Unit 7-8 Hawarden Business Park
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Socotec
Geotechnical House
18 - 19 Drome Road
Deeside Industrial Park
Deeside
Flintshire
CH5 2NY

Attention: Chris Evans

CERTIFICATE OF ANALYSIS

Date of report Generation:	28 December 2022
Customer:	Socotec
Sample Delivery Group (SDG):	221215-34
Your Reference:	NOR2046
Location:	Shotton Mill
Report No:	673646
Order Number:	CN7679

This report has been revised and directly supersedes 673326 in its entirety.

We received 1 sample on Wednesday December 14, 2022 and 1 of these samples were scheduled for analysis which was completed on Wednesday December 28, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager

1291

CERTIFICATE OF ANALYSIS

SDG: 221215-34 **Report Number:** 673646 **Superseded Report:** 673326
Client Ref.: NOR2046 **Location:** Shotton Mill

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
27315069	W1			14/12/2022

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

Validated

CERTIFICATE OF ANALYSIS

SDG: 221215-34 **Report Number:** 673646 **Superseded Report:** 673326
Client Ref.: NOR2046 **Location:** Shotton Mill

Results Legend

X Test

N No Determination Possible

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

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
			27315069	W1			0.5l glass bottle (ALE227)	TE
							1000ml glass bottle (ALE220)	TE
							250ml BOD (ALE212)	TE
							Vial (ALE297)	TE
BOD True Total	All	NDPs: 0 Tests: 1						
							X	
Chloralkanes C10 - C13 by GCMS	All	NDPs: 0 Tests: 1						
							X	
COD Unfiltered	All	NDPs: 0 Tests: 1						
							X	
Mercury Unfiltered	All	NDPs: 0 Tests: 1						
							X	
Nonylphenol and Octylphenol*	All	NDPs: 0 Tests: 1						
								X
Organotins in Aqueous Samples	All	NDPs: 0 Tests: 1						
							X	
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 1						
								X
Suspended Solids	All	NDPs: 0 Tests: 1						
							X	
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 1						
							X	
Total Metals by ICP-MS	All	NDPs: 0 Tests: 1						
							X	
Total Nitrogen	All	NDPs: 0 Tests: 1						
							X	
VOC MS (W)	All	NDPs: 0 Tests: 1						
								X

CERTIFICATE OF ANALYSIS

SDG: 221215-34 **Report Number:** 673646 **Superseded Report:** 673326
Client Ref.: NOR2046 **Location:** Shotton Mill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

			Customer Sample Ref.					
			W1					
			Depth (m)	.				
			Sample Type	Trade Effluent (TE)				
			Date Sampled	14/12/2022				
			Sample Time	.				
			Date Received	14/12/2022				
			SDG Ref	221215-34				
			Lab Sample No.(s)	27315069				
			AGS Reference					
Component	**LOD/Units**	**Method**						
Chloroalkanes (C10-C13)*	µg/l	SUB	<0.4					
Nonylphenol*	µg/l	SUB	<0.1					
4-t-Octylphenol*	µg/l	SUB	<0.01					
Suspended solids, Total	<2 mg/l	TM022	15.9 #					
BOD, unfiltered	<1 mg/l	TM045	2.6 #					
COD, unfiltered	<7 mg/l	TM107	36.1 #					
Arsenic (tot.unfilt)	<2 µg/l	TM152	<2 2					
Cadmium (tot.unfilt)	<0.5 µg/l	TM152	<0.5 2					
Chromium (tot.unfilt)	<3 µg/l	TM152	6.74 2					
Copper (tot.unfilt)	<1 µg/l	TM152	3.98 2					
Lead (tot.unfilt)	<1 µg/l	TM152	4.27 2					
Manganese (tot.unfilt)	<1 µg/l	TM152	29.2 2					
Nickel (tot.unfilt)	<1 µg/l	TM152	13.9 2					
Phosphorus (tot.unfilt)	<20 µg/l	TM152	637 2					
Zinc (tot.unfilt)	<5 µg/l	TM152	36.4 2					
Iron (Tot. Unfilt.)	<0.024 mg/l	TM152	0.225 2					
Mercury (tot.unfilt)	<0.02 µg/l	TM183	0.0566 2 #					
Nitrogen, Total	<1 mg/l	TM212	7.52 #					
Dibutyl tin	<5 ng/l	TM328	<30					
Tributyl tin	<1 ng/l	TM328	<6					
Tetrabutyl tin	<2 ng/l	TM328	<12					
Triphenyl tin	<1 ng/l	TM328	<6					
Surrogate**	%	TM328	93.9					
Trifluralin	<0.01 µg/l	TM343	<0.01					
alpha-HCH	<0.01 µg/l	TM343	<0.01					
gamma-HCH (Lindane)	<0.01 µg/l	TM343	<0.01					
Heptachlor	<0.01 µg/l	TM343	<0.01					
Aldrin	<0.01 µg/l	TM343	<0.01					
beta-HCH	<0.01 µg/l	TM343	<0.01					
Isodrin	<0.01 µg/l	TM343	<0.01					
delta-HCH	<0.01 µg/l	TM343	<0.01					
Heptachlor epoxide	<0.01 µg/l	TM343	<0.01					
o,p'-DDE	<0.01 µg/l	TM343	<0.01					

