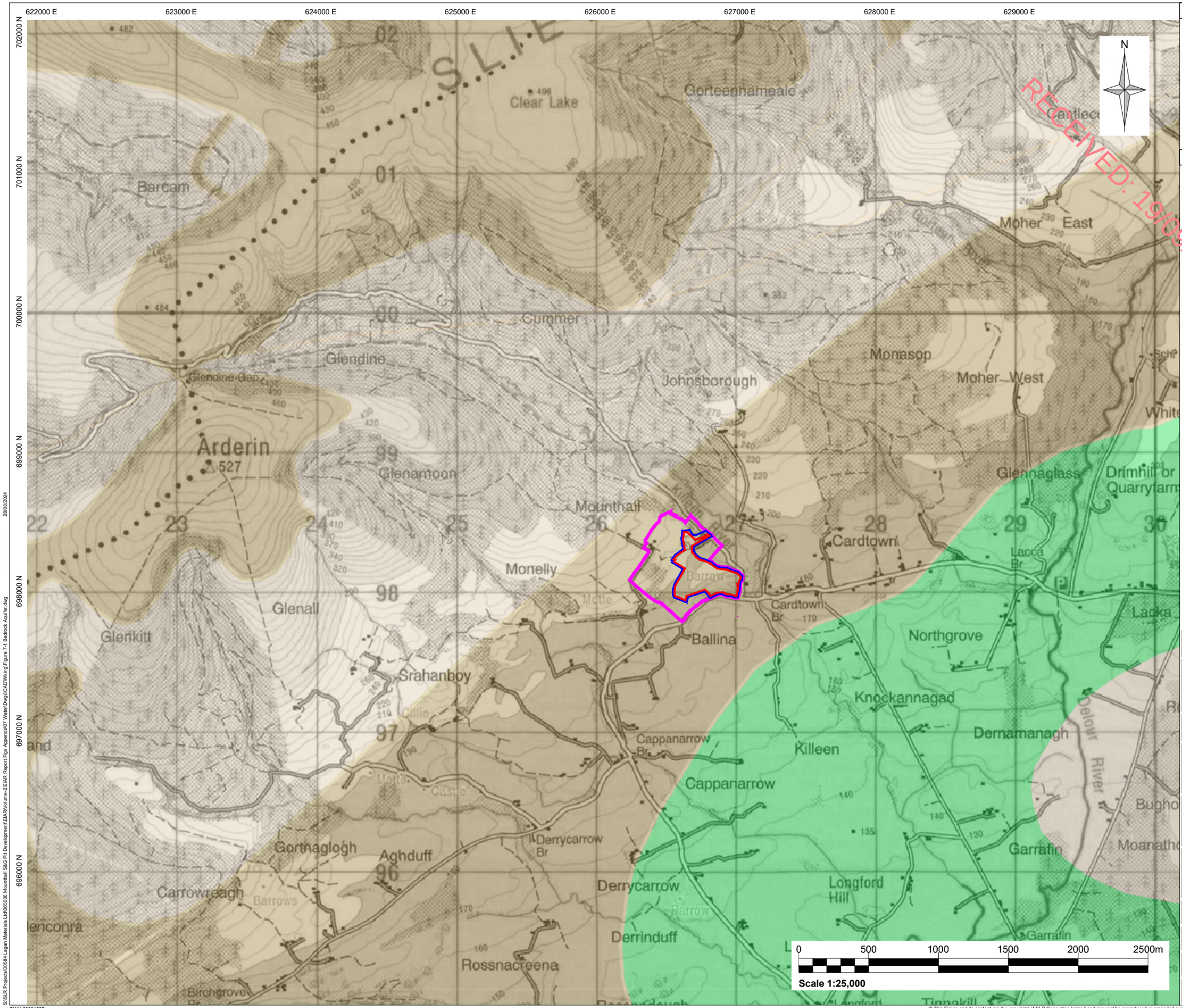

RECEIVED: 19/09/2024

Notes:

1. Extract from Ordnance Survey Discovery Series Map No. 54
2. Extract from GSI Bedrock Aquifer © GSI

Legend:

- Landowner Boundary (c.32.1 Hectares)
  Third party landowner's land interest
- Planning Application Area (c.12.2 Hectares)
- Applicants Land Interest Area (c.12.4 Hectares)
  under lease agreement from landowner
- LI - Locally important aquifer - bedrock which is moderately productive only in local zones
- PI - Poor aquifer - bedrock which is generally unproductive except for local zones
- Rf - Regionally important aquifer - fissured bedrock

Rev	Amendments	Date	By	Chk	Auth

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Client
Breedon Ireland

Project
Sand and Gravel Pit Extension Development, Mounthall, Camross, Co. Laois

Figure Title
Bedrock Aquifer Map

Scale		SLR Project No.	
1:25,000	@ A3	501.00584.065036	
Designed	Drawn	Checked	Authorised
NB	NB	DB	DB
Date	Date	Date	Date
03/24	03/24	09/24	09/24

Figure Number
Figure 7-1

Rev.
R0

S:\SLR Projects\00584 Lagan Materials Ltd\065036 Mounthall S&G Pit Development\EIAR\Volume-2 EIAR Report Figs Appends\07 Water\Dwgs\CAD\Working\Figure 7-1 Bedrock Aquifer.dwg 28/08/2024

