

# 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





Unit 7-8 Hawarden Business Park Manor Road (off Manor Lane) Hawarden Deeside CH5 3US

Tel: (01244) 528777

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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** 

ilac-MRA



129



#### **CERTIFICATE OF ANALYSIS**

Validated

Superseded Report:

 SDG:
 220907-99
 Report Number:
 661113

 Client Ref.:
 501.00727.00006
 Location:
 Coolglass, Co. Laois

# **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**

ALS

**SDG**: 220907-99 **Client Ref**.: 501.00727.00006 Report Number: 661113

Results Legend									2
X Test	Lab Sample I	No(s)							26841491
No Determination Possible									
Sample Types -	Custome Sample Refer								BH T2
S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate	AGS Refere	nce							
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage	Depth (m	)							0.00 - 0.00
RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Containe	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	ZnAc (ALE246)				
	Sample Ty	pe	GW	GW	GW	WĐ	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	Х						
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 1	Х						
GRO by GC-FID (W)	All	NDPs: 0 Tests: 1						Х	
Low Level Cyanide (W)	All	NDPs: 0 Tests: 1					X		
Mercury Dissolved	All	NDPs: 0 Tests: 1				Х			
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	Х						
VOC MS (W)	All	NDPs: 0 Tests: 1						X	

#### **CERTIFICATE OF ANALYSIS**

ALS

**SDG**: 220907-99 **Client Ref**.: 501.00727.00006 Report Number: 661113

Companies   Companies   Country Stands   Country Stands
Design (color base)
Companies   Comp
Surphy   Type   Surphy   Typ
Automatical Security Control C
Sample Time   Content of Market   Content of
Delia Prisonale delia
Sob Ref   Lob District Point   Lob District Point
10   10   10   10   10   10   10   10
Method   March   Method   March   Method   March   Method   March
Component   CoPUNITS   Method   TM099   O.055   F   CM099   O.055
Ammonistati Nitrogen as N (low level)
# Ammoniasal Nitogon Low as NH4
Ammoriaala Nitrogen Leva as N94
Sulphole
Suphylade
Subjected   40.01 mg/l   TM101   40.01
Seaminian (des.fili)
Alternic (diss fit)
Alternium (diss filt)
Arsonic (diss.filit)
Average (diss. fit)   <0.5 µg1   TM152   <0.5
Cadmium (diss.filit)
#   Cadmium (diss fitt)   <0.08 µg1   TM152   <0.08 # #
Cadmium (diss filt)
Chromium (diss filt)
Chronium (diss.fit)
Chronium (diss.fit)
Copper (ides filt)   Co.3 μg/l   TM152   Co.3
Copper (diss.filit)
Ceed (diss.filt)
Ceed (diss.filt)
Lead (diss.fill)   <0.2 \( \mu g/l \)   TM152   <0.2 \( \pm \)
Mickel (idiss.filt)
Nickel (diss.filt)
Nickel (diss.filt)
TM152
TM162
#
Find   Filt    Filt
TM152   2.24
# # # # # # # # # # # # # # # # # # #
Mercury (diss.fiit)   <0.01 μg/l   TM183   <0.01 #
# Sulphate
# Sulphate
Sulphate   <2 mg/l   TM184   6.1
# Chloride
Chloride       <2 mg/l
Chloride       <2 mg/l
# Phosphate (Ortho as P)
Phosphate (Ortho as P)       <0.02 mg/l
# Nitrate as NO3
Mitrate as NO3
Nitrate as NO3
# Total Oxidised Nitrogen as N
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 # Cyanide, Total (low level) < 5 μg/l TM279 < 2.5 # Cyanide, Free (low level) < 2.5 μg/l TM279 < 2.5
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 # Cyanide, Total (low level) < 5 μg/l TM279 < 2.5 # Cyanide, Free (low level) < 2.5 μg/l TM279 < 2.5
# PH
PH
# Conductivity @ 20 deg.C
# Conductivity @ 20 deg.C
Conductivity @ 20 deg.C
mS/cm         #           Cyanide, Total (low level)         <5 μg/l
Cyanide, Total (low level) <5 μg/l TM279 <5 #  Cyanide, Free (low level) <2.5 μg/l TM279 <2.5
Cyanide, Total (low level) <5 μg/l TM279 <5 #  Cyanide, Free (low level) <2.5 μg/l TM279 <2.5
# Cyanide, Free (low level)
Cyanide, Free (low level) <2.5 µg/l TM279 <2.5