CERTIFICATE OF ANALYSIS

SDG: 221215-34 **Report Number:** 673646 **Superseded Report:** 673326
Client Ref.: NOR2046 **Location:** Shotton Mill

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

		Customer Sample Ref.	W1
		Depth (m)	.
		Sample Type	Trade Effluent (TE)
		Date Sampled	14/12/2022
		Sample Time	.
		Date Received	14/12/2022
		SDG Ref	221215-34
		Lab Sample No.(s)	27315069
		AGS Reference	
Component	**LOD/Units**	**Method**	
Endosulphan I	<0.01 µg/l	TM343	<0.01
trans-Chlordane	<0.01 µg/l	TM343	<0.01
cis-Chlordane	<0.01 µg/l	TM343	<0.01
p,p'-DDE	<0.01 µg/l	TM343	<0.01
Dieldrin	<0.01 µg/l	TM343	<0.01
o,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01
Endrin	<0.01 µg/l	TM343	<0.01
o,p'-DDT	<0.01 µg/l	TM343	<0.02
p,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01
Endosulphan II	<0.02 µg/l	TM343	<0.02
p,p'-DDT	<0.01 µg/l	TM343	<0.05
o,p'-Methoxychlor	<0.01 µg/l	TM343	<0.02
p,p'-Methoxychlor	<0.01 µg/l	TM343	<0.02
Endosulphan Sulphate	<0.02 µg/l	TM343	<0.02
Permethrin I	<0.01 µg/l	TM343	<0.01
Permethrin II	<0.01 µg/l	TM343	<0.01

CERTIFICATE OF ANALYSIS

SDG: 221215-34 **Report Number:** 673646 **Superseded Report:** 673326
Client Ref.: NOR2046 **Location:** Shotton Mill

SVOC MS (W) - Aqueous

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Customer Sample Ref.	W1
Depth (m)	.
Sample Type	Trade Effluent (TE)
Date Sampled	14/12/2022
Sample Time	.
Date Received	14/12/2022
SDG Ref	221215-34
Lab Sample No.(s)	27315069
AGS Reference	

Component	LOD/Units	Method	
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<1
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<1
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<1
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1
2-Chlorophenol (aq)	<1 µg/l	TM176	<1
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1
2-Methylphenol (aq)	<1 µg/l	TM176	<1
2-Nitroaniline (aq)	<1 µg/l	TM176	<1
2-Nitrophenol (aq)	<1 µg/l	TM176	<1
3-Nitroaniline (aq)	<1 µg/l	TM176	<1
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<1
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<1
4-Chloroaniline (aq)	<1 µg/l	TM176	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<1
4-Methylphenol (aq)	<1 µg/l	TM176	<1
4-Nitroaniline (aq)	<1 µg/l	TM176	<1
4-Nitrophenol (aq)	<1 µg/l	TM176	<1
Azobenzene (aq)	<1 µg/l	TM176	<1
Acenaphthylene (aq)	<1 µg/l	TM176	<1
Acenaphthene (aq)	<1 µg/l	TM176	<1
Anthracene (aq)	<1 µg/l	TM176	<1
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<1
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<2
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<1

CERTIFICATE OF ANALYSIS

SDG: 221215-34 **Report Number:** 673646 **Superseded Report:** 673326
Client Ref.: NOR2046 **Location:** Shotton Mill

