

Appendix 9.6

Surface Water and Ground Water Laboratory Results

Coolglass Wind Farm EIAR Volume 3

Coolglass Wind Farm Limited

SLR Project No.: 501.V00727.00006

07 June 2023



SLR Consulting Ireland
CSA House
Unit 7
Dundrum Business Park
Windy Harbour
Dublin
Dublin14

Attention: Orlaith Tyrrell

CERTIFICATE OF ANALYSIS

Date of report Generation: 14 September 2022
Customer: SLR Consulting Ireland
Sample Delivery Group (SDG): 220907-99
Your Reference: 501.00727.00006
Location: Coolglass, Co. Laois
Report No: 661113
Order Number: 8135

We received 1 sample on Wednesday September 07, 2022 and 1 of these samples were scheduled for analysis which was completed on Wednesday September 14, 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 Life Sciences Ltd 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 220907-99
Client Ref.: 501.00727.00006

Report Number: 661113
Location: Coolglass, Co. Laois

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26841491	BH T2		0.00 - 0.00	05/09/2022

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 220907-99
Client Ref.: 501.00727.00006

Report Number: 661113
Location: Coolglass, Co. Laois

Superseded Report:

Results Legend <div style="display: flex; flex-direction: column; gap: 5px;"> <div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: yellow; border: 1px solid black; margin-right: 5px;"></div> Test </div> <div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: red; color: white; border: 1px solid black; margin-right: 5px;"></div> No Determination Possible </div> </div> 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		Znac (ALE246)	Vial (ALE297)	NaOH (ALE245)	HNO3 Filtered (ALE204)	H2SO4 (ALE244)	330ml plastic bottle (ALE503)	0.5l glass bottle (ALE227)
	Sample Type		GW	GW	GW	GW	GW	GW	GW
Ammonium Low	All	NDPs: 0 Tests: 1			X				
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X						
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1			X				
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 1	X						
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 1	X						
GRO by GC-FID (W)	All	NDPs: 0 Tests: 1						X	
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1			X				
Mercury Dissolved	All	NDPs: 0 Tests: 1			X				
pH Value	All	NDPs: 0 Tests: 1	X						
Phosphate by Kone (w)	All	NDPs: 0 Tests: 1	X						
Sulphide	All	NDPs: 0 Tests: 1						X	
TPH CWG (W)	All	NDPs: 0 Tests: 1	X						
VOC MS (W)	All	NDPs: 0 Tests: 1						X	



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SDG: 220907-99
Client Ref.: 501.00727.00006

Report Number: 661113
Location: Coolglass, Co. Laois

Superseded Report:

Results Legend		Customer Sample Ref.	BH T2			
#	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)					
		Depth (m)	0.00 - 0.00			
		Sample Type	Ground Water (GW)			
		Date Sampled	05/09/2022			
		Sample Time				
		Date Received	07/09/2022			
		SDG Ref	220907-99			
		Lab Sample No.(s)	26841491			
		AGS Reference				
Component	LOD/Units	Method				
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099	0.051	#		
Ammoniacal Nitrogen Low as NH4	<0.01 mg/l	TM099	0.0656	#		
Sulphide	<0.01 mg/l	TM101	<0.01	#		
Aluminium (diss.filt)	<10 µg/l	TM152	<10	#		
Arsenic (diss.filt)	<0.5 µg/l	TM152	<0.5	#		
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	#		
Chromium (diss.filt)	<1 µg/l	TM152	<1	#		
Copper (diss.filt)	<0.3 µg/l	TM152	<0.3	#		
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2	#		
Nickel (diss.filt)	<0.4 µg/l	TM152	<0.4	#		
Zinc (diss.filt)	<1 µg/l	TM152	11.6	#		
Iron (Dis.Filt)	<0.019 mg/l	TM152	2.24	#		
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	#		
Sulphate	<2 mg/l	TM184	6.1	#		
Chloride	<2 mg/l	TM184	15.9	#		
Phosphate (Ortho as P)	<0.02 mg/l	TM184	<0.02	#		
Nitrate as NO3	<0.3 mg/l	TM184	<0.3	#		
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	<0.1	#		
pH	<1 pH Units	TM256	7.02	#		
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256	0.349	#		
Cyanide, Total (low level)	<5 µg/l	TM279	<5	#		
Cyanide, Free (low level)	<2.5 µg/l	TM279	<2.5	#		



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Location: Coolglass, Co. Laois

Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM279		Determination of Low Level Easily Liberatable (Free) Cyanides and Total Cyanides in Waters using the Skalar SANS+ System Segmented Flow Analyser

NA = not applicable.