### **CERTIFICATE OF ANALYSIS**

ALS

TPH CWG (W)

**SDG**: 220907-99 **Client Ref**.: 501.00727.00006 Report Number: 661113

IPH CWG (W)  Results Legend	C	ustomer Sample Ref.	BH T2			
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. totumfilt roal / unifiltered 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 1446@Sample deviation (see appendix)		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Ground Water (GW) 05/09/2022 07/09/2022 220907-99 26841491			
Component	LOD/Units	Method	20			
GRO Surrogate % recovery**	%	TM245	90			
GRO >C5-C12	<50 µg/l	TM245	<50 #			
Aliphatics >C5-C6	<10 µg/l	TM245	<10			
Aliphatics >C6-C8	<10 µg/l	TM245	<10			
Aliphatics >C8-C10	<10 µg/l	TM245	<10			
Aliphatics >C10-C12	<10 µg/l	TM245	<10			
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174	<10			
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174	<10			
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174	<10			
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174	<10			
Aromatics >EC5-EC7	<10 µg/l	TM245	<10			
Aromatics >EC7-EC8	<10 µg/l	TM245	<10			
Aromatics >EC8-EC10	<10 µg/l	TM245	<10			
Aromatics >EC10-EC12	<10 µg/l	TM245	<10			
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174	<10			
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174	<10			
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174	<10			
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174	<10			
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174	<10			
Aliphatics >C16-C35 Aqueous	<10 µg/l	TM174	<10			

## **CERTIFICATE OF ANALYSIS**

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**SDG**: 220907-99 **Client Ref**.: 501.00727.00006 Report Number: 661113

VOC MS (W)	et.: 501.0072			 Jooigiass, Co. Laois		
VOC MS (W)  Results Legend # ISO17025 accredited.	Cı	ustomer Sample Ref.	BH T2			
# ISO17025 accredited.  M mCERTS accredited.  aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.uffilt fold unfiltered sample.  * Subcontracted - refer to subcontractor report for		Depth (m) Sample Type	Ground Water (GW)			
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		Date Sampled Sample Time Date Received SDG Ref	05/09/2022 07/09/2022 220907-99			
recovery (F) Trigger breach confirmed 1-4+§@ Sample deviation (see appendix)  Component	LOD/Units	Lab Sample No.(s) AGS Reference Method				
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1 #			
Benzene	<1 µg/l	TM208	<1 #			
Toluene	<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 #			
Sum of detected Xylenes	<2 µg/l	TM208	<2			
Sum of BTEX	<5 µg/l	TM208	<5			



#### **CERTIFICATE OF ANALYSIS**

 SDG:
 220907-99
 Report Number:
 661113
 Superseded Report:

 Client Ref.:
 501.00727.00006
 Location:
 Coolglass, Co. Laois

# **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).

Validated

#### **CERTIFICATE OF ANALYSIS**

ALS

**SDG**: 220907-99 **Client Ref**.: 501.00727.00006 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
Туре	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

#### **CERTIFICATE OF ANALYSIS**



Appendix

SDG: 22 Client Ref: 50

220907-99 501.00727.00006 Report Number: 661113 Location: Coolglass, Co. Laois

# General

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 sylenes (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.

Superseded Report:

#### 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.

Asbe stos Type	Common Name
Chrysof le	WhiteAsbesbs
Amosite	Brown Asbestos
Cro a dolite	Blue Asbe stos
Fibrous Act nolite	-
Fib to us Anthop hyll ite	-
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  $<3 \mu m$  diameter, longer than 5  $\mu m$  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** 





