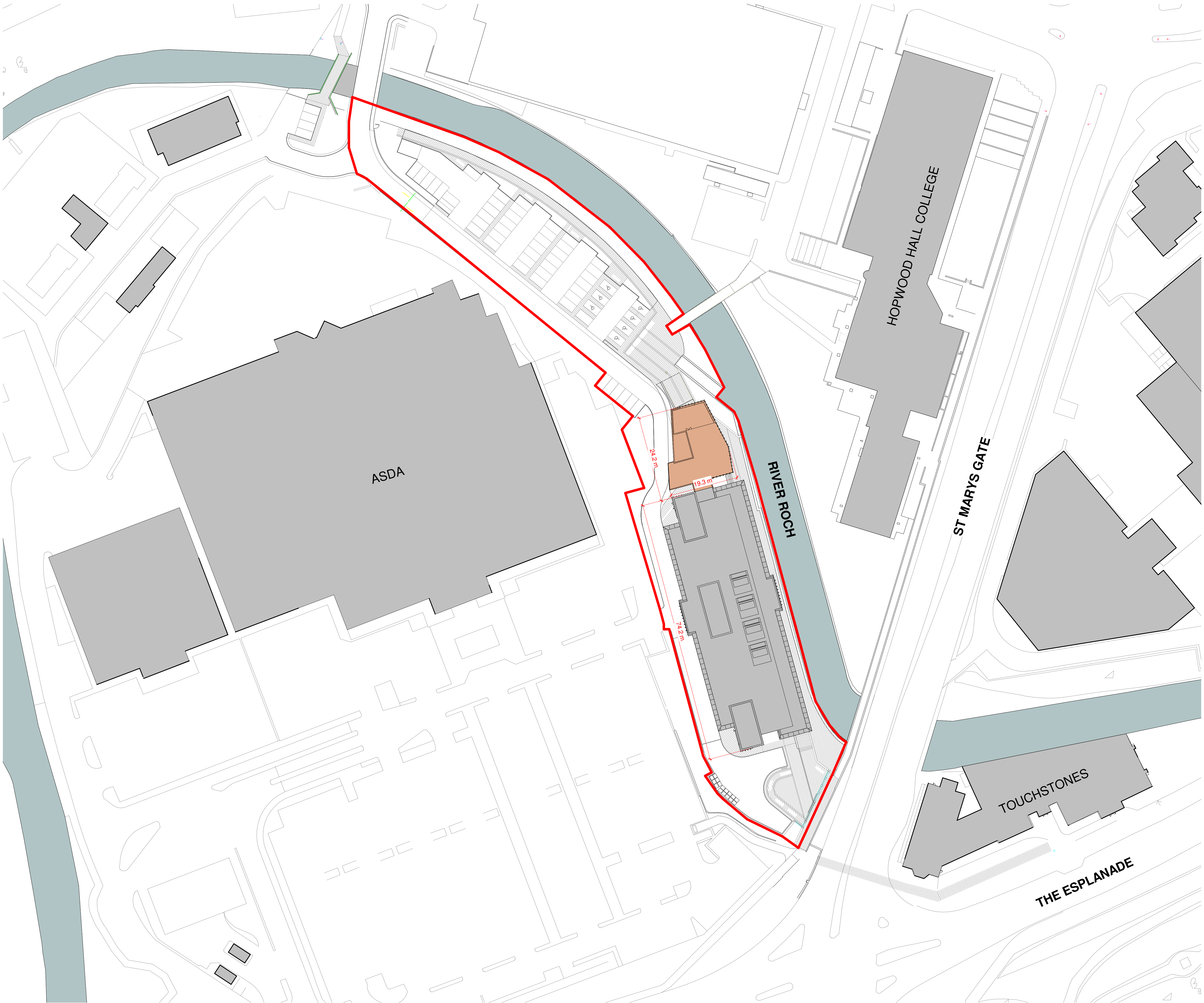
Foundation Works Technical Note
WIE19085-108-TN-6.1.4-CWaters

Appendix A

- Proposed Development Plan
- Borehole Location Plan

Appendices

Foundation Works Technical Note
WIE19085-108-TN-6.1.4-CWaters



NOTE:
1. ANY DISCREPANCIES TO BE REPORTED IMMEDIATELY TO THE ARCHITECT.
2. ALL DIMENSIONS TO BE SITE CHECKED & VERIFIED BY THE CONTRACTOR PRIOR TO THE MANUFACTURE OR ORDER OF ANY MATERIALS OR GOODS.

KEY:
— PROPOSAL BOUNDARY



P2	Planning Permission Submission	02.11.22
P1	Issued for comment	28.10.22
Rev	Description	Date