CYAL50381397
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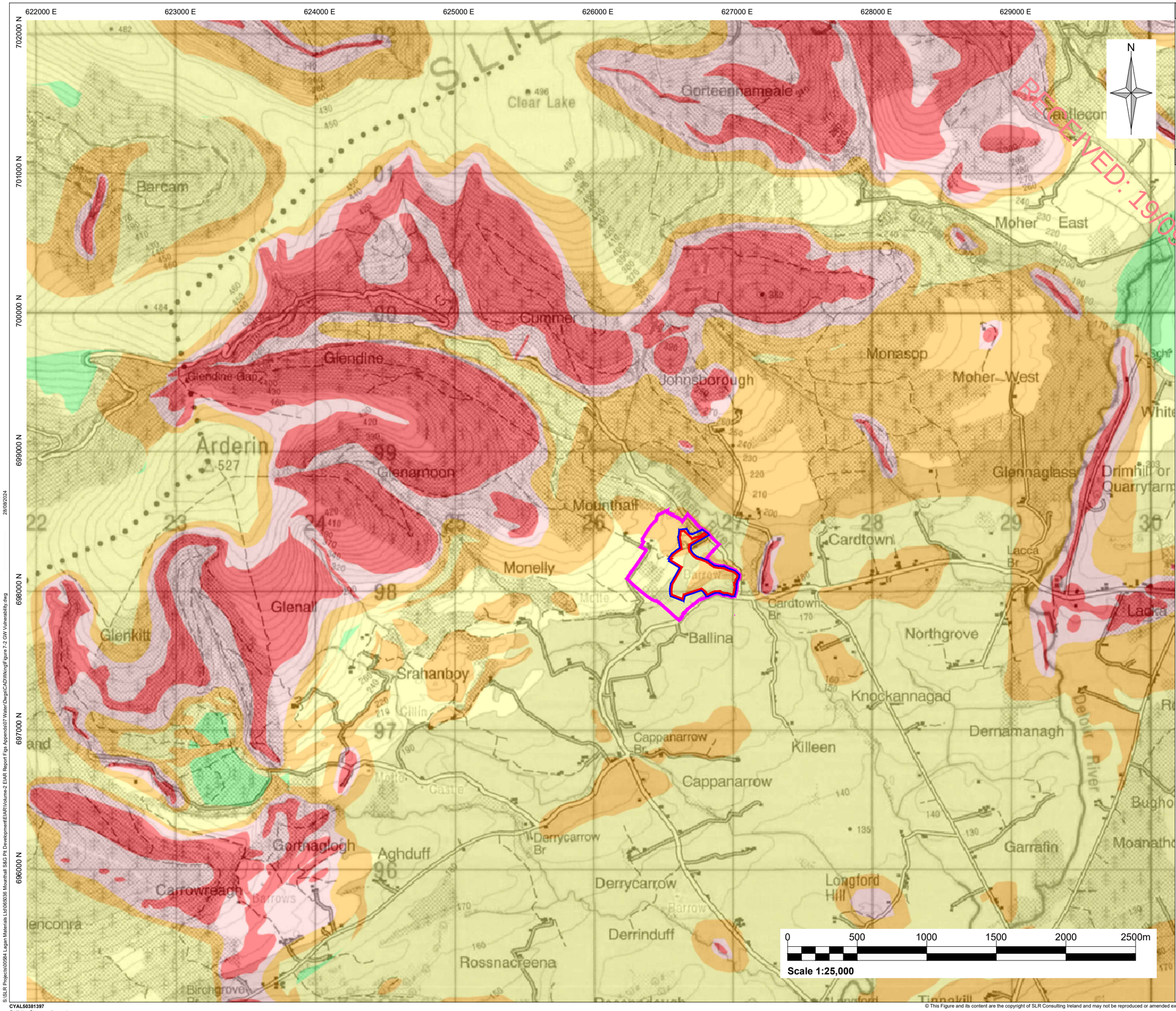

RECEIVED: 19/09/2024

Notes:

1. Extract from Ordnance Survey Discovery Series Map No. 54
2. Extract from GSI Groundwater Vulnerability © GSI

Legend:

- Landowner Boundary (c.32.1 Hectares)
  Third party landowner's land interest
- Planning Application Area (c.12.4 Hectares)
- Applicants Land Interest Area (c.12.4 Hectares)
  under lease agreement from landowner
- Rock at or near surface or karst
- Extreme vulnerability
- High vulnerability
- Moderate vulnerability
- Low vulnerability

Rev	Amendments	Date	By	Chk	Auth

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Client
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Project
Sand and Gravel Pit Extension Development, Mounthall, Camross, Co. Laois

Figure Title
Groundwater Vulnerability Map

Scale		SLR Project No.	
1:25,000	@ A3	501.00584.065036	
Designed	Drawn	Checked	Authorised
NB	NB	DB	DB
Date	Date	Date	Date
03/24	03/24	09/24	09/24

Figure Number
Figure 7-2

Rev.
R0

S:\SLR Projects\00584 Lagan Materials Ltd\065036 Mounthall S&G Pit Development\EIAR\Volume-2 EIAR Report Figs Appends\07 Water\Dwgs\CAD\Wking\Figure 7-2 GW Vulnerability.dwg 28/08/2024

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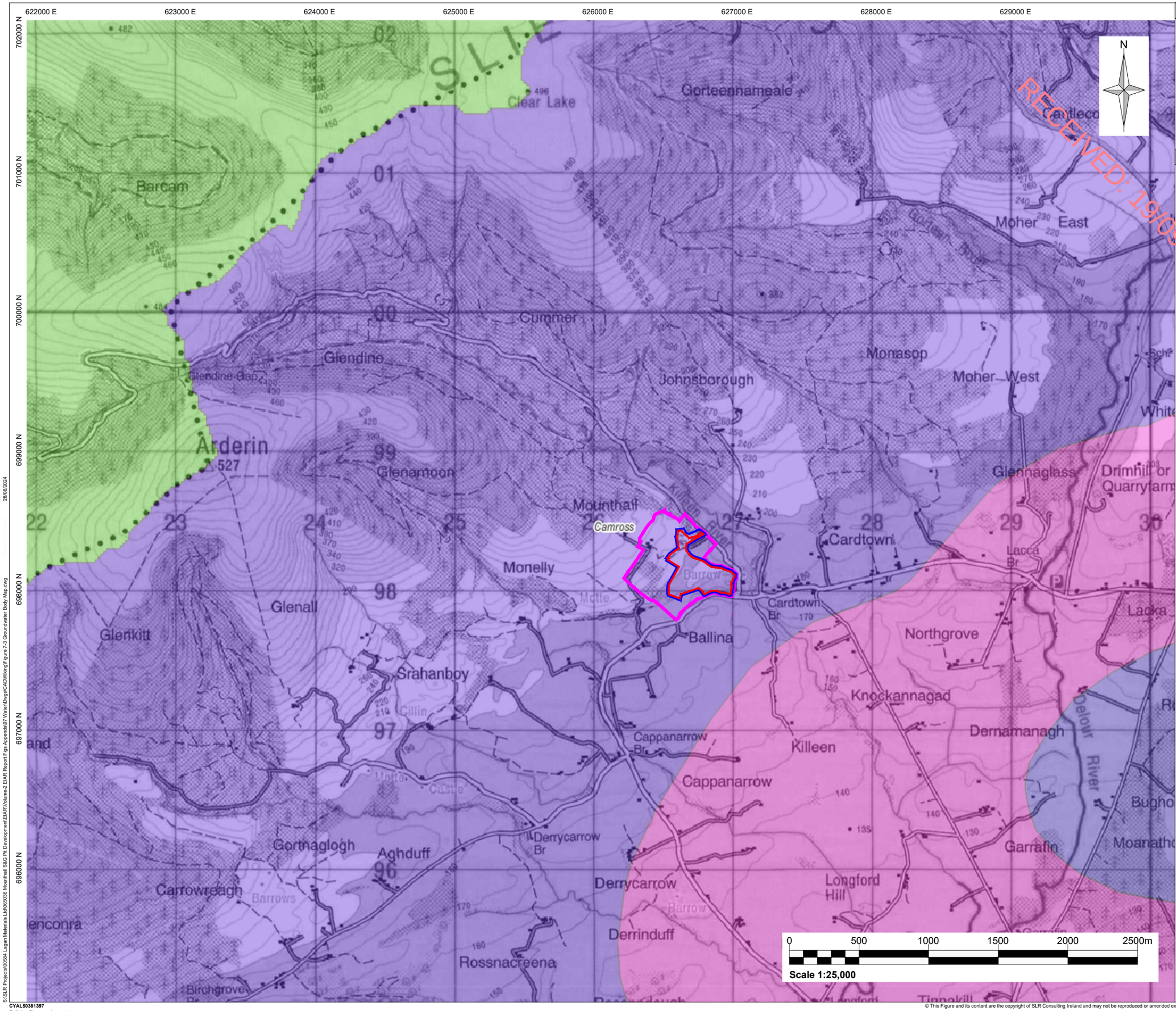