1291

Validated

## **CERTIFICATE OF ANALYSIS**

ALS

**SDG:** 230320-84 **Client Ref.:** 501.00727.00006

Report Number: 684192 Location: Coolglass, Co. Laois

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**

ALS

**SDG**: 230320-84 **Client Ref**.: 501.00727.00006 Report Number: 684192

Location: Coolglass, Co. Laois

Results Legend 27709116 27709124 27709132 27709140 Lab Sample No(s) X Test No Determination Possible Customer Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water 0.00 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 SA - Saline Water Depth (m) TE - Trade Effluent - 0.00 TS - Treated Sewage US - Untreated Sewage 250ml BOD (ALE212) 250ml Amber Gl. PTFE/PE (ALE219) 250ml BOD (ALE212) 250ml Amber Gl. PTFE/PE (ALE219) 250ml BOD (ALE212) 250ml Amber Gl. PTFE/PE (ALE219) RE - Recreational Water 250ml Amber Gl. PTFE/PE (ALE219) H2SO4 (ALE244) H2SO4 (ALE244) H2SO4 (ALE244) H2SO4 (ALE244) 500ml Plastic (ALE208) 250ml BOD (ALE212) DW - Drinking Water Non-regulatory 500ml Plastic (ALE208) 500ml Plastic (ALE208) Vial (ALE297) Vial (ALE297) Vial (ALE297) 500ml Plastic (ALE208) UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other Sample Type WS Ammoniacal Nitrogen All NDPs: 0 Tests: 17 Χ Χ Х Х Anions by Kone (w) All NDPs: 0 Tests: 17 Х Χ Х Х BOD True Total All NDPs: 0 Tests: 17 Χ X X X COD Unfiltered All NDPs: 0 Tests: 17 Х X Χ Х EPH (DRO) (C10-C40) Aqueous (W) All NDPs: 0 Tests: 17 X X X Х GRO by GC-FID (W) All NDPs: 0 Tests: 17 X X X pH Value All NDPs: 0 Tests: 17 X X X X Phosphate by Kone (w) All NDPs: 0 Tests: 17 Χ Χ Χ Х Suspended Solids All NDPs: 0 Tests: 17 Χ X Χ Χ Total EPH (aq) All NDPs: 0 Tests: 17 X X X X Total Metals by ICP-MS All NDPs: 0 Tests: 17 Х X Χ Х Total Organic and Inorganic Carbon All NDPs: 0 Tests: 17 Х X Х Х Turbidity in waters All NDPs: 0 Tests: 17 Х Х X Х VOC MS (W) All NDPs: 0 Tests: 17 X X X

27709140					27709148						27709156					27709164					27709172
4					ហ						თ					7					8
0.00 - 0.00					0.00 - 0.00						0.00 - 0.00					0.00 - 0.00					0.00 - 0.00
Vial (ALE297)	250ml Amber Gl. PTFE/PE (ALE219)	250ml BOD (ALE212)	(ALE208)	H2SO4 (ALE244)	Vial (ALE297)	PTFE/PE (ALE219)	250ml Amher Gl	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	Vial (ALE297)	250ml Amber GI. PTFE/PE (ALE219)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	Vial (ALE297)	250ml Amber Gl. PTFE/PE (ALE219)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	Vial (ALE297)
WS	WS	WS	SW	WS	WS	(	S N	WS	WS	WS	WS	WS	WS	WS	WS	WS	WS	WS	WS	WS	WS
x	x	X	x x x	X	x	x		X	x x x	X	x	x	X	x x x	X	x	x	X	x x x x	X	x
X			X		X				X		X			X		X			Х		X

### **CERTIFICATE OF ANALYSIS**

ALS

**SDG:** 230320-84 **Client Ref.:** 501.00727.00006

Report Number: 684192

X Test No Determination Possible	Lab Sample N					27709180					27709189					27709198				27709206	
Sample Types -		Customer Sample Reference					ဖ					10					⇉				12
S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate	AGS Referen	ıce																			
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage	Depth (m)						0.00 - 0.00					0.00 - 0.00					0.00 - 0.00				0.00 - 0.00
RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Container		250ml Amber Gl. PTFE/PE (ALE219)	250ml BOD (ALE212)	(ALE208)	H2SO4 (ALE244)	Vial (ALE297)	250ml Amber Gl. PTFE/PE (ALE219)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	Vial (ALE297)	250ml Amber Gl. PTFE/PE (ALE219)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	Vial (ALE297)	250ml Amber Gl. PTFE/PE (ALE219)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)
	Sample Typ	е	WS	WS	S	WS	WS	WS			WS	WS	WS	WS	WS	WS	WS	WS	WS	WS	WS
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 17				Х					Х					Х					Х
Anions by Kone (w)	All	NDPs: 0 Tests: 17			Х					X					X					Х	
BOD True Total	All	NDPs: 0 Tests: 17		Х					Х					X					Х		
COD Unfiltered	All	NDPs: 0 Tests: 17			Х					Х					Х					Х	
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 17	Х					X					X					X			
GRO by GC-FID (W)	All	NDPs: 0 Tests: 17					X					X					Х				
pH Value	All	NDPs: 0 Tests: 17			Х					X					X					Х	
Phosphate by Kone (w)	All	NDPs: 0 Tests: 17			Х					Х					X					Х	
Suspended Solids	All	NDPs: 0 Tests: 17			Х					Х					X					Х	
Total EPH (aq)	All	NDPs: 0 Tests: 17	Х					X					Х					X			
Total Metals by ICP-MS	All	NDPs: 0 Tests: 17			Х					X					X					Х	
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 17				Х					Х					X					Х
Turbidity in waters	All	NDPs: 0 Tests: 17			X					X					X					X	
VOC MS (W)	All	NDPs: 0 Tests: 17					Х					Х					Х				