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



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Report Number: 661113
Location: Coolglass, Co. Laois

Superseded Report:

Test Completion Dates

Lab Sample No(s)	26841491
Customer Sample Ref.	BH T2
AGS Ref.	
Depth	0.00 - 0.00
Type	Ground Water

Ammonium Low	13-Sep-2022
Anions by Kone (w)	09-Sep-2022
Dissolved Metals by ICP-MS	12-Sep-2022
EPH CWG (Aliphatic) Aqueous GC (W)	14-Sep-2022
EPH CWG (Aromatic) Aqueous GC (W)	14-Sep-2022
GRO by GC-FID (W)	09-Sep-2022
Low Level Cyanide (W)	09-Sep-2022
Mercury Dissolved	12-Sep-2022
Nitrite by Kone (w)	08-Sep-2022
pH Value	12-Sep-2022
Phosphate by Kone (w)	09-Sep-2022
Sulphide	12-Sep-2022
TPH CWG (W)	14-Sep-2022
VOC MS (W)	08-Sep-2022



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Superseded Report:

Appendix

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

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

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

12. 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.

General

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 and 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.



Unit 7-8 Hawarden Business Park

Manor Road (off Manor Lane)

Hawarden

Deeside

CH5 3US

Tel: (01244) 528777

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

SLR Consulting Ireland
CSA House
Unit 7
Dundrum Business Park
Windy Harbour
Dublin
Dublin14

Attention: Orlaith Tyrrell

CERTIFICATE OF ANALYSIS

Date of report Generation: 30 March 2023
Customer: SLR Consulting Ireland
Sample Delivery Group (SDG): 230320-84
Your Reference: 501.00727.00006
Location: Coolglass, Co. Laois
Report No: 684192
Order Number:

We received 17 samples on Monday March 20, 2023 and 17 of these samples were scheduled for analysis which was completed on Thursday March 30, 2023. 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





CERTIFICATE OF ANALYSIS

Validated

SDG: 230320-84
Client Ref.: 501.00727.00006

Report Number: 684192
Location: Coolglass, Co. Laos

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
27709116	1		0.00 - 0.00	15/03/2023
27709124	2		0.00 - 0.00	15/03/2023
27709132	3		0.00 - 0.00	15/03/2023
27709140	4		0.00 - 0.00	15/03/2023
27709148	5		0.00 - 0.00	15/03/2023
27709156	6		0.00 - 0.00	15/03/2023
27709164	7		0.00 - 0.00	15/03/2023
27709172	8		0.00 - 0.00	15/03/2023
27709180	9		0.00 - 0.00	15/03/2023
27709189	10		0.00 - 0.00	15/03/2023
27709198	11		0.00 - 0.00	15/03/2023
27709206	12		0.00 - 0.00	15/03/2023
27709214	13		0.00 - 0.00	16/03/2023
27709222	14		0.00 - 0.00	16/03/2023
27709230	15		0.00 - 0.00	16/03/2023
27709239	16		0.00 - 0.00	16/03/2023
27709249	17		0.00 - 0.00	16/03/2023

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 230320-84
Client Ref.: 501.00727.00006

Report Number: 684192
Location: Coolglass, Co. Laois

Superseded Report:

Results Legend	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type																																				
	X Test	No Determination Possible																																													
<p>Sample Types -</p> <ul style="list-style-type: none"> 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 																																															
			27709116	1	27709124	2	27709132	3	27709140	4	0.00 - 0.00																																				
			0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00																																				
			H2SO4 (ALE244)	500ml Plastic (ALE208)	250ml BOD (ALE212)	250ml Amber Gl. PTFE/PE (ALE219)	Vial (ALE297)	H2SO4 (ALE244)	500ml Plastic (ALE208)	250ml BOD (ALE212)	250ml Amber Gl. PTFE/PE (ALE219)	Vial (ALE297)	H2SO4 (ALE244)	500ml Plastic (ALE208)	250ml BOD (ALE212)	250ml Amber Gl. PTFE/PE (ALE219)	Vial (ALE297)	H2SO4 (ALE244)	500ml Plastic (ALE208)	250ml BOD (ALE212)	250ml Amber Gl. PTFE/PE (ALE219)	Vial (ALE297)	H2SO4 (ALE244)	500ml Plastic (ALE208)	250ml BOD (ALE212)	250ml Amber Gl. PTFE/PE (ALE219)	Vial (ALE297)	H2SO4 (ALE244)	500ml Plastic (ALE208)	250ml BOD (ALE212)	250ml Amber Gl. PTFE/PE (ALE219)	Vial (ALE297)	H2SO4 (ALE244)	500ml Plastic (ALE208)	250ml BOD (ALE212)	250ml Amber Gl. PTFE/PE (ALE219)	Vial (ALE297)	H2SO4 (ALE244)	500ml Plastic (ALE208)	250ml BOD (ALE212)	250ml Amber Gl. PTFE/PE (ALE219)	Vial (ALE297)	H2SO4 (ALE244)	500ml Plastic (ALE208)	250ml BOD (ALE212)	250ml Amber Gl. PTFE/PE (ALE219)	Vial (ALE297)
			SW	SW	SW	SW	SW	SW	SW	SW	SW																																				
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 17		X		X		X		X	X																																				
Anions by Kone (w)	All	NDPs: 0 Tests: 17		X		X		X		X	X																																				
BOD True Total	All	NDPs: 0 Tests: 17		X		X		X		X	X																																				
COD Unfiltered	All	NDPs: 0 Tests: 17		X		X		X		X	X																																				
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 17	X		X		X		X		X																																				
GRO by GC-FID (W)	All	NDPs: 0 Tests: 17		X		X		X		X	X																																				
pH Value	All	NDPs: 0 Tests: 17		X		X		X		X	X																																				
Phosphate by Kone (w)	All	NDPs: 0 Tests: 17		X		X		X		X	X																																				
Suspended Solids	All	NDPs: 0 Tests: 17		X		X		X		X	X																																				
Total EPH (aq)	All	NDPs: 0 Tests: 17	X		X		X		X		X																																				
Total Metals by ICP-MS	All	NDPs: 0 Tests: 17	X		X		X		X		X																																				
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 17		X		X		X		X	X																																				
Turbidity in waters	All	NDPs: 0 Tests: 17		X		X		X		X	X																																				
VOC MS (W)	All	NDPs: 0 Tests: 17		X		X		X		X	X																																				



CERTIFICATE OF ANALYSIS

Validated

SDG: 230320-84
Client Ref.: 501.00727.00006

Report Number: 684192
Location: Coolglass, Co. Laois

Superseded Report:

Results Legend	Lab Sample No(s)						
	Customer Sample Reference						
	AGS Reference						
<p>Sample Types -</p> <ul style="list-style-type: none"> 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 	Depth (m)						
	Container	PTFE/PE (ALE219)	250ml Amber Gl. (ALE212)	250ml BOD (ALE208)	500ml Plastic (ALE208)	H2SO4 (ALE244)	Vial (ALE297)
	Sample Type	SW	SW	SW	SW	SW	
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 17				X	
Anions by Kone (w)	All	NDPs: 0 Tests: 17		X			
BOD True Total	All	NDPs: 0 Tests: 17	X				
COD Unfiltered	All	NDPs: 0 Tests: 17		X			
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 17	X				
GRO by GC-FID (W)	All	NDPs: 0 Tests: 17					X
pH Value	All	NDPs: 0 Tests: 17		X			
Phosphate by Kone (w)	All	NDPs: 0 Tests: 17		X			
Suspended Solids	All	NDPs: 0 Tests: 17		X			
Total EPH (aq)	All	NDPs: 0 Tests: 17	X				
Total Metals by ICP-MS	All	NDPs: 0 Tests: 17		X			
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 17				X	
Turbidity in waters	All	NDPs: 0 Tests: 17		X			
VOC MS (W)	All	NDPs: 0 Tests: 17					X