RECEIVED: 19/09/2024

Notes:

1. Extract from Ordnance Survey Discovery Series Map No. 54
2. Extract from EPA Groundwater Body © EPA

Legend:

- Landowner Boundary (c.32.1 Hectares)
  Third party landowner's land interest
- Planning Application Area (c.12.2 Hectares)
- Applicants Land Interest Area (c.12.4 Hectares)
  Under lease agreement from landowner
- Camross
- Slieve Bloom South
- Coolrain

Rev	Amendments	Date	By	Chk	Auth

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Project
Sand and Gravel Pit Extension Development, Mounthall, Camross, Co. Laois

Figure Title
Groundwater Body Map

Scale	SLR Project No.
1:25,000 @ A3	501.00584.065036

Designed	Drawn	Checked	Authorised
NB	NB	DB	DB
Date 03/24	Date 09/24	Date 09/24	Date 09/24

Figure Number **Figure 7-3**

Rev. **R0**

S:\SLR Projects\00584 Lagan Materials Ltd\065036 Mounthall S&G Pit Development\EIAR\Volume-2 EIAR Report Figs Appendics\07 Water\Dwgs\CAD\Wking\Figure 7-3 Groundwater Body Map.dwg 28/08/2024

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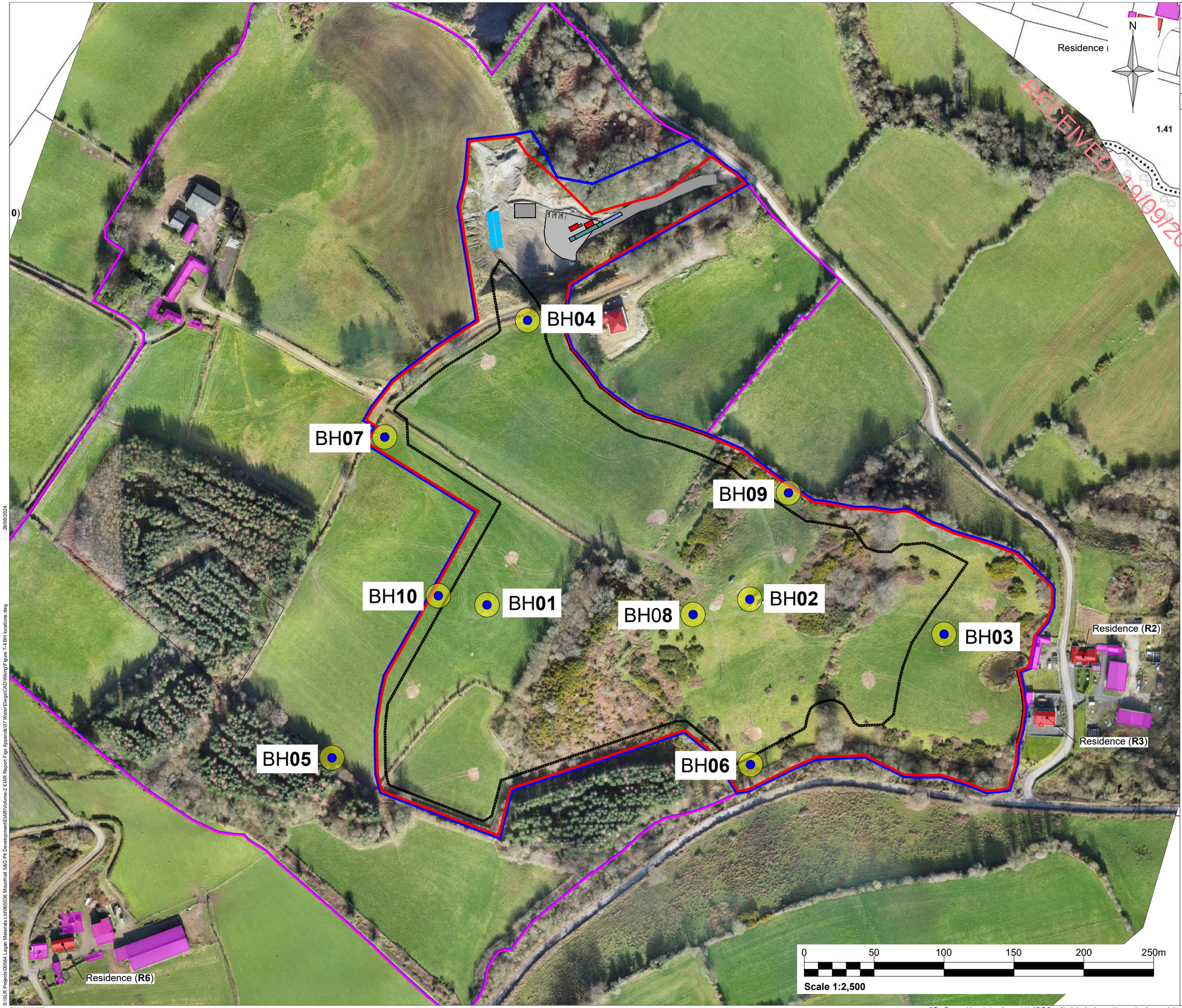

RECEIVED: 19/09/2024

Notes:

1. Extract from Ordnance Survey Discovery Series Map No. 54.
2. Extract from drone survey.

Legend:

- Landowner Boundary (c.32.1 Hectares)
  Third party landowner's land interest
- Planning Application Area (c.12.2 Hectares)
- Applicants Land Interest Area (c.12.4 Hectares)
  under lease agreement from landowner
- Proposed S&G Extraction Area (c.8 hectares)
- Residential property
- Agricultural shed / other building (non-residential)

Rev	Amendments	Date	By	Chk	Auth

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WINDY ARBOUR,
DUBLIN,
IRELAND,
D14 N2Y7

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Client
Breedon Ireland

Project
Sand and Gravel Pit Extension Development, Mounthall, Camross, Co. Laois

Figure Title
Borehole Locations Map

Scale	SLR Project No.
1:2,500 @ A3	00584.065036

Designed	Drawn	Checked	Authorised
SMcD	SMcD	DB	DB
Date	Date 02/24	Date 09/24	Date 09/24

Figure Number **Figure 7-4** Rev. **R1**

28/08/2024

S:\SLR Projects\00584 Lagan Materials Ltd\065036 Mounthall S&G Pit Development\EIAR\Volume-2 EIAR Report Figs Appends\07 Water\Dwgs\CAD\Wking\Figure 7-4 BH locations.dwg