27709206					27709214					27709222					27709230					27709239
12					13					14					15					16
0.00 - 0.00					0.00 - 0.00					0.00 - 0.00					0.00 - 0.00					0.00 - 0.00
Vial (ALE297)	250ml Amber Gl. PTFE/PE (ALE219)	(ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	Vial (ALE297)	250ml Amber Gl. PTFE/PE (ALE219)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	Vial (ALE297)	250ml Amber Gl. PTFE/PE (ALE219)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	Vial (ALE297)	250ml Amber Gl. PTFE/PE (ALE219)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	Vial (ALE297)
WS		V: W	SW	WS	WS	SW	WS	WS	WS	WS	WS	WS	WS	WS	WS	SW	WS	WS	WS	WS
X	X	X	X X X	X	X	X	X	x x x x x	X	X	X	X	X X X X	X	X	X	X	X X X X	X	X
X	X		x	X	X	X		X	X	X	X		X	X	X	X		X	X	x

Validated

Superseded Report:

#### **CERTIFICATE OF ANALYSIS**

ALS

**SDG:** 230320-84 **Client Ref.:** 501.00727.00006

Report Number: 684192

Results Legend  X Test  No Determination Possible  Customer Sample Reference  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 TS - Treated Effluent TS - Treated Sewage US - Untreated Sew
Customer Sample Reference  Sample Reference  Sample Reference  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
Sample Reference  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
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
PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage
G - Gas OTH - Other  OTH - Other
Sample Type $\begin{array}{c ccccccccccccccccccccccccccccccccccc$
Ammoniacal Nitrogen All NDPs: 0 Tests: 17
Anions by Kone (w)  All  NDPs: 0 Tests: 17
BOD True Total All NDPs: 0 Tests: 17
COD Unfiltered All NDPs: 0 Tests: 17
EPH (DRO) (C10-C40) Aqueous (W)  All  NDPs: 0  Tests: 17
GRO by GC-FID (W)  All  NDPs: 0  Tests: 17
pH Value All NDPs: 0 Tests: 17
Phosphate by Kone (w)  All  NDPs: 0 Tests: 17
Suspended Solids  All  NDPs: 0 Tests: 17  X
Total EPH (aq)  All  NDPs: 0  Tests: 17
Total Metals by ICP-MS  All  NDPs: 0 Tests: 17
Total Organic and Inorganic Carbon  All  NDPs: 0 Tests: 17
Turbidity in waters All NDPs: 0 Tests: 17 X
VOC MS (W)  All  NDPs: 0  Tests: 17