PLANNING
Rochdale Sixth Form College
College Road, Rochdale, OL12 6HY

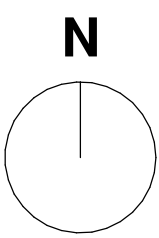
Proposed Site Plan

DRAWING NUMBER
3940-A-1002P

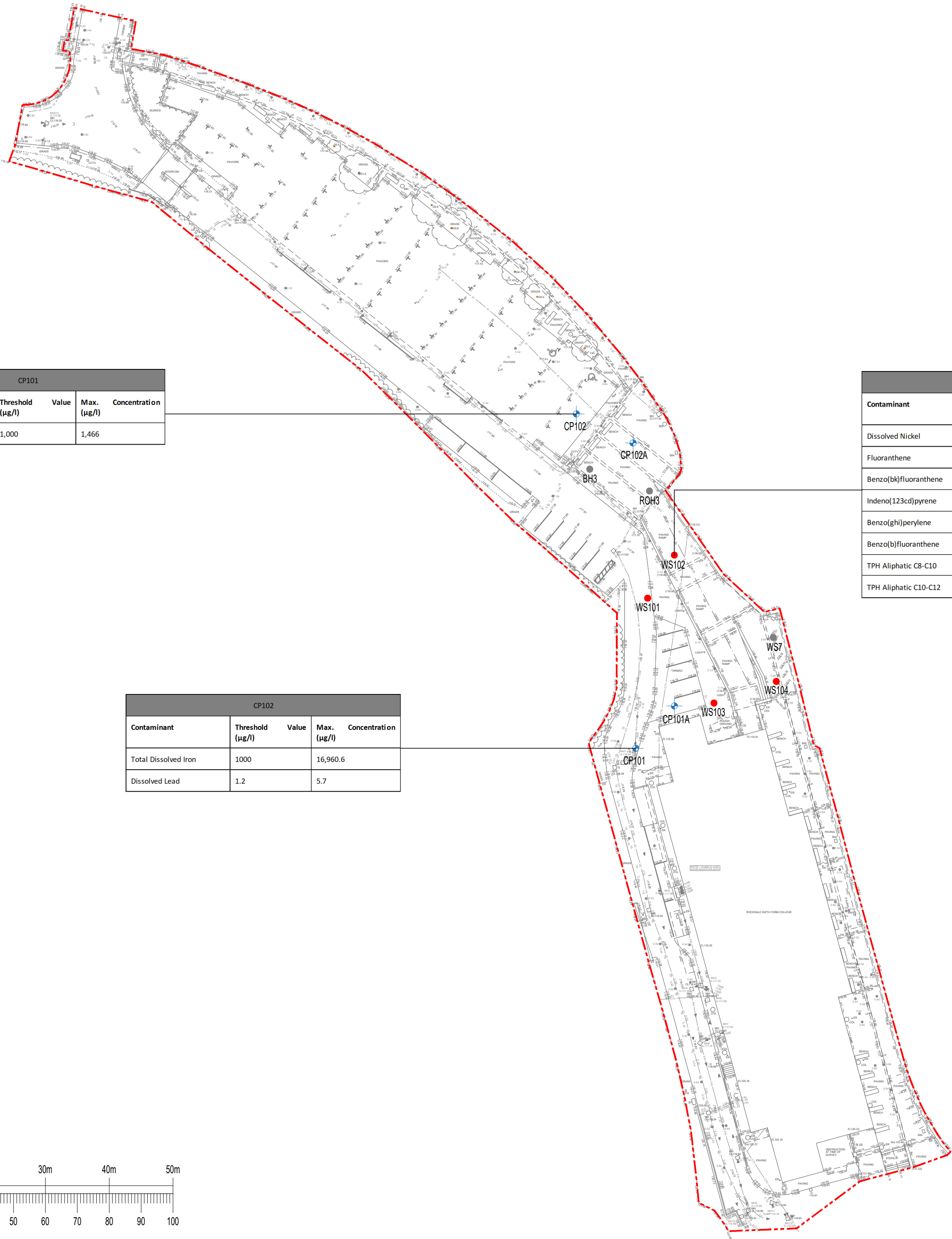
DATE 10/25/22	REVISION P2	STATUS PURPOSE OF ISSUE
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ABW architects Ltd.
architecture building workshop

A1
©



02110202 15:21:16



CP101				
Contaminant	Threshold (µg/l)	Value	Max. (µg/l)	Concentration
Total Dissolved Iron	1,000		1,466	

CP102				
Contaminant	Threshold (µg/l)	Value	Max. (µg/l)	Concentration
Total Dissolved Iron	1000		16,960.6	
Dissolved Lead	1.2		5.7	

WS102				
Contaminant	Threshold (µg/l)	Value	Max. (µg/l)	Concentration
Dissolved Nickel	4.0		9.8	
Fluoranthene	0.00630		0.043	
Benzo(bk)fluoranthene	0.00017		0.026	
Indeno(123cd)pyrene	0.00017		0.005	
Benzo(ghi)perylene	0.00017		0.006	
Benzo(b)fluoranthene	0.00017		0.019	
TPH Aliphatic C8-C10	N/A		64	
TPH Aliphatic C10-C12	N/A		54	

This drawing should not be scaled. Dimensions to be verified on site.
Any discrepancies should be referred to the Engineer prior to work being put in hand.

This drawing is the property of Waterman Infrastructure & Environment Limited, and the drawing is issued on the condition that it is not copied reproduced, retained or disclosed to any unauthorised person, either wholly or in part without the consent in writing of Waterman Infrastructure & Environment Limited
Pickfords Wharf, Clink Street, London SE1 9DG t 020 7928 7888 f 03333 444 501

GENERAL NOTES

- SURVEY AREA
- WINDOW SAMPLE LOCATION
- + CABLE PERCUSSION BOREHOLE
- HISTORICAL EXPLORATORY HOLE

P01	17.11.23	INFORMATION ISSUE			MC UA
Rev	Date	Description			By Chk

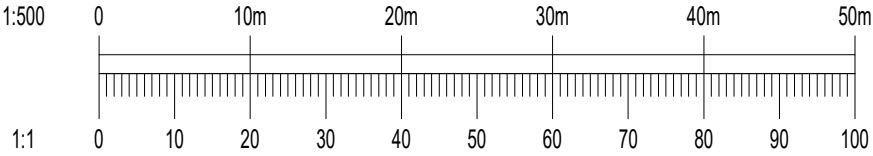
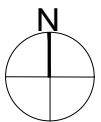
Amendments

Project	ROCHDALE COLLEGE				
Title	GROUNDWATER EXCEEDANCE PLAN				
Client	-				



Pickfords Wharf Clink Street London SE1 9DG
t 020 7928 7888
mail@watermangroup.com www.watermangroup.com