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

		Customer Sample Ref.	W1
		Depth (m)	.
		Sample Type	Trade Effluent (TE)
		Date Sampled	14/12/2022
		Sample Time	.
		Date Received	14/12/2022
		SDG Ref	221215-34
		Lab Sample No.(s)	27315069
		AGS Reference	
Component	**LOD/Units**	**Method**	
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	<1
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<1
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<1
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<1
Carbazole (aq)	<1 µg/l	TM176	<1
Chrysene (aq)	<1 µg/l	TM176	<1
Dibenzofuran (aq)	<1 µg/l	TM176	<1
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<1
Diethyl phthalate (aq)	<1 µg/l	TM176	<1
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<1
Dimethyl phthalate (aq)	<1 µg/l	TM176	<1
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<5
Fluoranthene (aq)	<1 µg/l	TM176	<1
Fluorene (aq)	<1 µg/l	TM176	<1
Hexachlorobenzene (aq)	<1 µg/l	TM176	<1
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<1
Pentachlorophenol (aq)	<1 µg/l	TM176	<1
Phenol (aq)	<1 µg/l	TM176	<1
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<1
Hexachloroethane (aq)	<1 µg/l	TM176	<1
Nitrobenzene (aq)	<1 µg/l	TM176	<1
Naphthalene (aq)	<1 µg/l	TM176	<1
Isophorone (aq)	<1 µg/l	TM176	<1
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<1
Phenanthrene (aq)	<1 µg/l	TM176	<1
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	<1
Pyrene (aq)	<1 µg/l	TM176	<1

CERTIFICATE OF ANALYSIS

SDG: 221215-34 **Report Number:** 673646 **Superseded Report:** 673326
Client Ref.: NOR2046 **Location:** Shotton Mill

VOC MS (W)

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Customer Sample Ref.	W1
Depth (m)	.
Sample Type	Trade Effluent (TE)
Date Sampled	14/12/2022
Sample Time	.
Date Received	14/12/2022
SDG Ref	221215-34
Lab Sample No.(s)	27315069
AGS Reference	

Component	LOD/Units	Method	
Dibromofluoromethane**	%	TM208	112
Toluene-d8**	%	TM208	99.5
4-Bromofluorobenzene**	%	TM208	96
Dichlorodifluoromethane	<1 µg/l	TM208	<1 #
Chloromethane	<1 µg/l	TM208	<1 #
Vinyl chloride	<1 µg/l	TM208	<1 #
Bromomethane	<1 µg/l	TM208	<1 #
Chloroethane	<1 µg/l	TM208	<1 #
Trichlorofluoromethane	<1 µg/l	TM208	<1 #
1,1-Dichloroethene	<1 µg/l	TM208	<1 #
Carbon disulphide	<1 µg/l	TM208	<1 #
Dichloromethane	<3 µg/l	TM208	<3 #
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1 #
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1 #
1,1-Dichloroethane	<1 µg/l	TM208	<1 #
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1 #
2,2-Dichloropropane	<1 µg/l	TM208	<1
Bromochloromethane	<1 µg/l	TM208	<1 #
Chloroform	<1 µg/l	TM208	<1 #
1,1,1-Trichloroethane	<1 µg/l	TM208	<1 #
1,1-Dichloropropene	<1 µg/l	TM208	<1 #
Carbontetrachloride	<1 µg/l	TM208	<1 #
1,2-Dichloroethane	<1 µg/l	TM208	<1 #
Benzene	<1 µg/l	TM208	<1 #
Trichloroethene	<1 µg/l	TM208	<1 #
1,2-Dichloropropane	<1 µg/l	TM208	<1 #
Dibromomethane	<1 µg/l	TM208	<1 #
Bromodichloromethane	<1 µg/l	TM208	<1 #
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1 #
Toluene	<1 µg/l	TM208	<1 #
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1 #
1,1,2-Trichloroethane	<1 µg/l	TM208	<1 #
1,3-Dichloropropane	<1 µg/l	TM208	<1 #

CERTIFICATE OF ANALYSIS

SDG: 221215-34 **Report Number:** 673646 **Superseded Report:** 673326
Client Ref.: NOR2046 **Location:** Shotton Mill

VOC MS (W)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Customer Sample Ref.	W1
Depth (m)	.
Sample Type	Trade Effluent (TE)
Date Sampled	14/12/2022
Sample Time	.
Date Received	14/12/2022
SDG Ref	221215-34
Lab Sample No.(s)	27315069
AGS Reference	