### **CERTIFICATE OF ANALYSIS**



**SDG**: 230320-84 **Client Ref**.: 501.00727.00006

Report Number: 684192

Results Legend # ISO17025 accredited.		Customer Sample Ref.	1	2	3	4	5	6	
M mCERTS accredited.									
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	
tot.unfilt Total / unfiltered sample.  * Subcontracted - refer to subcontractor report for		Sample Type	Surface Water (SW)						
accreditation status.		Date Sampled	15/03/2023	15/03/2023	15/03/2023	15/03/2023	15/03/2023	15/03/2023	
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual		Sample Time Date Received	20/03/2023	20/03/2023	20/03/2023	20/03/2023	20/03/2023	20/03/2023	
compounds within samples aren't corrected for the		SDG Ref	230320-84	230320-84	230320-84	230320-84	230320-84	230320-84	
recovery (F) Trigger breach confirmed		Lab Sample No.(s)	27709116	27709124	27709132	27709140	27709148	27709156	
1-4+§@ Sample deviation (see appendix)		AGS Reference							
Component	LOD/Units								
Suspended solids, Total	<2 mg/l	TM022	4.5	<2	2.85	6.65	4.75	4.05	
			#	#	#	#	#	#	
BOD, unfiltered	<1 mg/l	TM045	<1	<1	<1	<1	<1	<1	
			@#	@#	@#	@#	@#	@#	
Organic Carbon, Total	<3 mg/l	TM090	8.67	7.96	8.65	5.18	9.92	8.64	
	ŭ		#	#	#	#	#	#	
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
1 11 11 11 11	0.2g/.		#	#	#	#	#	#	
COD, unfiltered	<7 mg/l	TM107	25	22.2	25.5	19.9	45.9	29.6	
COD, utilillered	mg/i</td <td>1101107</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	1101107							
71 1 6 1 70			#	#	#	#	#	#	
Phosphorus (tot.unfilt)	<20 µg/l	TM152	<20	47.5	51.1	55.8	157	48.4	
			2#	2#	2#	2#	2#	2#	
EPH Range >C10 - C40 (aq)	<100 µg/l	TM172	<100	<100	<100	<100	<100	<100	
			#	#	#	#	#	#	
Total EPH (C6-C40) (aq)	<100 µg/l	TM172	<100	<100	<100	<100	<100	<100	
		1							
Phosphate (Ortho as P)	<0.02 mg/l	TM184	<0.02	<0.02	<0.02	<0.02	0.0574	<0.02	
sopriato (stato as i )	~0.02 IIIg/I	1 IVI 104				<0.02 #	0.0574 #		
Nitrata as NO2	,00 ···	T14404	7.02	4	#			#	
Nitrate as NO3	<0.3 mg/l	TM184	7.03	6.55	5.1	5.68	6.84	5.3	
		1	#	#	#	#	#	#	
Turbidity	<0.1 ntu	TM195	5.27	3.62	3.99	4.63	5.01	5.13	
			@#	@#	@#	@#	@#	@#	
pH	<1 pH Units	TM256	7.31	8	8.09	7.79	7.93	7.85	
ľ	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		#	#	#	#	#	#	
Conductivity @ 20 deg.C	<0.02	TM256	0.088	0.251	0.218	0.173	0.232	0.192	
Conductivity @ 20 deg.o	l	TIVIZO							
	mS/cm		#	#	#	#	#	#	
		+							
		1							
		1						7	
		1						7	
		1						7	
		1							

#### **CERTIFICATE OF ANALYSIS**

ALS

**SDG**: 230320-84 **Client Ref**.: 501.00727.00006 Report Number: 684192

Location: Coolglass, Co. Laois

Results Legend

# ISO17025 accredited.

M mCERTS accredited.
aq Aqueous / settled sample.
diss.fill Dissolved/ filtered sample.
tot.unfill 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 Customer Sample Re 8 10 11 12 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 Sam 15/03/2023 15/03/2023 15/03/2023 15/03/2023 15/03/2023 15/03/2023 Sample Time 20/03/2023 20/03/2023 20/03/2023 20/03/2023 20/03/2023 20/03/2023 Date Receive SDG Re 230320-84 230320-84 230320-84 230320-84 230320-84 230320-84 27709164 27709172 27709180 27709189 27709198 27709206 Lab Sample No.(s) AGS Reference LOD/Units Component Method Suspended solids, Total 5.6 5 5.4 6.75 3.65 7.8 TM022 <2 mg/l # # # # BOD, unfiltered TM045 <1 mg/l <1 <1 <1 <1 <1 <1 # # # # # Organic Carbon, Total 7.46 TM090 11.1 6.39 6.33 6.87 6.39 <3 mg/l # Ammoniacal Nitrogen as N <0.2 mg/l TM099 < 0.2 < 0.2 < 0.2 < 0.2 < 0.2 < 0.2 COD, unfiltered <7 mg/l TM107 18.9 22.7 15.5 23.6 32.9 19.9 Phosphorus (tot.unfilt) <20 µg/l TM152 24.3 81.1 49.3 97 59.5 <20 2# 2# 2# 2# 2# 2# EPH Range >C10 - C40 (aq) <100 µg/l TM172 <100 <100 <100 103 <100 <100 # # # # Total EPH (C6-C40) (aq) <100 µg/l TM172 <100 <100 <100 103 <100 <100 Phosphate (Ortho as P) TM184 <0.02 0.0307 0.0238 0.045 0.0225 <0.02 <0.02 mg/l # Nitrate as NO3 <0.3 mg/l TM184 2.96 5.53 8.88 15.9 5.3 3.53 # # # # Turbidity <0.1 ntu TM195 4.62 4.22 3.72 4.64 4.59 5.05 @# @# @# @# @# @# <1 pH Units TM256 7.7 7.84 7.75 7.25 8.16 8.24 # 0.0858 Conductivity @ 20 deg.C < 0.02 TM256 0.109 0.16 0.345 0.435 0.157 mS/cm #