SUITABILITY				INFORMATION		S2
Designed By	UA	Director	AM	Waterman Ref	WIE19085	
Drawn By	MC	Date	NOVEMBER 2023	Scales @ A2	1:500	
Project - Originator - Volume - Level - Type - Role - Number						Revision
19085-100-WIE-ZZ-XX-DR-V-80-0002						P01



Appendix B

Groundwater Laboratory Certificates

Appendices

Foundation Works Technical Note
WIE19085-108-TN-6.1.4-CWaters

Waterman Infrastructure & Environment Limited
11 Peter Street
Manchester
United Kingdom
M2 5QR



4225



Attention : Andrew Mould
Date : 18th May, 2023
Your reference : WIE19085
Our reference : Test Report 23/6732 Batch 1
Location : Rochdale Sixth Form
Date samples received : 28th April, 2023
Status : Final Report
Issue : 1

Three samples were received for analysis on 28th April, 2023 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Simon Gomery BSc

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE19085
Location: Rochdale Sixth Form
Contact: Andrew Mould
EMT Job No: 23/6732

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

EMT Sample No.	1-7	8-14	15-16									
Sample ID	CP101	CP102	WS102									
Depth												
COC No / misc												
Containers	V H N N Z P G	V H N N Z P G	P G									
Sample Date	28/04/2023	28/04/2023	28/04/2023									
Sample Type	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1									
Date of Receipt	28/04/2023	28/04/2023	28/04/2023									
										LOD/LOR	Units	Method No.
Dissolved Arsenic #	4.3	3.8	1.9							<0.9	ug/l	TM170/PM14
Dissolved Barium #	156.1	242.9	97.7							<1.8	ug/l	TM170/PM14
Dissolved Beryllium #	<0.5	<0.5	<0.5							<0.5	ug/l	TM170/PM14
Dissolved Boron #	51	52	46							<12	ug/l	TM170/PM14
Dissolved Cadmium #	<0.03	<0.03	0.04							<0.03	ug/l	TM170/PM14
Total Dissolved Chromium #	0.3	1.2	0.2							<0.2	ug/l	TM170/PM14
Dissolved Cobalt #	0.9	1.0	2.1							<0.1	ug/l	TM170/PM14
Dissolved Copper #	<1	2	4							<1	ug/l	TM170/PM14
Total Dissolved Iron #	1466.0 ^{AC}	16960.6 ^{AD}	9.5							<4.7	ug/l	TM170/PM14
Dissolved Lead #	<0.4	5.7	<0.4							<0.4	ug/l	TM170/PM14
Dissolved Mercury #	<0.5	<0.5	<0.5							<0.5	ug/l	TM170/PM14
Dissolved Molybdenum #	5.3	5.4	21.8							<0.2	ug/l	TM170/PM14
Dissolved Nickel #	2.7	2.4	9.8							<0.2	ug/l	TM170/PM14
Dissolved Selenium #	1.7	2.9	2.9							<1.2	ug/l	TM170/PM14
Dissolved Vanadium #	1.6	1.4	1.1							<0.6	ug/l	TM170/PM14
Dissolved Zinc #	2.9	11.6	2.3							<1.5	ug/l	TM170/PM14
Dissolved Calcium #	91.6	88.9	63.4							<0.2	mg/l	TM30/PM14
Dissolved Magnesium #	5.9	11.7	6.5							<0.1	mg/l	TM30/PM14
Total Hardness Dissolved (as CaCO3)	254	271	186							<1	mg/l	TM30/PM14
PAH MS												
Naphthalene #	<0.1	<0.1	<0.1							<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.005	<0.005	0.005							<0.005	ug/l	TM4/PM30
Acenaphthene #	0.007	0.005	0.015							<0.005	ug/l	TM4/PM30
Fluorene #	<0.005	0.005	<0.005							<0.005	ug/l	TM4/PM30
Phenanthrene #	<0.005	<0.005	0.006							<0.005	ug/l	TM4/PM30
Anthracene #	<0.005	<0.005	0.006							<0.005	ug/l	TM4/PM30
Fluoranthene #	<0.005	<0.005	0.043							<0.005	ug/l	TM4/PM30
Pyrene #	<0.005	<0.005	0.042							<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005	<0.005	0.016							<0.005	ug/l	TM4/PM30
Chrysene #	<0.005	<0.005	0.021							<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.008	<0.008	0.026							<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.005	<0.005	<0.005							<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005 ⁺	<0.005 ⁺	0.005							<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005 ⁺	<0.005 ⁺	<0.005							<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005	<0.005	0.006							<0.005	ug/l	TM4/PM30
PAH 16 Total #	<0.173	<0.173	0.191							<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	<0.008	0.019							<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008	<0.008							<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	88	86	90							<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1	<0.1	-							<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	-							<0.5	ug/l	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE19085
Location: Rochdale Sixth Form
Contact: Andrew Mould
EMT Job No: 23/6732