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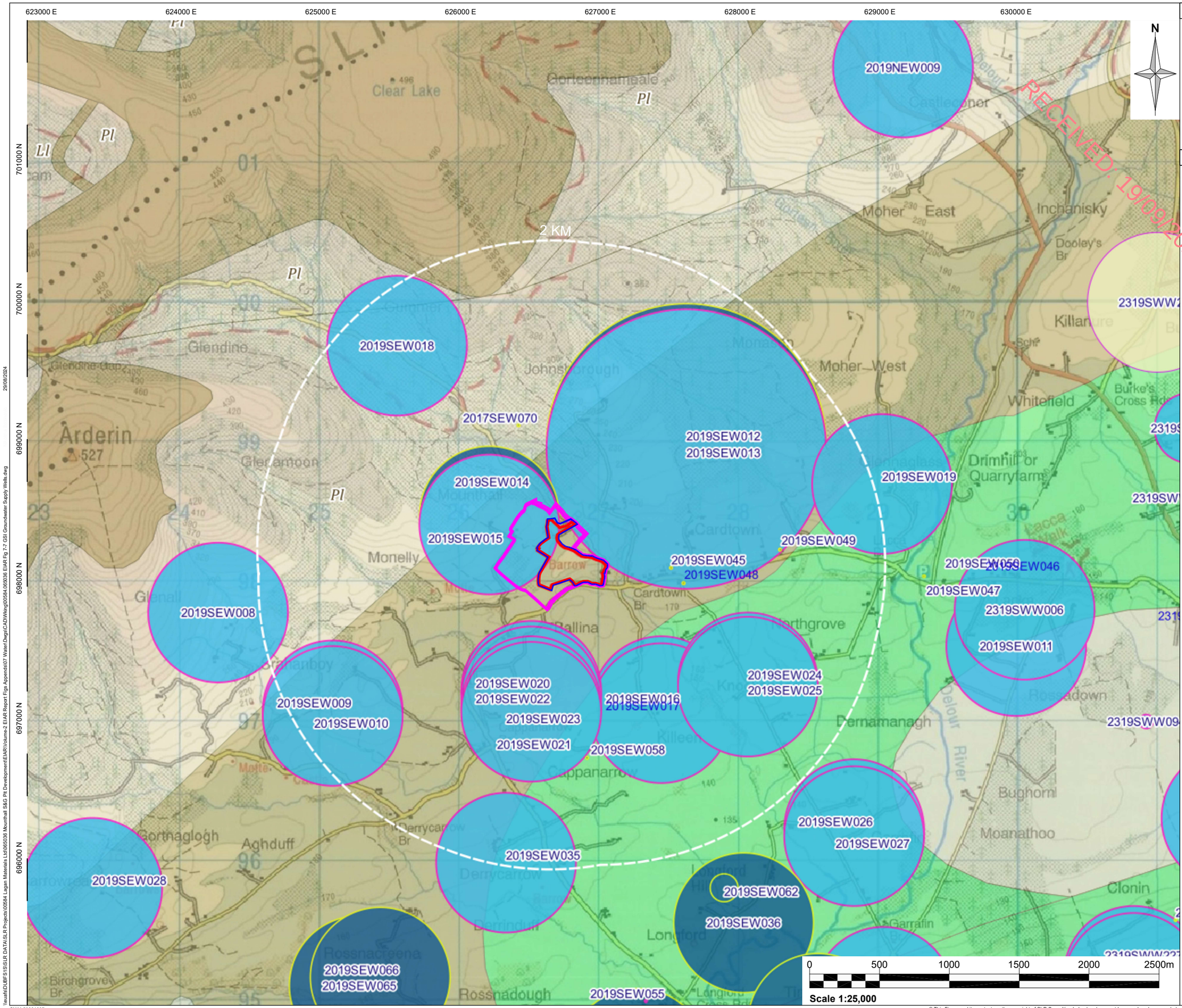

Notes:

1. Extract from Ordnance Survey Discovery Series Map No. 54
2. Extract from GSI BEDROCK AQUIFER & GROUNDWATER WELLS © GSI

RECEIVED: 19/09/2024

Legend:

LANDOWNER BOUNDARY (C.32.1 HECTARES)
Third party landowner's land interest

PLANNING APPLICATION AREA (C.12.2 HECTARES)

APPLICANTS LAND INTEREST AREA (C.12.4 HECTARES)
under lease agreement from landowner

GSI WELLS:

WELLS FOR DOMESTIC USE ONLY

WEELS FOR AGRICULTURAL & DOMESTIC USE

UNSPECIFIED USE IN GSI DATABASE

GSI BEDROCK AQUIFERS:

PL - POOR AQUIFER, BEDROCK WHICH IS GENERALLY UNPRODUCTIVE

LI - LOCALLY IMPORTANT AQUIFER - BEDROCK WHICH IS MODERATELY PRODUCTIVE ONLY IN LOCAL ZONES

Rf- REGIONALLY IMPORTANT AQUIFER - FISSURED BEDROCK

Rev	Amendments	Date	By	Chk	Auth

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Client
Breedon Ireland

Project
Sand and Gravel Pit Extension Development, Mounthall, Camross, Co. Laois

Figure Title
GSI Groundwater Supply Wells

Scale		SLR Project No.	
1:25,000	@ A3	501.00584.065036	
Designed	Drawn	Checked	Authorised
NB	NB	PG	PG
Date	Date	Date	Date
03/24	03/24	07/24	07/24

Figure Number
FIGURE 7-7A

Rev.
R0

0 500 1000 1500 2000 2500m

Scale 1:25,000

\\sua\DUBFS1\SLR DATA\SLR Projects\00584 Lagan Materials Ltd\065036 Mounthall S&G Pit Development\EIAR\Volume-2 EIAR Report Figs Appends\07 Water\Dwgs\CAD\Wking\00584.065036 EIAR Fig 7-7 GSI Groundwater Supply Wells.dwg