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Validated

SDG: 230320-84
Client Ref.: 501.00727.00006

Report Number: 684192
Location: Coolglass, Co. Laois

Superseded Report:

Results Legend		Customer Sample Ref.	13	14	15	16	17	
#	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)							
		Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	
		Sample Type	Surface Water (SW)					
		Date Sampled	16/03/2023	16/03/2023	16/03/2023	16/03/2023	16/03/2023	
		Sample Time						
		Date Received	20/03/2023	20/03/2023	20/03/2023	20/03/2023	20/03/2023	
		SDG Ref	230320-84	230320-84	230320-84	230320-84	230320-84	
		Lab Sample No.(s)	27709214	27709222	27709230	27709239	27709249	
		AGS Reference						
Component	LOD/Units	Method						
Suspended solids, Total	<2 mg/l	TM022	9	15.3	18.6	26.4	22.6	
			#	#	#	#	#	
BOD, unfiltered	<1 mg/l	TM045	<1	<1	<1	1.98	2.13	
			#	#	#	#	#	
Organic Carbon, Total	<3 mg/l	TM090	14.3	11.8	12.5	12.9	12.2	
			#	#	#	#	#	
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2	<0.2	<0.2	<0.2	<0.2	
			#	#	#	#	#	
COD, unfiltered	<7 mg/l	TM107	47.9	47.4	42.2	57.8	44.7	
			#	#	#	#	#	
Phosphorus (tot.unfilt)	<20 µg/l	TM152	92.3	47.5	58.9	108	79.9	
			2 #	2 #	2 #	2 #	2 #	
EPH Range >C10 - C40 (aq)	<100 µg/l	TM172	121	<100	109	<100	106	
			#	#	#	#	#	
Total EPH (C6-C40) (aq)	<100 µg/l	TM172	121	<100	109	<100	106	
			#	#	#	#	#	
Phosphate (Ortho as P)	<0.02 mg/l	TM184	0.0251	<0.02	<0.02	<0.02	<0.02	
			#	#	#	#	#	
Nitrate as NO3	<0.3 mg/l	TM184	0.582	4.56	4.06	3.53	3.73	
			#	#	#	#	#	
Turbidity	<0.1 ntu	TM195	6.33	11.1	15.5	23.1	19.2	
			@ #	@ #	@ #	@ #	@ #	
pH	<1 pH Units	TM256	7.39	7.29	7.52	7.54	7.54	
			#	#	#	#	#	
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256	0.0587	0.122	0.12	0.118	0.119	
			#	#	#	#	#	



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VOC MS (W)

Results Legend		Customer Sample Ref.	13	14	15	16	17	
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.	Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	
diss.filt	Dissolved / filtered sample.	Sample Type	Surface Water (SW)					
tot.unfilt	Total / unfiltered sample.	Date Sampled	16/03/2023	16/03/2023	16/03/2023	16/03/2023	16/03/2023	
	* Subcontracted - refer to subcontractor report for accreditation status.	Sample Time						
	** % 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	Date Received	20/03/2023	20/03/2023	20/03/2023	20/03/2023	20/03/2023	
	(F) Trigger breach confirmed	SDG Ref	230320-84	230320-84	230320-84	230320-84	230320-84	
1-4*\$@	Sample deviation (see appendix)	Lab Sample No.(s)	27709214	27709222	27709230	27709239	27709249	
		AGS Reference						
Component	LOD/Units	Method						
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	<1	<1	<1	
			#	#	#	3 #	#	
Benzene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
			#	#	#	3 #	#	
Toluene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
			#	#	#	3 #	#	
Ethylbenzene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
			#	#	#	3 #	#	
m,p-Xylene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
			#	#	#	3 #	#	
o-Xylene	<1 µg/l	TM208	<1	<1	<1	<1	<1	
			#	#	#	3 #	#	
Sum of BTEX	<5 µg/l	TM208	<5	<5	<5	<5	<5	
						3		



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Table of Results - Appendix

Method No	Description
TM022	Determination of total suspended solids in waters
TM045	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids
TM090	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	Determination of Ammonium in Water Samples using the Kone Analyser
TM107	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM152	Analysis of Aqueous Samples by ICP-MS
TM172	EPH in Waters
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM195	Determination of Turbidity in Waters & Associated Matrices
TM208	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM245	Determination of GRO by Headspace in waters
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples

NA = not applicable.