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

EMT Sample No.	1-7	8-14	15-16									
Sample ID	CP101	CP102	WS102									
Depth												
COC No / misc												
Containers	V H N N Z P G	V H N N Z P G	P G									
Sample Date	28/04/2023	28/04/2023	28/04/2023									
Sample Type	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1									
Date of Receipt	28/04/2023	28/04/2023	28/04/2023									
										LOD/LOR	Units	Method No.
Toluene #	<5	<5	-							<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	-							<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	-							<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	-							<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	110	129	-							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	116	129	-							<0	%	TM15/PM10
SVOC TICs	ND	ND _{AB}	ND								None	TM16/PM30
MTBE #	-	-	<5							<5	ug/l	TM36/PM12
Benzene #	-	-	<5							<5	ug/l	TM36/PM12
Toluene #	-	-	<5							<5	ug/l	TM36/PM12
Ethylbenzene #	-	-	<5							<5	ug/l	TM36/PM12
m/p-Xylene #	-	-	<5							<5	ug/l	TM36/PM12
o-Xylene #	-	-	<5							<5	ug/l	TM36/PM12
TPH CWG												
Aliphatics												
>C5-C6 #	<10	<10	<10							<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10	<10							<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10	64							<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	54							<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>C35-C44	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-44	<10	<10	118							<10	ug/l	TM5/PM16/PM30
Aromatics												
>C5-EC7 #	<10	<10	<10							<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	<10							<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10	<10							<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5	<5							<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
>EC35-EC44	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aromatics C5-44	<10	<10	<10							<10	ug/l	TM5/PM16/PM30
Total aliphatics and aromatics(C5-44)	<10	<10	118							<10	ug/l	TM5/PM16/PM30
Sulphate as SO ₄ #	44.3	31.1	69.0							<0.5	mg/l	TM38/PM0
Chloride #	138.4	126.7	371.9							<0.3	mg/l	TM38/PM0
Nitrate as NO ₃ #	<0.2	<0.2	<0.2							<0.2	mg/l	TM38/PM0
Free Cyanide #	<0.01	<0.01	-							<0.01	mg/l	TM89/PM0

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE19085
Location: Rochdale Sixth Form
Contact: Andrew Mould
EMT Job No: 23/6732

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

[illegible]

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE19085
Location: Rochdale Sixth Form
Contact: Andrew Mould
EMT Job No: 23/6732

SVOC Report : Liquid

EMT Sample No.	1-7	8-14	15-16									
Sample ID	CP101	CP102	WS102									
Depth												
COC No / misc												
Containers	V H N N Z P G	V H N N Z P G	P G									
Sample Date	28/04/2023	28/04/2023	28/04/2023									
Sample Type	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1									
Date of Receipt	28/04/2023	28/04/2023	28/04/2023									
										LOD/LOR	Units	Method No.
SVOC MS												
Phenols												
2-Chlorophenol #	<2 _{AA}	<3 _{AB}	<1							<1	ug/l	TM16/PM30
2-Methylphenol #	<1.0 _{AA}	<1.5 _{AB}	<0.5							<0.5	ug/l	TM16/PM30
2-Nitrophenol	<1.0 _{AA}	<1.5 _{AB}	<0.5							<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol #	<1.0 _{AA}	<1.5 _{AB}	<0.5							<0.5	ug/l	TM16/PM30
2,4-Dimethylphenol	<2 _{AA}	<3 _{AB}	<1							<1	ug/l	TM16/PM30
2,4,5-Trichlorophenol #	<1.0 _{AA}	<1.5 _{AB}	<0.5							<0.5	ug/l	TM16/PM30
2,4,6-Trichlorophenol	<2 _{AA}	<3 _{AB}	<1							<1	ug/l	TM16/PM30
4-Chloro-3-methylphenol #	<1.0 _{AA}	<1.5 _{AB}	<0.5							<0.5	ug/l	TM16/PM30
4-Methylphenol	<2 _{AA}	<3 _{AB}	<1							<1	ug/l	TM16/PM30
4-Nitrophenol	<20 _{AA}	<30 _{AB}	<10							<10	ug/l	TM16/PM30
Pentachlorophenol	<2 _{AA}	<3 _{AB}	<1							<1	ug/l	TM16/PM30
Phenol	<2 _{AA}	<3 _{AB}	<1							<1	ug/l	TM16/PM30
PAHs												
2-Chloronaphthalene #	<2 _{AA}	<3 _{AB}	<1							<1	ug/l	TM16/PM30
2-Methylnaphthalene #	<2 _{AA}	<3 _{AB}	<1							<1	ug/l	TM16/PM30
Naphthalene #	<2 _{AA}	<3 _{AB}	<1							<1	ug/l	TM16/PM30
Acenaphthylene #	<1.0 _{AA}	<1.5 _{AB}	<0.5							<0.5	ug/l	TM16/PM30
Acenaphthene #	<2 _{AA}	<3 _{AB}	<1							<1	ug/l	TM16/PM30
Fluorene #	<1.0 _{AA}	<1.5 _{AB}	<0.5							<0.5	ug/l	TM16/PM30
Phenanthrene #	<1.0 _{AA}	<1.5 _{AB}	<0.5							<0.5	ug/l	TM16/PM30
Anthracene #	<1.0 _{AA}	<1.5 _{AB}	<0.5							<0.5	ug/l	TM16/PM30
Fluoranthene #	<1.0 _{AA}	<1.5 _{AB}	<0.5							<0.5	ug/l	TM16/PM30
Pyrene #	<1.0 _{AA}	<1.5 _{AB}	<0.5							<0.5	ug/l	TM16/PM30
Benzo(a)anthracene #	<1.0 _{AA}	<1.5 _{AB}	<0.5							<0.5	ug/l	TM16/PM30
Chrysene #	<1.0 _{AA}	<1.5 _{AB}	<0.5							<0.5	ug/l	TM16/PM30
Benzo(bk)fluoranthene #	<2 _{AA}	<3 _{AB}	<1							<1	ug/l	TM16/PM30
Benzo(a)pyrene	<2 _{AA}	<3 _{AB}	<1							<1	ug/l	TM16/PM30
Indeno(123cd)pyrene	<2 _{AA}	<3 _{AB}	<1							<1	ug/l	TM16/PM30
Dibenzo(ah)anthracene #	<1.0 _{AA}	<1.5 _{AB}	<0.5							<0.5	ug/l	TM16/PM30
Benzo(ghi)perylene #	<1.0 _{AA}	<1.5 _{AB}	<0.5							<0.5	ug/l	TM16/PM30
Phthalates												
Bis(2-ethylhexyl) phthalate	<10 _{AA}	<15 _{AB}	<5							<5	ug/l	TM16/PM30
Butylbenzyl phthalate	<2 _{AA}	<3 _{AB}	<1							<1	ug/l	TM16/PM30
Di-n-butyl phthalate #	<3.0 _{AA}	<4.5 _{AB}	<1.5							<1.5	ug/l	TM16/PM30
Di-n-Octyl phthalate	<2 _{AA}	<3 _{AB}	<1							<1	ug/l	TM16/PM30
Diethyl phthalate #	<2 _{AA}	<3 _{AB}	<1							<1	ug/l	TM16/PM30
Dimethyl phthalate	<2 _{AA}	<3 _{AB}	<1							<1	ug/l	TM16/PM30