29/08/2024

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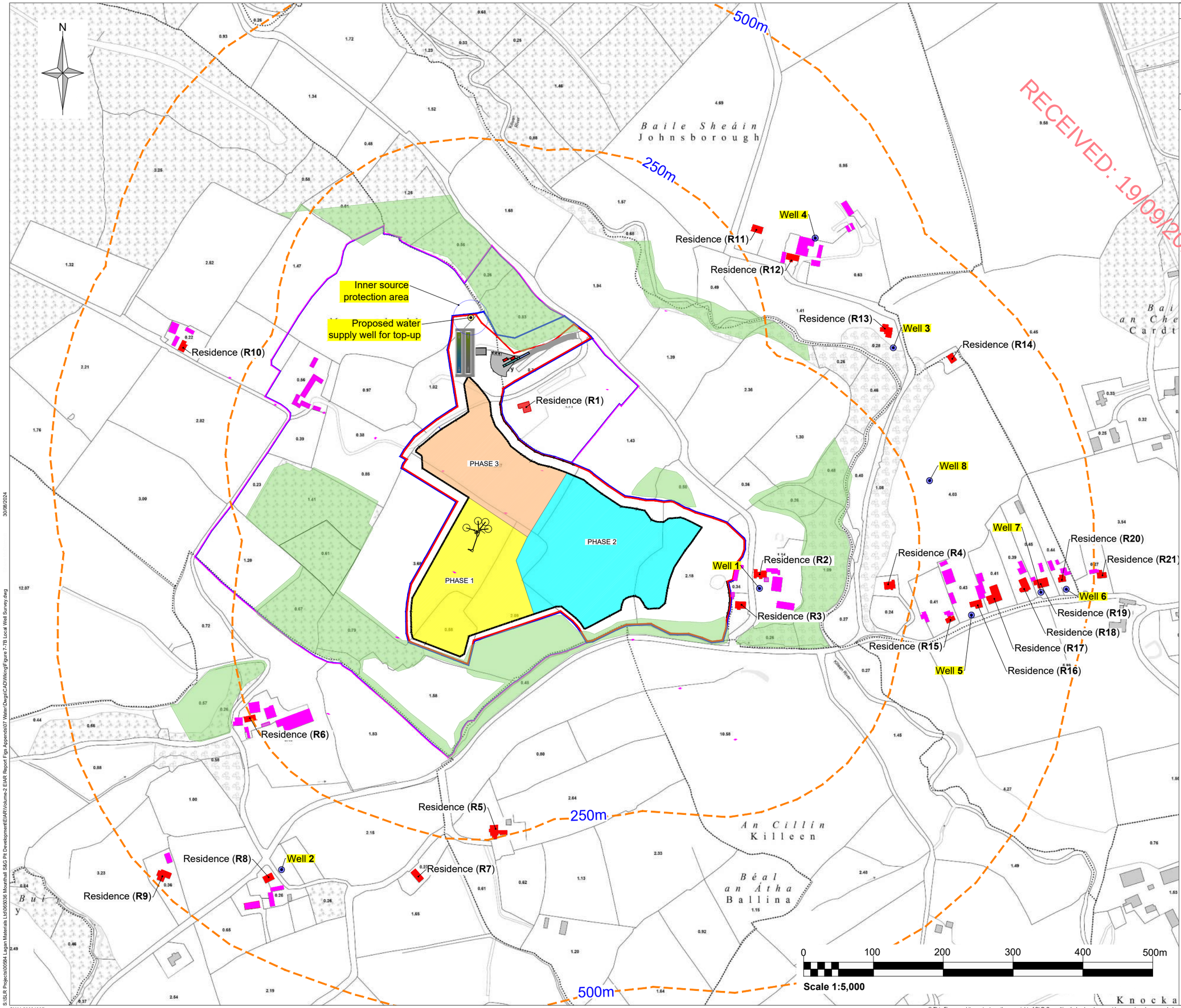

Notes:

1. Extract from Ordnance Survey 5,000 scale mapping - sheet numbers 3880, 3881, 3937, 3938

Legend:

- Landowner Boundary (c.32.1 Hectares)
  Third party landowner's land interest
- Planning Application Area (c.12.2 Hectares)
- Applicants Land Interest Area (c.12.4 Hectares)
  under lease agreement from landowner
- Proposed S&G Extraction Area (c.8 Hectares)
- Residential Property
- Agricultural Shed / Other Building (non-residential)
- Proposed borehole for water supply top-up
- Wells where access was gained for Well Survey (within 500m)

Rev	Amendments	Date	By	Chk	Auth

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7 DUNDRUM BUSINESS PARK,
WINDY ARBOUR,
DUBLIN,
IRELAND,
D14 N2Y7

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Client
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Project
Sand and Gravel Pit Extension Development, Mounthall, Camross, Co. Laois

Figure Title
Local Residence Well Survey (within 500m)

Scale	SLR Project No.
1:2,500 @ A3	00584.065036

Designed	Drawn	Checked	Authorised
SMcD	SMcD	DB	DB
Date	Date	Date	Date
Jan 2024	Jan 2024	09/24	09/24

Figure Number
Figure 7-7B

Rev.

S:\SLR Projects\00584 Lagan Materials Ltd\065036 Mounthall S&G Pit Development\EIAR\Volume-2 EIAR Report Figs Appends\07 Water\Dwgs\CAD\Wking\Figure 7-7B Local Well Survey.dwg
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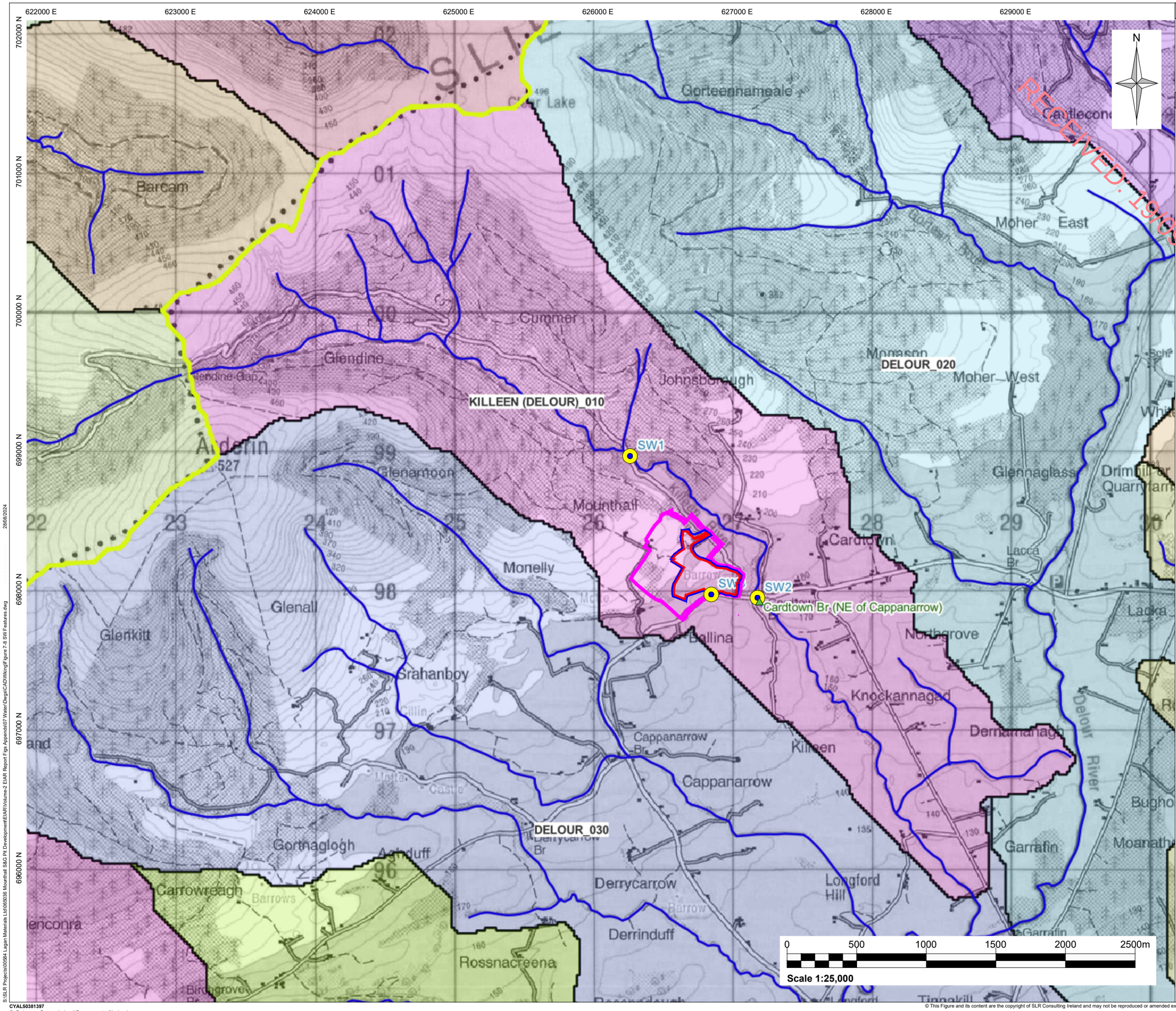