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



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Test Completion Dates

Lab Sample No(s)	27709116	27709124	27709132	27709140	27709148	27709156	27709164	27709172	27709180	27709189
Customer Sample Ref.	1	2	3	4	5	6	7	8	9	10
AGS Ref.										
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Surface Water									
Ammoniacal Nitrogen	24-Mar-2023									
Anions by Kone (w)	24-Mar-2023	25-Mar-2023	25-Mar-2023	25-Mar-2023	24-Mar-2023	24-Mar-2023	30-Mar-2023	25-Mar-2023	25-Mar-2023	30-Mar-2023
BOD True Total	27-Mar-2023	27-Mar-2023	27-Mar-2023	27-Mar-2023	27-Mar-2023	27-Mar-2023	23-Mar-2023	23-Mar-2023	23-Mar-2023	23-Mar-2023
COD Unfiltered	27-Mar-2023									
EPH (DRO) (C10-C40) Aqueous (W)	27-Mar-2023									
GRO by GC-FID (W)	22-Mar-2023									
Nitrite by Kone (w)	21-Mar-2023	21-Mar-2023	21-Mar-2023	21-Mar-2023	21-Mar-2023	21-Mar-2023	25-Mar-2023	25-Mar-2023	25-Mar-2023	25-Mar-2023
pH Value	22-Mar-2023	23-Mar-2023	22-Mar-2023	22-Mar-2023						
Phosphate by Kone (w)	21-Mar-2023	23-Mar-2023	21-Mar-2023	21-Mar-2023						
Suspended Solids	21-Mar-2023	27-Mar-2023	21-Mar-2023	21-Mar-2023						
Total EPH (aq)	27-Mar-2023									
Total Metals by ICP-MS	28-Mar-2023	27-Mar-2023	27-Mar-2023	27-Mar-2023	27-Mar-2023	28-Mar-2023	28-Mar-2023	24-Mar-2023	28-Mar-2023	28-Mar-2023
Total Organic and Inorganic Carbon	21-Mar-2023									
Turbidity in waters	21-Mar-2023	23-Mar-2023	21-Mar-2023	21-Mar-2023						
VOC MS (W)	23-Mar-2023									

Lab Sample No(s)	27709198	27709206	27709214	27709222	27709230	27709239	27709249
Customer Sample Ref.	11	12	13	14	15	16	17
AGS Ref.							
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Surface Water						
Ammoniacal Nitrogen	24-Mar-2023						
Anions by Kone (w)	25-Mar-2023						
BOD True Total	23-Mar-2023						
COD Unfiltered	27-Mar-2023						
EPH (DRO) (C10-C40) Aqueous (W)	27-Mar-2023						
GRO by GC-FID (W)	22-Mar-2023						
Nitrite by Kone (w)	25-Mar-2023	25-Mar-2023	21-Mar-2023	21-Mar-2023	21-Mar-2023	21-Mar-2023	21-Mar-2023
pH Value	23-Mar-2023	22-Mar-2023	22-Mar-2023	22-Mar-2023	22-Mar-2023	22-Mar-2023	22-Mar-2023
Phosphate by Kone (w)	23-Mar-2023	21-Mar-2023	21-Mar-2023	21-Mar-2023	21-Mar-2023	21-Mar-2023	21-Mar-2023
Suspended Solids	27-Mar-2023	21-Mar-2023	21-Mar-2023	21-Mar-2023	21-Mar-2023	21-Mar-2023	21-Mar-2023
Total EPH (aq)	27-Mar-2023						
Total Metals by ICP-MS	24-Mar-2023	28-Mar-2023	28-Mar-2023	28-Mar-2023	28-Mar-2023	28-Mar-2023	28-Mar-2023
Total Organic and Inorganic Carbon	21-Mar-2023						
Turbidity in waters	23-Mar-2023	21-Mar-2023	21-Mar-2023	21-Mar-2023	21-Mar-2023	21-Mar-2023	21-Mar-2023
VOC MS (W)	23-Mar-2023	23-Mar-2023	23-Mar-2023	23-Mar-2023	23-Mar-2023	22-Mar-2023	22-Mar-2023



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Appendix

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

2. If sufficient sample is received a sub sample will be retained free of charge for 15 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.