Component	LOD/Units	Method	
Tetrachloroethene	<1 µg/l	TM208	<1 #
Dibromochloromethane	<1 µg/l	TM208	<1 #
1,2-Dibromoethane	<1 µg/l	TM208	<1 #
Chlorobenzene	<1 µg/l	TM208	<1 #
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1 #
Ethylbenzene	<1 µg/l	TM208	<1 #
m,p-Xylene	<1 µg/l	TM208	<1 #
o-Xylene	<1 µg/l	TM208	<1 #
Styrene	<1 µg/l	TM208	<1 #
Bromoform	<1 µg/l	TM208	<1 #
Isopropylbenzene	<1 µg/l	TM208	<1 #
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1 #
1,2,3-Trichloropropane	<1 µg/l	TM208	<1 #
Bromobenzene	<1 µg/l	TM208	<1 #
Propylbenzene	<1 µg/l	TM208	<1 #
2-Chlorotoluene	<1 µg/l	TM208	<1 #
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1 #
4-Chlorotoluene	<1 µg/l	TM208	<1 #
tert-Butylbenzene	<1 µg/l	TM208	<1 #
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1 #
sec-Butylbenzene	<1 µg/l	TM208	<1 #
4-iso-Propyltoluene	<1 µg/l	TM208	<1 #
1,3-Dichlorobenzene	<1 µg/l	TM208	<1 #
1,4-Dichlorobenzene	<1 µg/l	TM208	<1 #
n-Butylbenzene	<1 µg/l	TM208	<1 #
1,2-Dichlorobenzene	<1 µg/l	TM208	<1 #
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1 #
Hexachlorobutadiene	<1 µg/l	TM208	<1 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1 #
Naphthalene	<1 µg/l	TM208	<1 #
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1 #
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1

Table of Results - Appendix

Method No	Reference	Description
SUB		Subcontracted Test
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
TM045	MEWAM BOD5 2nd Ed.HMSO 1988 / Method 5210B, AWWA/APHA, 20th Ed., 1999; SCA Blue Book 130	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM212	SO/TR 11905-2: 1997. Water quality – Determination of nitrogen – Part 2:Determination of bound nitrogen, after combustion and oxidation to nitrogen dioxide, chemiluminescence detection.	Determination of Total Nitrogen by High Temperature Catalytic Oxidation followed by Chemiluminescence Detection
TM328		
TM343	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of Selected Pesticides (Suite I) in Liquids by GCMS

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

CERTIFICATE OF ANALYSIS

SDG: 221215-34 **Report Number:** 673646 **Superseded Report:** 673326
Client Ref.: NOR2046 **Location:** Shotton Mill

Test Completion Dates

Lab Sample No(s)	27315069
Customer Sample Ref.	W1
AGS Ref.	
Depth	
Type	Trade Effluent
BOD True Total	21-Dec-2022
Chloralkanes C10 - C13 by GCMS	28-Dec-2022
COD Unfiltered	20-Dec-2022
Mercury Unfiltered	21-Dec-2022
Nonylphenol and Octylphenol*	28-Dec-2022
Organotins in Aqueous Samples	22-Dec-2022
Pesticides (Suite I) by GCMS	20-Dec-2022
Suspended Solids	20-Dec-2022
SVOC MS (W) - Aqueous	22-Dec-2022
Total Metals by ICP-MS	22-Dec-2022
Total Nitrogen	19-Dec-2022
VOC MS (W)	15-Dec-2022

CERTIFICATE OF ANALYSIS

Work Order	: **PR22D1408**	Issue Date	: 28-Dec-2022
Customer	: **ALS Laboratories (UK) Limited**	Laboratory	: ALS Czech Republic, s.r.o.
Contact	: ALS Hawarden Reporting	Contact	: Client Service
Address	: Unit 7-8 Hawarden Business Park Manor Road, Hawarden CH5 3US Deeside	Address	: Na Harfe 336/9 Prague 9 - Vysocany 190 00 Czech Republic
E-mail	: euhdnsubconresults@ALSGlobal.com	E-mail	: customer.support@alsglobal.com
Telephone	: ----	Telephone	: +420 226 226 228
Project	: 221215-34	Page	: 1 of 2
Order number	: ----	Date Samples Received	: 20-Dec-2022
		Quote number	: PR2022ALSEC-GB0002 (CZ-256-18-0022)
Site	: ----	Date of test	: 20-Dec-2022 - 28-Dec-2022
Sampled by	: client	QC Level	: ALS CR Standard Quality Control Schedule

General Comments

This report shall not be reproduced except in full, without prior written approval from the laboratory.

The laboratory declares that the test results relate only to the listed samples. If the section "Sampled by" of the Certificate of analysis states: "Sampled by Customer" then the results relate to the sample as received.