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Notes:

1. Extract from Ordnance Survey Discovery Series Map No. 54
2. Extract from WFD Catchments © EPA

Legend:

- Landowner Boundary (c.32.1 Hectares)
  Third party landowner's land interest
- Planning Application Area (c.12.2 Hectares)
- Applicants Land Interest Area (c.12.4 Hectares)
  under lease agreement from landowner
- Catchment Boundary
- Subcatchment Boundary
- River Flow
- Surface water sampling points
- EPA Monitoring station, cardtown br (NE of Cappanarrow)

Catchments (WFD Sub-Catchments):

- Killeen (Delour)_010
- Delour_020
- Delour_030
- Camcor_010
- Glenfelly Stream_010
- Roscomore Stream_010
- Tonet_020

Rev	Amendments	Date	By	Chk	Auth

SLR

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Client
Breedon Ireland

Project
Sand and Gravel Pit Extension Development, Mounthall, Camross, Co. Laois

Figure Title
Surface Water Features

Scale	SLR Project No.
1:25,000 @ A3	501.00584.065036

Designed	Drawn	Checked	Authorised
NB	NB	DB	DB
Date 03/24	Date 03/24	Date 09/24	Date 09/24

Figure Number **Figure 7-8** Rev. **R0**

28/08/2024

S:\SLR Projects\00584 Lagan Materials Ltd\065036 Mounthall S&G Pit Development\EIAR\Volume-2 EIAR Report Figs Append\07 Water\Dwgs\CAD\Wking\Figure 7-8 SW Features.dwg

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Appendices

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Appendix 7-A
EU Directives / National Legislation and Regulations / Guidelines / Technical Standards

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European Directives

- Environmental Impact Assessment. Directive (2011/92/EU) on the assessment of the effects of certain public and private projects on the environment;
- Environmental Impact Assessment Directive (2014/52/EU) on the assessment of the effects of certain public and private projects on the environment;
- Water Framework Directive (2000/60/EC);
- Groundwater Directive (2006/118/EC);
- Flooding Directive (2007/60/EC)
- Integrated Pollution and Prevention Control Directive (2008/1/EC); and
- The management of waste from extractive industries (2006/21/EC).

Irish Government Acts, National Legislation and Regulations

- S.I. No. 349 of 1989, European Communities (Environmental Impact Assessment) Regulations, and subsequent amendments (S.I. No. 84 of 1994, S.I. No. 352 of 1998, S.I. No. 93 of 1999, S.I. No. 450 of 2000 and S.I. No. 538 of 2001);
- The Planning and Development Acts, 2000 to 2009, The Planning and Development (Amendment) Act 2010, S.I. 600 of 2001 Planning and Development Regulations and subsequent amendments including, S.I. No. 364 of 2005 and S.I. 685 of 2006.

National legislation on the protection of the water environment. Since 2000 water management in EU member states has primarily been directed by the Water Framework Directive (2000/60/EC) and the associate 'daughter' Groundwater Directive (2006/118/EC). Irish legislation implementing these, and other relevant directives currently includes:

- S.I. No. 9 of 2010 European Communities Environmental Objectives (Groundwater) Regulations 2010 and amendments (S.I. No. 389 of 2011 and S.I. No. 149 of 2012);
- European Union (Drinking Water) Regulations 2014 (S.I. No. 122 of 2014);
- S.I. No. 278 of 2007 European Communities (Drinking Water) (No. 2) Regulations;
- S.I. No. 272 of 2009 European Communities Environmental Objectives (Surface Waters) Regulations 2009 and amendment (S.I. No. 327 of 2012);
- S.I. No. 684 of 2007 Waste Water Discharge (Authorisation) Regulations, 2007, as amended (S.I. No. 231 of 2010);
- S.I. No. 122 of 2010 European Communities (Assessment and Management of Flood Risks) Regulations 2010;
- S.I. No. 457 of 2008 European Communities (Environmental Liability) Regulations which bring into force the European Liability Directive (2004/35/EC);
- European Union (Planning and Development) (Environmental Impact Assessment) (No. 2) Regulations 2018 (S.I. No. 404 of 2018);
- Local Government (Water Pollution) Acts 1977 to 1998;
- European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 293 of 1988);
- European Communities (Quality of Shellfish Waters) Regulations, 2006 (S.I. No. 268 of 2006) and amendments (S.I No. 55 and 464 of 2009), and;

RECEIVED: 19/09/2024

- Bathing Water Quality Regulations, 2008 (S.I. No. 79 of 2008) and amendments (S.I No. 351 of 2011 and S.I. No. 163 of 2016);

Guidelines

- CIS (2007). Common Implementation Strategy (CIS) for the Water Framework Directive (2000/60/EC) Guidance on preventing or limiting direct and indirect inputs in the context of the Groundwater Directive 2006/118/EC. Guidance Document No. 17.
- CIS (2010). Common Implementation Strategy (CIS) for the Water Framework Directive (2000/60/EC). Guidance on risk assessment and the use of conceptual models for groundwater. Guidance document No. 26.
- DEHLG (2004). National Urban Waste Water Study. National Report.
- DEHLG (2009). Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities.
- DELG/EPA/GSI (1999). Groundwater Protection Schemes. Document prepared jointly by the Geological Survey of Ireland (GSI), the Environmental Protection Agency, and the Department of Environment, Heritage and Local Government.
- EPA (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- EPA (2010b). Methodology for Establishing Groundwater Threshold Values and the Assessment of Chemical and Quantitative Status of Groundwater, Including and Assessment of Pollution Trends and Trend Reversal.
- EPA (2011). Guidance on the Authorisation of Discharges to Groundwater. Version 1, December 2011.
- EPA (2003). Towards Setting Guideline Values for the Protection of groundwater in Ireland. Interim Report.
- EPA (2006). Ireland Water Framework Directive Monitoring Programme.
- Fitzsimons, V., Daly, D. and Deakin, J. (2003). Draft GSI guidelines for assessment and mapping of groundwater vulnerability to contamination. Groundwater Chapter, Geological Survey of Ireland.
- GSI (2006). Criteria used in aquifer classification. 1Available from http://www.gsi.ie/Programmes/Groundwater/Aquifer+Classification.htm
- IGI (2007). Guidelines on Water Well Construction. Available from http://www.igi.ie/assets/files/Water%20Well%20Guidelines/Guidelines.pdf
- Kilroy, G., Dunne, F., Ryan, J., O'Connor, A., Daly, D., Craig, M., Coxon, C., Johnston, P. and Moe, H. (2008). A Framework for the Assessment of Groundwater – Dependent Terrestrial Ecosystems under the Water Framework Directive. Environmental Research Centre Report Series No. 12.
- Institute of Geologists of Ireland, 2007. Recommended collection, presentation and interpretation of geological and hydrogeological information for quarry developments.

Technical Standards

- British Standards (2015). Code of Practice for Ground Investigations BS5930:2015;.
- CIRIA (2007). The SuDS Manual. (C697). CIRIA publication, February 2007.