General

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 and 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

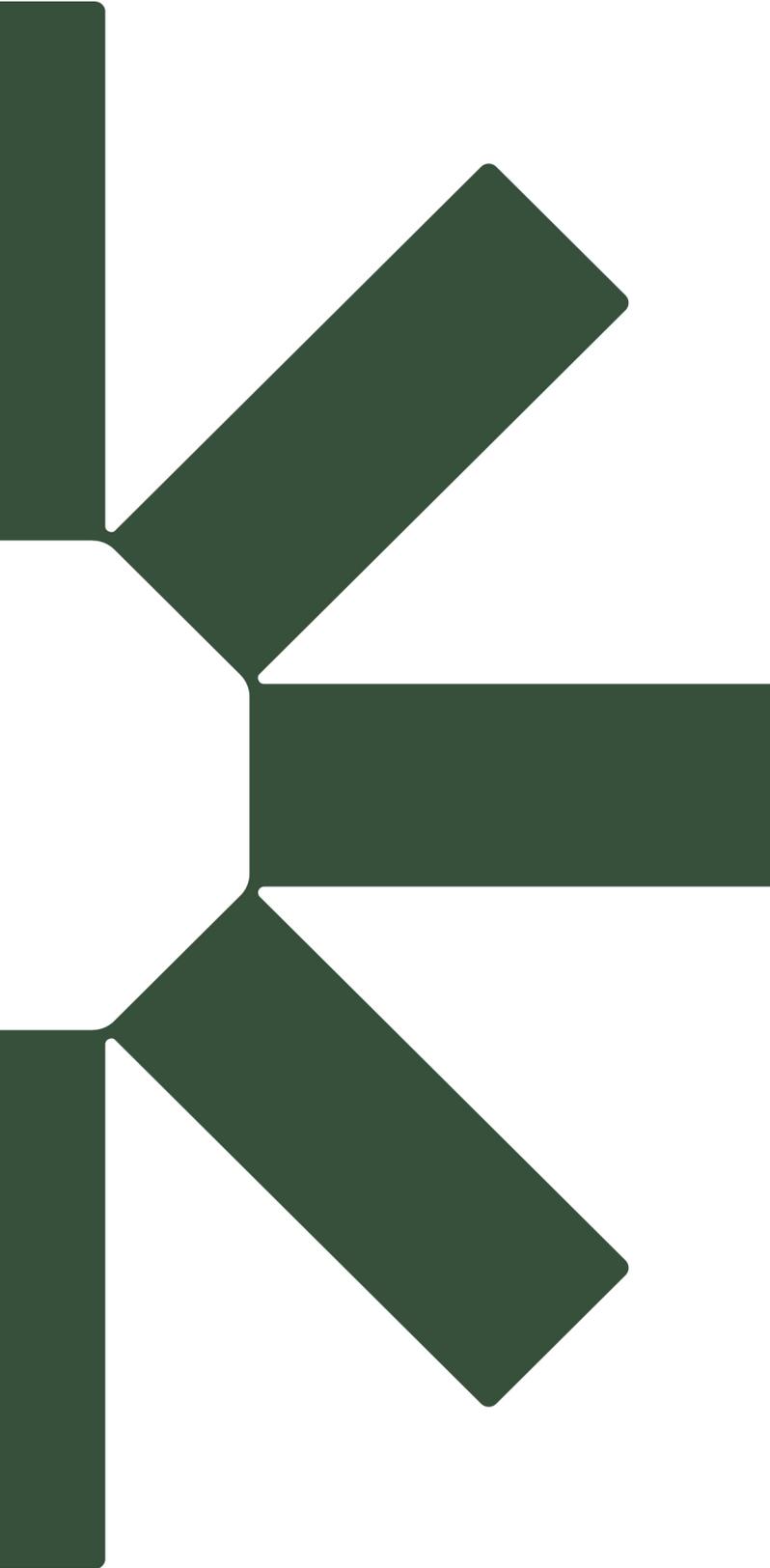
Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

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.



Making Sustainability Happen