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE19085
Location: Rochdale Sixth Form
Contact: Andrew Mould
EMT Job No: 23/6732

SVOC Report : Liquid

EMT Sample No.	1-7	8-14	15-16									
Sample ID	CP101	CP102	WS102									
Depth												
COC No / misc												
Containers	V H N N Z P G	V H N N Z P G	P G									
Sample Date	28/04/2023	28/04/2023	28/04/2023									
Sample Type	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1									
Date of Receipt	28/04/2023	28/04/2023	28/04/2023									
	LOD/LOR	Units	Method No.									
SVOC MS												
Other SVOCs												
1,2-Dichlorobenzene #	<2 ⁺ AA	<3 ⁺ AB	<1 ⁺							<1	ug/l	TM16/PM30
1,2,4-Trichlorobenzene #	<2 AA	<3 AB	<1							<1	ug/l	TM16/PM30
1,3-Dichlorobenzene #	<2 AA	<3 AB	<1							<1	ug/l	TM16/PM30
1,4-Dichlorobenzene #	<2 AA	<3 AB	<1							<1	ug/l	TM16/PM30
2-Nitroaniline	<2 AA	<3 AB	<1							<1	ug/l	TM16/PM30
2,4-Dinitrotoluene #	<1.0 AA	<1.5 AB	<0.5							<0.5	ug/l	TM16/PM30
2,6-Dinitrotoluene	<2 AA	<3 AB	<1							<1	ug/l	TM16/PM30
3-Nitroaniline	<2 AA	<3 AB	<1							<1	ug/l	TM16/PM30
4-Bromophenylphenylether #	<2 AA	<3 AB	<1							<1	ug/l	TM16/PM30
4-Chloroaniline	<2 AA	<3 AB	<1							<1	ug/l	TM16/PM30
4-Chlorophenylphenylether #	<2 AA	<3 AB	<1							<1	ug/l	TM16/PM30
4-Nitroaniline	<1.0 AA	<1.5 AB	<0.5							<0.5	ug/l	TM16/PM30
Azobenzene #	<1.0 AA	<1.5 AB	<0.5							<0.5	ug/l	TM16/PM30
Bis(2-chloroethoxy)methane #	<1.0 AA	<1.5 AB	<0.5							<0.5	ug/l	TM16/PM30
Bis(2-chloroethyl)ether #	<2 AA	<3 AB	<1							<1	ug/l	TM16/PM30
Carbazole #	<1.0 AA	<1.5 AB	<0.5							<0.5	ug/l	TM16/PM30
Dibenzofuran #	<1.0 AA	<1.5 AB	<0.5							<0.5	ug/l	TM16/PM30
Hexachlorobenzene #	<2 AA	<3 AB	<1							<1	ug/l	TM16/PM30
Hexachlorobutadiene #	<2 AA	<3 AB	<1							<1	ug/l	TM16/PM30
Hexachlorocyclopentadiene	<2 AA	<3 AB	<1							<1	ug/l	TM16/PM30
Hexachloroethane #	<2 AA	<3 AB	<1							<1	ug/l	TM16/PM30
Isophorone #	<1.0 AA	<1.5 AB	<0.5							<0.5	ug/l	TM16/PM30
N-nitrosodi-n-propylamine #	<1.0 AA	<1.5 AB	<0.5							<0.5	ug/l	TM16/PM30
Nitrobenzene #	<2 AA	<3 AB	<1							<1	ug/l	TM16/PM30
Surrogate Recovery 2-Fluorobiphenyl	90 AA	118 AB	127							<0	%	TM16/PM30
Surrogate Recovery p-Terphenyl-d14	114 AA	120 AB	137 ^{SV}							<0	%	TM16/PM30

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE19085
Location: Rochdale Sixth Form
Contact: Andrew Mould
EMT Job No: 23/6732

VOC Report : Liquid

EMT Sample No.	1-7	8-14										
Sample ID	CP101	CP102										
Depth												
COC No / misc												
Containers	V H N N Z P G	V H N N Z P G										
Sample Date	28/04/2023	28/04/2023										
Sample Type	Ground Water	Ground Water										
Batch Number	1	1										
Date of Receipt	28/04/2023	28/04/2023										
	LOD/LOR	Units	Method No.									
VOC MS												
Dichlorodifluoromethane	<2	<2								<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1								<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3								<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1								<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1								<1	ug/l	TM15/PM10
Chloroethane #	<3	<3								<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3								<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3								<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3	<3								<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3								<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3								<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3								<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1								<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2								<2	ug/l	TM15/PM10
Chloroform #	<2	<2								<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2								<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3								<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2								<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2								<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5								<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3								<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2								<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3								<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2								<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2								<2	ug/l	TM15/PM10
Toluene #	<5	<5								<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2								<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2								<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3								<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2								<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2								<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2								<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2								<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2								<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1								<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2								<2	ug/l	TM15/PM10
o-Xylene #	<1	<1								<1	ug/l	TM15/PM10
Styrene	<2	<2								<2	ug/l	TM15/PM10
Bromoform #	<2	<2								<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3								<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4								<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2								<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3								<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3								<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3								<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3								<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3								<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3								<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3								<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3								<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3								<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3								<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3								<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3								<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3								<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2								<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3								<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3								<3	ug/l	TM15/PM10
Naphthalene	<2	<2								<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3								<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	110	129								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	116	129								<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Matrix : Liquid