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Appendix 7-B
On Site Rain Gauge Daily Readings

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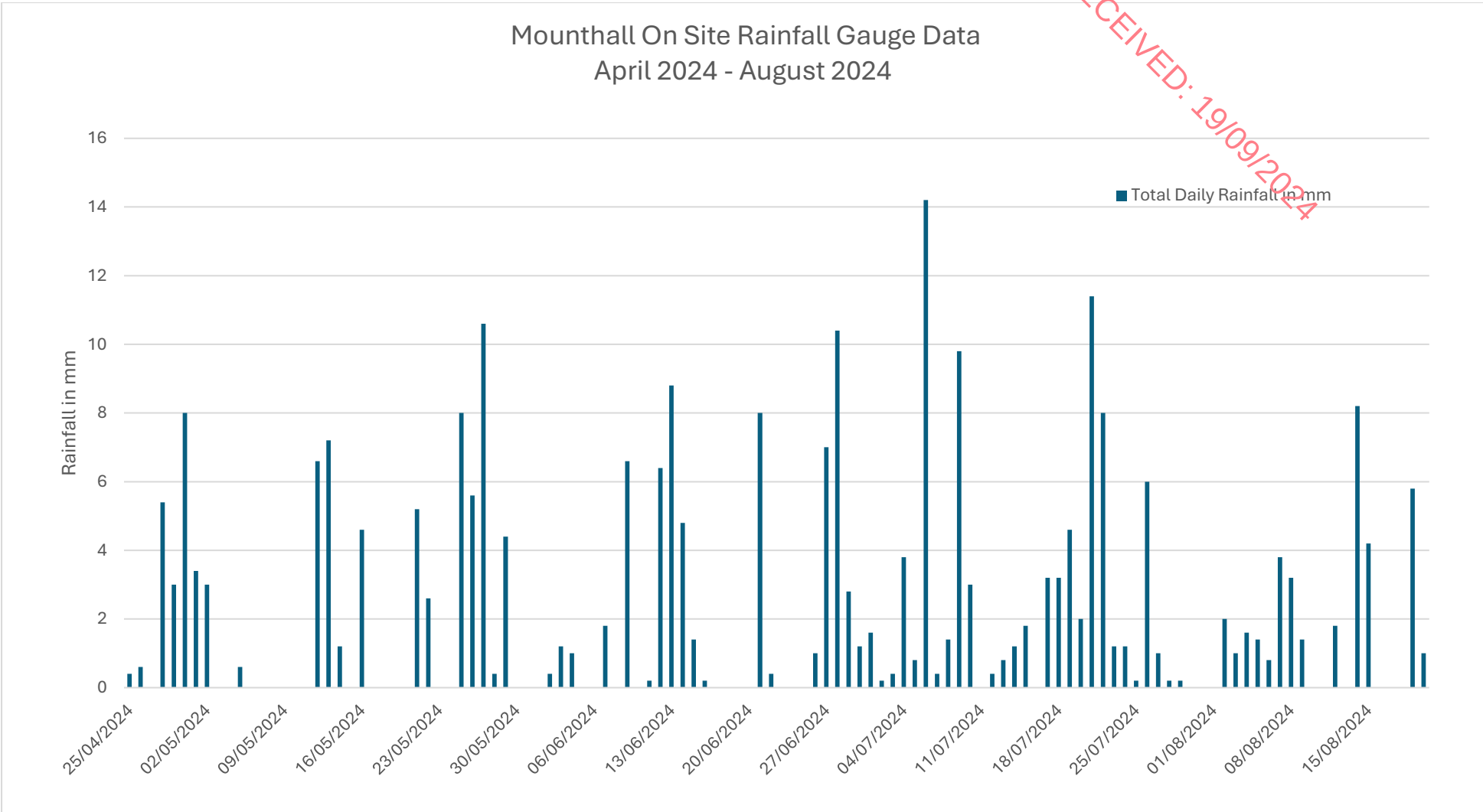

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Appendix 7-C
Borehole Logs

BOREHOLE LOG

BOREHOLE No
BH 01

RECEIVED: 19/09/2024

Client:
Breedon Ireland

SLR

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	15/02/2023	197.52m	E626571 N698126

Project:
Mounthall S&G Pit

Sheet
1 of 2

SAMPLES & TESTS				Water	STRATA					
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument	Backfill
					197.02		(0.50) 0.50	Grass over brown TOPSOIL		
1, 2							(4.00)	Brown fine and medium SAND (dry).		
3								*3.00 Brown gravelly silty fine and medium SAND.*		
4					193.02		4.50			
5								Damp brown slightly gravelly fine and medium SAND. Gravel is rounded.		
6								*6.00 Yellowish brown silty very sandy medium and coarse GRAVEL*		
7							(6.00)			
8										
9								*9.00 Brown silty very gravelly medium SAND*		

Borehole Continued on Next Page

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To	
15/02/2023	4.50									50mm standpipe installed. Response zone 2.00m to 11.50m bgl. Bentonite (0.5 - 2.0m).
16/02/2023	11.50	11.00		Dry						

All dimensions in metres	Contractor: Irish Drilling Ltd	Method: Cable percussion (shell and auger)	Logged By:	Approved By:
Scale 1:66	Plant: Dando 2000	Hole Size: 203mm	BT	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 01

RECEIVED: 19/09/2024

Client:
Breedon Ireland

SLR

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	15/02/2023	197.52m	E626537 N698139

Project:
Mounthall S&G Pit

Sheet
2 of 2

SAMPLES & TESTS				Water	STRATA				
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument Backfill
					187.02		10.50	Damp brown slightly gravelly fine and medium SAND. Gravel is rounded.	
11					186.02		(1.00) 11.50	Stiff reddish brown slightly sandy slightly gravelly SILT/CLAY with medium cobble content.	
								Borehole Complete at 11.50m	
12									
13									
14									
15									
16									
17									
18									
19									

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To	50mm standpipe installed. Response zone 2.00m to 11.50m bgl. Bentonite (0.5 - 2.0m).

All dimensions in metres	Contractor: Irish Drilling Ltd	Method: Cable percussion (shell and auger)	Logged By:	Approved By:
Scale 1:66	Plant: Dando 2000	Hole Size: 203mm	BT	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 02

RECEIVED: 19/09/2024

Client:
Breedon Ireland

SLR

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	20/02/2023	195.87m AOD	E626762 N698132

Project:
Mounthall S&G Pit

Sheet
1 of 3

SAMPLES & TESTS				Water	STRATA					
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument	Backfill
					195.37		(0.50) 0.50	Grass over brown TOPSOIL		
1, 2							(4.00)	Brown fine and medium SAND with medium cobble content (dry).		
3								*3.00 Orange brown gravelly silty medium SAND.*		
4					191.37		4.50			
5, 6, 7, 8, 9								Brown sandy GRAVEL with medium cobble content. Gravel is rounded. *7.50 Brown slightly sandy slightly gravelly SILT.*		

Borehole Continued on Next Page

Boring Progress and Water Observations				
Date	Depth	Casing Dpt	Casing Dia	Water Dpt
20/02/2023	4.00			
21/02/2023	15.00			
22/02/2023	23.00	22.00		Dry

Chiselling			Water Added	
From	To	Hours	From	To
15.60	16.50	02:00		

General Remarks

50mm standpipe installed response zone 2.90m to 23.00m bgl.