### **CERTIFICATE OF ANALYSIS**



**SDG**: 230320-84 **Client Ref**.: 501.00727.00006

Report Number: 684192

Results Legend # ISO17025 accredited.		Customer Sample Ref.	13	14	15	16	17	
M mCERTS accredited. aq Aqueous / settled sample.								
diss.filt Dissolved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	
tot.unfilt Total / unfiltered sample.  * Subcontracted - refer to subcontractor report for		Sample Type	Surface Water (SW)					
accreditation status.  ** % recovery of the surrogate standard to check the		Date Sampled Sample Time	16/03/2023	16/03/2023	16/03/2023	16/03/2023	16/03/2023	
efficiency of the method. The results of individual compounds within samples aren't corrected for the		Date Received	20/03/2023	20/03/2023	20/03/2023	20/03/2023	20/03/2023	
recovery		SDG Ref	230320-84 27709214	230320-84 27709222	230320-84 27709230	230320-84 27709239	230320-84 27709249	
(F) Trigger breach confirmed 1-4+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	21103214	21103222	21103230	21103203	21103243	
Component	LOD/Units							
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	I 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 Unit	s TM256	7.39	7.29	7.52	7.54	7.54	
			#	#	#	#	#	
Conductivity @ 20 deg.C	<0.02	TM256	0.0587	0.122	0.12	0.118	0.119	
	mS/cm	200	#	#	#	#	#	
			"		"	,,		
		+						
		+						
		+						
		+ -						
		+						
		+ -						
		+ -						
		+						
		+						

#### **CERTIFICATE OF ANALYSIS**

ALS

**SDG:** 230320-84 **Client Ref.:** 501.00727.00006

Report Number: 684192

Location: Coolglass, Co. Laois

GRO by GC-FID (W) Rosults Lagand

# ISO17025 accredited.

# ISO17025 accredited.

aq Aqueous / settled 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

1-4-5@ Sample deviation (see appendix) Customer Sample Ref 2 4 5 6 Depth (m) 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 Surface Water (SW) 15/03/2023 Sample Type Date Sampled Surface Water (SW) 15/03/2023 15/03/2023 15/03/2023 15/03/2023 15/03/2023 Sample Time Date Received 20/03/2023 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 230320-84 27709116 27709124 27709132 27709140 27709148 27709156 Lab Sample No.(s) AGS Reference Component LOD/Units Method GRO >C5-C10 TM245 <10 <10 <10 <10 <10 <10 <10 µg/l 1 <100 µg/l EPH (C6-C10) TM245 <100 <100 <100 <100 <100 <100 1

#### **CERTIFICATE OF ANALYSIS**

ALS

**SDG:** 230320-84 **Client Ref.:** 501.00727.00006

Report Number: 684192

Location: Coolglass, Co. Laois

GRO by GC-FID (W) Rosults Lagand

# ISO17025 accredited.

# ISO17025 accredited.

aq Aqueous / settled 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

1-4-5@ Sample deviation (see appendix) Customer Sample Ref 10 11 12 8 Depth (m) 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 Surface Water (SW) 15/03/2023 Sample Type Date Sampled Surface Water (SW) 15/03/2023 15/03/2023 15/03/2023 15/03/2023 15/03/2023 Sample Time Date Received 20/03/2023 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 230320-84 27709164 27709172 27709180 27709189 27709198 27709206 Lab Sample No.(s) AGS Reference Component LOD/Units Method GRO >C5-C10 TM245 <10 <10 <10 <10 <10 <10 <10 µg/l 3 <100 µg/l EPH (C6-C10) TM245 <100 <100 <100 <100 <100 <100 3