Location: Rochdale Sixth Form

Contact: Andrew Mould

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/6732

SOILS and ASH

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

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x2 Dilution
AB	x3 Dilution
AC	x5 Dilution
AD	x20 Dilution

HWOL ACRONYMS AND OPERATORS USED

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 & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 23/6732

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				

EMT Job No: 23/6732

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEPA Method 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes			
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			

Waterman Infrastructure & Environment Limited
11 Peter Street
Manchester
United Kingdom
M2 5QR



4225



Attention : Andrew Mould
Date : 21st February, 2024
Your reference : WIE19085
Our reference : Test Report 24/2808 Batch 1
Location : Rochdale 6th Form College
Date samples received : 19th February, 2024
Status : Final Report
Issue : 202402211537

Three samples were received for analysis on 19th February, 2024 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 7.24 kg of CO2

Scope 1&2&3 emissions - 17.11 kg of CO2

Authorised By:



Paul Boden BSc
Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE19085
Location: Rochdale 6th Form College
Contact: Andrew Mould
EMT Job No: 24/2808

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

EMT Sample No.	1-9	10-18	19-27								Please see attached notes for all abbreviations and acronyms		
Sample ID	CP02	WS102	CP01										
Depth	4.00	1.00	5.00										
COC No / misc													
Containers	V H N P G	V H N P G	V H N P G										
Sample Date	16/02/2024 08:00	16/02/2024 08:30	16/02/2024 09:20										
Sample Type	Ground Water	Ground Water	Ground Water										
Batch Number	1	1	1										
Date of Receipt	19/02/2024	19/02/2024	19/02/2024								LOD/LOR	Units	Method No.
Dissolved Arsenic #	<0.9	6.3	2.2								<0.9	ug/l	TM170/PM14
Dissolved Barium #	193.1	106.6	80.6								<1.8	ug/l	TM170/PM14
Dissolved Beryllium #	<0.5	<0.5	<0.5								<0.5	ug/l	TM170/PM14
Dissolved Boron #	24	15	31								<12	ug/l	TM170/PM14
Dissolved Cadmium #	0.07	<0.03	<0.03								<0.03	ug/l	TM170/PM14
Total Dissolved Chromium #	0.6	3.5	2.2								<0.2	ug/l	TM170/PM14
Dissolved Cobalt #	1.3	0.2	0.2								<0.1	ug/l	TM170/PM14
Dissolved Copper #	2	6	2								<1	ug/l	TM170/PM14
Total Dissolved Iron #	1179.9 ^{AA}	30.0	47.0								<4.7	ug/l	TM170/PM14
Dissolved Lead #	<0.4	<0.4	<0.4								<0.4	ug/l	TM170/PM14
Dissolved Mercury #	<0.5	<0.5	<0.5								<0.5	ug/l	TM170/PM14
Dissolved Molybdenum #	1.6	5.8	4.8								<0.2	ug/l	TM170/PM14
Dissolved Nickel #	2.7	1.1	0.7								<0.2	ug/l	TM170/PM14
Dissolved Selenium #	<1.2	1.2	<1.2								<1.2	ug/l	TM170/PM14
Dissolved Vanadium #	<0.6	15.2	2.9								<0.6	ug/l	TM170/PM14
Dissolved Zinc #	5.5	2.9	3.2								<1.5	ug/l	TM170/PM14
Dissolved Calcium #	49.6	204.2	79.1								<0.2	mg/l	TM30/PM14
Dissolved Magnesium #	4.2	0.8	3.3								<0.1	mg/l	TM30/PM14
Total Hardness Dissolved (as CaCO3)	142	514	212								<1	mg/l	TM30/PM14
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1								<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5								<0.5	ug/l	TM15/PM10
Toluene #	<5	<5	<5								<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1								<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2								<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1								<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	93	100	100								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	98	101	102								<0	%	TM15/PM10
SVOC TICs	ND	ND	ND									None	TM16/PM30
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<10	<10	<10								<10	ug/l	TM36/PM12
>C6-C8 (HS_1D_AL) #	<10	<10	<10								<10	ug/l	TM36/PM12
>C8-C10 (HS_1D_AL) #	<10	<10	<10								<10	ug/l	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<5	<5	<5								<5	ug/l	TM5/PM16/PM30
>C12-C16 (EH_CU_1D_AL) #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>C16-C21 (EH_CU_1D_AL) #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>C21-C35 (EH_CU_1D_AL) #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>C35-C44 (EH_CU_1D_AL)	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-44 (EH_CU+HS_1D_AL)	<10	<10	<10								<10	ug/l	TM5/PM16/PM30

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE19085
Location: Rochdale 6th Form College
Contact: Andrew Mould
EMT Job No: 24/2808