Responsible for accuracy

Testing Laboratory No. 1163
Accredited by CAI according to
CSN EN ISO/IEC 17025:2018

Signatories	*Position*
Lubomír Pokorný	Country Manager

The company is certified according to ČSN EN ISO 14001 (Environmental management systems) and ČSN ISO 45001 (Occupational health and safety management systems)

Analytical Results

Sub-Matrix: **EFFLUENT**

	Client sample ID	27320301 W1		27320315 W1		----	
	Laboratory sample ID	PR22D1408001		PR22D1408002		----	
	Client sampling date / time	15-Dec-2022 14:48		15-Dec-2022 14:50		----	
Parameter	Method	LOR	Unit	Result	MU	Result	MU	Result	MU
Chlorinated Hydrocarbons									
Chlorinated Alkanes C10-C13	W-CLAGMS01	0.40	µg/L	**----**	----	<0.40	----	**----**	----
Alkylphenols									
4-n-Octylphenol	W-AEOGMS01	0.100	µg/L	<0.100	----	**----**	----	**----**	----
4-Nonylphenol	W-AEOGMS01	0.100	µg/L	<0.100	----	**----**	----	**----**	----
4-t-Octylphenol	W-AEOGMS01	0.010	µg/L	<0.010	----	**----**	----	**----**	----
4-t-Octylphenol diethoxylate	W-AEOGMS01	0.010	µg/L	<0.010	----	**----**	----	**----**	----
4-t-Octylphenol monoethoxylate	W-AEOGMS01	0.010	µg/L	<0.010	----	**----**	----	**----**	----
4-t-Octylphenol triethoxylate	W-AEOGMS01	0.010	µg/L	<0.010	----	**----**	----	**----**	----
Nonylphenol (mixture of isomers)	W-AEOGMS01	0.100	µg/L	<0.100	----	**----**	----	**----**	----
Nonylphenol diethoxylate (mixture of isomers)	W-AEOGMS01	0.100	µg/L	<0.100	----	**----**	----	**----**	----
Nonylphenol monoethoxylate (mixture of isomers)	W-AEOGMS01	0.100	µg/L	<0.100	----	**----**	----	**----**	----
Nonylphenol triethoxylate (mixture of isomers)	W-AEOGMS01	0.100	µg/L	<0.100	----	**----**	----	**----**	----
Sum of 4 NP and NPE	W-AEOGMS01	0.40	µg/L	<0.40	----	**----**	----	**----**	----
Sum of 5 NP and NPE	W-AEOGMS01	0.500	µg/L	<0.500	----	**----**	----	**----**	----
Sum of 5 OP and OPE	W-AEOGMS01	0.140	µg/L	<0.140	----	**----**	----	**----**	----

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor k = 2, representing 95% confidence level.
Key: LOR = Limit of reporting; MU = Measurement Uncertainty. The MU does not include sampling uncertainty.

The end of result part of the certificate of analysis

Brief Method Summaries

Analytical Methods	Method Descriptions
Location of test performance: Na Harfe 336/9 Prague 9 - Vysocany Czech Republic 190 00	
W-AEOGMS01	CZ_SOP_D06_03_178 (CSN EN ISO 18857-2) Determination of alkylphenols and alkylphenol ethoxylates by gas chromatography method with MS or MS/MS detection and calculation of alkylphenols and alkylphenol ethoxylates sums from measured values
W-CLAGMS01	CZ_SOP_D06_03_192.A - (CSN EN ISO 12010) Determination of chlorinated alkanes by gas chromatography method with MS/MS detection

The symbol "*" for the method indicates a test outside the scope of accreditation of the laboratory or subcontractor. If the UNICO-SUB code is stated in the method table, this only informs that the tests have been performed by a subcontractor and the results are given in an annex to the test report, including information on test accreditation. If the lab used for matrix outside the scope of accreditation or non-standard sample matrix procedure specified in the accredited method and issues non-accredited results, this fact is stated on the title page of this protocol in the section "Notes". If the test report shows the results of subcontracting, the place of performance of the test is outside the laboratories of ALS Czech Republic, s.r.o.
The method for calculating of the summation parameters is available on request in the customer service.

SDG:	221215-34	**Report Number:**	673646	**Superseded Report:**	673326
Client Ref:	NOR2046	**Location:**	Shotton Mill		

Appendix

General

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

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

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

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

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

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

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

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

19. **Sample Deviations**

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

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

20. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials andd soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

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

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