#### **CERTIFICATE OF ANALYSIS**

ALS

**SDG**: 230320-84 **Client Ref**.: 501.00727.00006 Report Number: 684192

Location: Coolglass, Co. Laois

GRO by GC-FID (W) Rosults Lagand

# ISO17025 accredited.

# ISO17025 accredited.

aq Aqueous / settled 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

1-4-5@ Sample deviation (see appendix) Customer Sample Ref 13 14 15 16 17 Depth (m) 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 0.00 - 0.00 Sample Type Date Sampled Surface Water (SW) Surface Water (SW) 16/03/2023 Surface Water (SW) Surface Water (SW) Surface Water (SW) 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 27709214 27709222 27709230 27709239 27709249 Lab Sample No.(s) AGS Reference Component LOD/Units Method GRO >C5-C10 TM245 <10 <10 <10 <10 <10 <10 µg/l 3 3 EPH (C6-C10) <100 µg/l TM245 <100 <100 <100 <100 <100 3 3

### **CERTIFICATE OF ANALYSIS**

ALS	230320-84 501.00727.00006	Report Number: Location:	 Superseded Report:
VOC MS (W)			

Results Legend		Customer Sample Ref.	4	2	2				
# ISO17025 accredited.  M mCERTS accredited.  aq Aqueous / settled sample.  diss.RR Dissolved / filtered sample.  Class of the sample.  Subcontracted - refer to subcontractor report for accreditation status.  " k 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		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref	0.00 - 0.00 Surface Water (SW) 15/03/2023 20/03/2023 230320-84	2 0.00 - 0.00 Surface Water (SW) 15/03/2023  20/03/2023 230320-84	3 0.00 - 0.00 Surface Water (SW) 15/03/2023 20/02/2023 230320-84	4 0.00 - 0.00 Surface Water (SW) 15/03/2023 20/03/2023 230320-84	5 0.00 - 0.00 Surface Water (SW) 15/03/2023 20/03/2023 230320-84	6 0.00 - 0.00 Surface Water (SW) 15/03/2023 - 20/3/2023 230320-84	
(F) Trigger breach confirmed		Lab Sample No.(s)	27709116	27709124	27709132	27709140	27709148	27709156	
1-4+§@ Sample deviation (see appendix)	1000	AGS Reference							
Component  Methyl tertiary butyl ether (MTBE)	LOD/Units <1 µg/l	Method TM208	<1	<1	<1	<1	<1	<1	
			#	#		#	#	#	
Benzene	<1 µg/l	TM208	<1 #	<1 #	<1 1#	<1 #	<1 #	<1 #	
Toluene	<1 µg/l	TM208	<1 #	<1 #	<1 1#	<1 #	<1 #	<1 #	
Ethylbenzene	<1 µg/l	TM208	<1 #	<1 #	<1 1#	<1 #	<1 #	<1 #	
m,p-Xylene	<1 µg/l	TM208	<1 #	<1 #	<1 1#	<1 #	<1 #	<1 #	
o-Xylene	<1 µg/l	TM208	<1 #	<1 #	<1 1#	<1 #	<1 #	<1 #	
Sum of BTEX	<5 µg/l	TM208	<5	<5	<5 1	<5	<5	<5	

### **CERTIFICATE OF ANALYSIS**

ALS

**SDG:** 230320-84 **Client Ref.:** 501.00727.00006

Report Number: 684192

Client Ref.: 501.00727.00000 Euclation: Coolglass, Co. Labis								
VOC MS (W)  Results Legend		Customer Sample Ref.	7	8	9	10	11	12
M mCERTS accredited.	]	•						-
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
tot.unfilt Total / unfiltered sample.  * Subcontracted - refer to subcontractor report for accreditation status.		Sample Type Date Sampled	Surface Water (SW) 15/03/2023					
** % recovery of the surrogate standard to check the		Sample Time						
efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	,	Date Received SDG Ref	20/03/2023 230320-84	20/03/2023 230320-84	20/03/2023 230320-84	20/03/2023 230320-84	20/03/2023 230320-84	20/03/2023 230320-84
(F) Trigger breach confirmed 1-4+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	27709164	27709172	27709180	27709189	27709198	27709206
Component	LOD/Units	Method						
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
Benzene	<1 µg/l	TM208	# <1	# <1	# <1	# <1	# <1	# <1
Bonzono	~1 μg/1	TIVIZUO	#	*	-1 #	*	*	- "
Toluene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
			#	#	#	#	#	#
Ethylbenzene	<1 µg/l	TM208	<1	<1	<1	<1 #	<1	<1
m,p-Xylene	<1 µg/l	TM208	# <1	# <1	# <1	<1	# <1	<u></u>
* 7	. 149.	200	. #	. #	. #	. #	. #	. #
o-Xylene	<1 µg/l	TM208	<1	<1	<1	<1	<1	<1
O (PTEV	- "	=	#	- #	#	- #	- #	#
Sum of BTEX	<5 µg/l	TM208	<5	<5	<5	<5	<5	<5