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HN0₃

EMT Sample No.	1-9	10-18	19-27								Please see attached notes for all abbreviations and acronyms		
Sample ID	CP02	WS102	CP01										
Depth	4.00	1.00	5.00										
COC No / misc													
Containers	V H N P G	V H N N P G	V H N N P G										
Sample Date	16/02/2024 08:00	16/02/2024 08:30	16/02/2024 09:20										
Sample Type	Ground Water	Ground Water	Ground Water										
Batch Number	1	1	1										
Date of Receipt	19/02/2024	19/02/2024	19/02/2024								LOD/LOR	Units	Method No.
TPH CWG													
Aromatics													
>C5-EC7 (HS_1D_AR) #	<10	<10	<10								<10	ug/l	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<10	<10	<10								<10	ug/l	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<10	<10	<10								<10	ug/l	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<5 ^{SV}	<5	<5								<5	ug/l	TM5/PM16/PM30
>EC12-EC16 (EH_CU_1D_AR) #	<10 ^{SV}	<10	<10								<10	ug/l	TM5/PM16/PM30
>EC16-EC21 (EH_CU_1D_AR) #	<10 ^{SV}	<10	<10								<10	ug/l	TM5/PM16/PM30
>EC21-EC35 (EH_CU_1D_AR) #	<10 ^{SV}	<10	<10								<10	ug/l	TM5/PM16/PM30
>EC35-EC44 (EH_CU_1D_AR)	<10 ^{SV}	<10	<10								<10	ug/l	TM5/PM16/PM30
Total aromatics C5-44 (EH_CU+HS_1D_AR)	<10 ^{SV}	<10	<10								<10	ug/l	TM5/PM16/PM30
Total aliphatics and aromatics(C5-44) (EH_CU+HS_1D_Total)	<10 ^{SV}	<10	<10								<10	ug/l	TM5/PM16/PM30
Sulphate as SO ₄ #	10.2	22.2	41.4								<0.5	mg/l	TM38/PM0
Chloride #	95.3	860.5	193.9								<0.3	mg/l	TM38/PM0
Nitrate as NO ₃ #	1.0	2.9	3.5								<0.2	mg/l	TM38/PM0
Free Cyanide #	<0.01	<0.01	<0.01								<0.01	mg/l	TM89/PM0
Total Cyanide #	<0.01	<0.01	<0.01								<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as NH ₄ #	0.92	0.11	0.05								<0.03	mg/l	TM38/PM0
Hexavalent Chromium	<0.006	<0.006	<0.006								<0.006	mg/l	TM38/PM0
Dissolved Organic Carbon #	<2	4	<2								<2	mg/l	TM60/PM0
pH #	7.16	9.74	7.88								<0.01	pH units	TM73/PM0

Element Materials Technology

Client Name:	Waterman Infrastructure & Environment Limited
Reference:	WIE19085
Location:	Rochdale 6th Form College
Contact:	Andrew Mould
EMT Job No:	24/2808

SVOC Report : Liquid

EMT Sample No.	1-9	10-18	19-27								Please see attached notes for all abbreviations and acronyms		
Sample ID	CP02	WS102	CP01										
Depth	4.00	1.00	5.00										
COC No / misc Containers	V H N N P G	V H N N P G	V H N N P G										
Sample Date	16/02/2024 08:00	16/02/2024 08:30	16/02/2024 09:20										
Sample Type	Ground Water	Ground Water	Ground Water										
Batch Number	1	1	1										
Date of Receipt	19/02/2024	19/02/2024	19/02/2024										
SVOC MS													
Phenols													
2-Chlorophenol #	<1	<1	<1								<1	ug/l	TM16/PM30
2-Methylphenol #	<0.5	<0.5	<0.5								<0.5	ug/l	TM16/PM30
2-Nitrophenol	<0.5	<0.5	<0.5								<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol #	<0.5	<0.5	<0.5								<0.5	ug/l	TM16/PM30
2,4-Dimethylphenol	<1	<1	<1								<1	ug/l	TM16/PM30
2,4,5-Trichlorophenol #	<0.5	<0.5	<0.5								<0.5	ug/l	TM16/PM30
2,4,6-Trichlorophenol	<1	<1	<1								<1	ug/l	TM16/PM30
4-Chloro-3-methylphenol #	<0.5	<0.5	<0.5								<0.5	ug/l	TM16/PM30
4-Methylphenol	<1	<1	<1								<1	ug/l	TM16/PM30
4-Nitrophenol	<10	<10	<10								<10	ug/l	TM16/PM30
Pentachlorophenol	<1	<1	<1								<1	ug/l	TM16/PM30
Phenol	<1	<1	<1								<1	ug/l	TM16/PM30
PAHs													
2-Chloronaphthalene #	<1	<1	<1								<1	ug/l	TM16/PM30
2-Methylnaphthalene #	<1	<1	<1								<1	ug/l	TM16/PM30
Naphthalene #	<1	<1	<1								<1	ug/l	TM16/PM30
Acenaphthylene #	<0.5	<0.5	<0.5								<0.5	ug/l	TM16/PM30
Acenaphthene #	<1	<1	<1								<1	ug/l	TM16/PM30
Fluorene #	<0.5	<0.5	<0.5								<0.5	ug/l	TM16/PM30
Phenanthrene #	<0.5	<0.5	<0.5								<0.5	ug/l	TM16/PM30
Anthracene #	<0.5	<0.5	<0.5								<0.5	ug/l	TM16/PM30
Fluoranthene #	<0.5	<0.5	<0.5								<0.5	ug/l	TM16/PM30
Pyrene #	<0.5	<0.5	<0.5								<0.5	ug/l	TM16/PM30
Benzo(a)anthracene #	<0.5	<0.5	<0.5								<0.5	ug/l	TM16/PM30
Chrysene #	<0.5	<0.5	<0.5								<0.5	ug/l	TM16/PM30
Benzo(bk)fluoranthene #	<1	<1	<1								<1	ug/l	TM16/PM30
Benzo(a)pyrene	<1	<1	<1								<1	ug/l	TM16/PM30
Indeno(123cd)pyrene	<1	<1	<1								<1	ug/l	TM16/PM30
Dibenzo(ah)anthracene #	<0.5	<0.5	<0.5								<0.5	ug/l	TM16/PM30
Benzo(ghi)perylene #	<0.5	<0.5	<0.5								<0.5	ug/l	TM16/PM30
Phthalates													
Bis(2-ethylhexyl) phthalate	<5	<5	<5								<5	ug/l	TM16/PM30
Butylbenzyl phthalate	<1	<1	<1								<1	ug/l	TM16/PM30
Di-n-butyl phthalate #	<1.5	<1.5	<1.5								<1.5	ug/l	TM16/PM30
Di-n-Octyl phthalate	<1	<1	<1								<1	ug/l	TM16/PM30
Diethyl phthalate #	<1	<1	<1								<1	ug/l	TM16/PM30
Dimethyl phthalate	<1	<1	<1								<1	ug/l	TM16/PM30

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE19085
Location: Rochdale 6th Form College
Contact: Andrew Mould
EMT Job No: 24/2808

SVOC Report : Liquid

[illegible]

Element Materials Technology

Client Name: Waterman Infrastructure & Environment Limited
Reference: WIE19085
Location: Rochdale 6th Form College
Contact: Andrew Mould
EMT Job No: 24/2808

VOC Report : Liquid

EMT Sample No.	1-9	10-18	19-27								Please see attached notes for all abbreviations and acronyms		
Sample ID	CP02	WS102	CP01										
Depth	4.00	1.00	5.00										
COC No / misc													
Containers	V H N N P G	V H N N P G	V H N N P G										
Sample Date	16/02/2024 08:00	16/02/2024 08:30	16/02/2024 09:20										
Sample Type	Ground Water	Ground Water	Ground Water										
Batch Number	1	1	1								LOD/LOR	Units	Method No.
Date of Receipt	19/02/2024	19/02/2024	19/02/2024										
VOC MS													
Dichlorodifluoromethane	<2	<2	<2								<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1								<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3	<3								<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1	<0.1								<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1								<1	ug/l	TM15/PM10
Chloroethane #	<3	<3	<3								<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3								<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3	<3								<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3	<3	<3								<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3								<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3								<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1								<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Chloroform #	<2	<2	<2								<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2	<2								<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3								<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2								<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5								<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3								<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2	<2								<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3	<3								<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2	<2								<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2								<2	ug/l	TM15/PM10
Toluene #	<5	<5	<5								<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2								<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3								<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2	<2								<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2	<2								<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2	<2								<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2	<2								<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1								<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2	<2								<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1								<1	ug/l	TM15/PM10
Styrene	<2	<2	<2								<2	ug/l	TM15/PM10
Bromoform #	<2	<2	<2								<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4								<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2	<2								<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3	<3								<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3	<3								<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3	<3								<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2								<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3								<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3								<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2								<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3								<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	93	100	100								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	98	101	102								<0	%	TM15/PM10

Contact: Andrew Mould

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 24/2808

SOILS and ASH

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

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).

Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

HWOL ACRONYMS AND OPERATORS USED

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 & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 24/2808

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec.1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec.1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			

EMT Job No: 24/2808

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes			
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			

Appendix C

Environment Agency Letter Ref. SO/2023/123794/02-L01

Appendices

Foundation Works Technical Note
WIE19085-108-TN-6.1.4-CWaters

Rochdale Metropolitan Borough Council
Development Control
Number One Riverside
Smith Street
ROCHDALE
Lancashire
OL16 1XU

Our ref: SO/2023/123794/02-L01
Your ref: 23/01326/DOC
Date: 12 February 2024

Dear Sir/Madam

SUBMISSION OF DETAILS TO COMPLY WITH CONDITIONS 6 (PILING) AND 7 (FLOOR LEVELS) ON PLANNING PERMISSION ROCHDALE SIXTH FORM COLLEGE , COLLEGE ROAD, ROCHDALE, OL12 6HY

Thank you for referring further detail regarding the above application to the Environment Agency.

Environment Agency position

We have reviewed the following reports and do not recommend discharge of condition 6 (Piling). We would wish to make the following comments.

- Foundation Works Risk Assessment, Rochdale Sixth Form College Rochdale, Waterman, November 2023.
- Generic Quantitative Risk Assessment, Rochdale Sixth Form College Rochdale, Waterman, July 2023.

The Foundation Works Risk Assessment (FWRA) proposes the use of pre-formed driven piles to rockhead in the underlying Secondary A aquifer coal measures.

We note that the site investigation carried out in 2023 identified unusually elevated iron concentrations, up to 16mg/l, in groundwater encountered in the sand layer in the drift deposits when compared to the EQS for iron which is 1mg/l.

Puncturing the clay drift, which overlies the bedrock and piling into the upper bedrock may create preferential pathways for contaminated groundwater in the sand horizon to enter the underlying Secondary A aquifer bedrock and present a risk of increased mobilisation, which may affect the River Roch.

Environment Agency
Richard Fairclough House Knutsford Road, Warrington, WA4 1HT.
Customer services line: 03708 506 506
www.gov.uk/environment-agency

Cont/d..

The FWRA proposes carrying out groundwater monitoring during and following the piling works.

Advice to the applicant

We require a round of groundwater sampling to be carried out prior to carrying out the piling works to verify whether the unusually high iron concentrations are truly as high as 16mg/l in CP101 and CP102.

Without this information we cannot recommend discharge of this condition due to the unusually high iron concentrations found in shallow groundwater and risk of breaching the aquitard protecting the underlying Secondary A aquifer.

Once details have been submitted we will be happy to comment further.

Please forward a copy of this letter to the applicant.

Yours faithfully

Mrs. SYLVIA WHITTINGHAM
Planning Advisor

Direct dial 0203 0251059

Direct e-mail sylvia.whittingham@environment-agency.gov.uk