### **CERTIFICATE OF ANALYSIS**

ALS

**SDG**: 230320-84 **Client Ref**.: 501.00727.00006

Report Number: 684192

VOC MS (W)	MS (W)
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VOC MS (W)  Results Legend									
# ISO1/025 accredited.		Customer Sample Ref.	13	14	15		16	17	
M mCERTS accredited. aq Aqueous / settled sample.								,	
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.00 - 0.00 Surface Water (SW)	0.00 - 0.00 Surface Water (SW)	0.00 - 0.00 Surface Water (S'	SW)	0.00 - 0.00 Surface Water (SW)	0.00 - 0.00 Surface Water (SW)	
<ul> <li>Subcontracted - refer to subcontractor report for accreditation status.</li> </ul>		Date Sampled	16/03/2023	16/03/2023	16/03/2023	,,,	16/03/2023	16/03/2023	
** % recovery of the surrogate standard to check the		Sample Time							
efficiency of the method. The results of individual compounds within samples aren't corrected for the		Date Received SDG Ref	20/03/2023 230320-84	20/03/2023 230320-84	20/03/2023 230320-84		20/03/2023 230320-84	20/03/2023 230320-84	
recovery (F) Trigger breach confirmed		Lab Sample No.(s)	27709214	27709222	27709230		27709239	27709249	
1-4+§@ Sample deviation (see appendix)	1.00///	AGS Reference							
Component Methyl tertiary butyl ether (MTBE)	<b>LOD/U</b> <1 μ		<1	<1	<1		<1	<1	
mount toracity butyl carol (MTBE)	ν, μ	9/1 1101200	#	#		#	3#	#	
Benzene	<1 µ	g/l TM208	<1	<1	<1		<1	<1	
	, μ	9/1 110/200	#	#		#	3#	#	
Toluene	<1 µ	g/l TM208	<1	<1	<1		<1	<1	
	1 P;	9/1 1111200	#			#	3#	#	
Ethylbenzene	<1 µ	g/l TM208	<1	<1	<1		<1	<1	
Ť			#	#		#	3#	#	
m,p-Xylene	<1 µ	g/l TM208	<1	<1	<1		<1	<1	
			#	#	<u>:</u>	#	3#	#	
o-Xylene	<1 µ	g/l TM208	<1	<1	<1		<1	<1	
			#	#	<u> </u>	#	3#	#	
Sum of BTEX	<5 µ	g/l TM208	<5	<5	<5		<5	<5	
							3		
					1				
					1				
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Validated

ALS

 SDG:
 230320-84
 Report Number:
 684192

 Client Ref.:
 501.00727.00006
 Location:
 Coolglass, Co. Laois

Superseded Report:

# **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.

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

16:18:22 30/03/2023

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#### **CERTIFICATE OF ANALYSIS**

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**SDG:** 230320-84 **Client Ref.:** 501.00727.00006

Report Number: 684192

Location: Coolglass, Co. Laois

Superseded Report:

# **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
Туре	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									
	07700400	07700000	07700044	07700000	07700000	07700000	07700040	1		

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
Туре	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

#### **CERTIFICATE OF ANALYSIS**

General



**SDG:** 230320-84 **Client Ref:** 501.00727.00006

Report Number: 684192

Location: Coolglass, Co. Laois

# **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.

# 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.

Superseded Report:

#### 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.

Asbe stos Type	Common Name
Chrysof le	White Asbesbs
Amosite	BrownAsbestos
Cro a dolite	Blue Asbe stos
Fibrous Act nolite	-
Fib to us Anthop hyll ite	-
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  $\mu$ m diameter, longer than 5  $\mu$ m 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.