Bentonite (0.4 -2.9m).

All dimensions in metres	Contractor: Irish Drilling Ltd	Method: Cable percussion (shell and auger)	Logged By:	Approved By:
Scale 1:66	Plant: Dando 2000	Hole Size: 203mm	BT	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 02

RECEIVED: 19/09/2024

Client:
Breedon Ireland

SLR

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	20/02/2023	195.87m AOD	E626760 N698136

Project:
Mounthall S&G Pit

Sheet
2 of 3

SAMPLES & TESTS				Water	STRATA				
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument Backfill
								Brown sandy GRAVEL with medium cobble content. Gravel is rounded.	
11									
12									
13							(11.10)	*13.50 Bluish brown slightly silty very sandy GRAVEL.*	
14									
15					180.27		15.60		
								Brown rounded and subrounded GRAVEL and COBBLES with low boulder content.	
16					179.37		(0.90) 16.50		
								Brown coarse SAND.	
17									
18							(3.10)	*18.00 Greyish brown gravelly silty medium and coarse SAND.*	
19					176.27		19.60		
								Dense brown sandy GRAVEL.	

Borehole Continued on Next Page

Boring Progress and Water Observations				
Date	Depth	Casing Dpt	Casing Dia	Water Dpt

Chiselling			Water Added	
From	To	Hours	From	To
15.60	16.50	02:00		

General Remarks

50mm standpipe installed response zone 2.90m to 23.00m bgl.

Bentonite (0.4 -2.9m).

All dimensions in metres	Contractor: Irish Drilling Ltd	Method: Cable percussion (shell and auger)	Logged By:	Approved By:
Scale 1:66	Plant: Dando 2000	Hole Size: 203mm	BT	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 02

RECEIVED: 19/09/2024

Client:
Breedon Ireland

SLR

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	20/02/2023	195.87m AOD	E626760 N698136

Project:
Mounthall S&G Pit

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SAMPLES & TESTS				Water	STRATA				
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument / Backfill
							(1.90)	Dense brown sandy GRAVEL. *21.00 Light brown very silty GRAVEL and SAND.*	
					174.37		21.50		
							(1.50)	Stiff reddish brown slightly sandy slightly gravelly SILT/CLAY with medium cobble content.	
					172.87		23.00		
								Borehole Complete at 23.00m	

21 22 23 24 25 26 27 28 29

Boring Progress and Water Observations					Chiselling			Water Added	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To
					15.60	16.50	02:00		

General Remarks

50mm standpipe installed response zone 2.90m to 23.00m bgl.

Bentonite (0.4 -2.9m).

All dimensions in metres	Contractor: Irish Drilling Ltd	Method: Cable percussion (shell and auger)	Logged By:	Approved By:
Scale 1:66	Plant: Dando 2000	Hole Size: 203mm	BT	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 03

RECEIVED: 19/09/2024

Client:
Breedon Ireland

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	07/02/2024	181.38m AOD	E626900 N698105

Project:
Mounthall S&G Pit

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1 of 2

SAMPLES & TESTS				Water	STRATA					
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument	Backfill
							(3.40)	Brown fine and medium SAND with medium cobble content (dry).		
					177.98		3.40	*3.00 Orange brown silty very sandy GRAVEL. Sand is medium and coarse*		
					177.38		(0.60) 4.00	Dense brown sandy GRAVEL and COBBLES with medium boulder content. Boulders are angular.		
					172.48		(4.90) 8.90	Dense brown SAND and GRAVEL with medium cobble content. *6.00 Light brown silty very sandy medium and coarse GRAVEL.*		
							(1.60)	Wet reddish brown fine and medium SAND.		

Borehole Continued on Next Page

Boring Progress and Water Observations					Chiselling			Water Added	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To
23/02/2023	4.00				3.50	4.00	01:00		
24/02/2023	12.00	11.00		Dry	6.80	7.30	01:00		

General Remarks

50mm standpipe installed - response zone 2.90m to 11.00m bgl.

Bentonite (0.5 -2.9m).

All dimensions in metres	Contractor: Irish Drilling Ltd	Method: Cable percussion (shell and auger)	Logged By:	Approved By:
Scale 1:66	Plant: Dando 2000	Hole Size: 203mm	BT	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 03

RECEIVED: 19/09/2024

Client:
Breedon Ireland

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	07/02/2024	181.38m AOD	E626899 N698111

Project:
Mounthall S&G Pit

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SAMPLES & TESTS				Water	STRATA				
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument / Backfill
					170.88		10.50	Wet reddish brown fine and medium SAND.	
11					169.38		(1.50) 12.00	Firm reddish brown slightly sandy slightly gravelly SILT/CLAY.	
12								Borehole Complete at 12.00m	
13									
14									
15									
16									
17									
18									
19									

Boring Progress and Water Observations				
Date	Depth	Casing Dpt	Casing Dia	Water Dpt

Chiselling			Water Added	
From	To	Hours	From	To
3.50	4.00	01:00		
6.80	7.30	01:00		

General Remarks

50mm standpipe installed - response zone 2.90m to 11.00m bgl.

Bentonite (0.5 -2.9m).

All dimensions in metres	Contractor: Irish Drilling Ltd	Method: Cable percussion (shell and auger)	Logged By:	Approved By:
Scale 1:66	Plant: Dando 2000	Hole Size: 203mm	BT	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 04

RECEIVED: 19/09/2024

Client:
Breedon Ireland

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	04/12/2023	204.43m AOD	E626497 N698248

Project:
Mounthall S&G Pit

Sheet
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SAMPLES & TESTS				Water	STRATA				
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument / Backfill
					204.23		0.20	Firm brown sandy TOPSOIL	
1							(7.20)	Loose coarse brown gravelly SAND	
2									
3									
4									
5									
6				▼					
7					197.03		7.40		
8							(1.90)	Firm to stiff brown very sandy gravelly SILT possible highly weathered Rock	
9					195.13		9.30		
								Weak highly weathered brownish red fine grained SANDSTONE	

Borehole Continued on Next Page

Boring Progress and Water Observations					Chiselling			Water Added	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To
04/12/2023	25.00	25.00		6.00					
04/12/2023	25.00	25.00		20.00					

General Remarks

50mm standpipe installed response zone 14.00m to 25.00m bgl. There is airlift development.

Bentonite (10.0-13.5m).

All dimensions in metres	Contractor: Peterson Drilling Services Ltd	Method: Rotary open hole	Logged By:	Approved By:
Scale 1:66	Plant: Knebel HY79	Hole Size: 120mm	SP	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 04

RECEIVED: 19/09/2024

Client:
Breedon Ireland

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	04/12/2023	204.43m AOD	E626601 N698336

Project:
Mounthall S&G Pit

Sheet 2 of 3

SAMPLES & TESTS				Water	STRATA					
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument	Backfill
								Weak highly weathered brownish red fine grained SANDSTONE		
11							(3.70)			
12										
13					191.43		13.00			
								Strong brown fine grained SANDSTONE occasional highly weathered layers		
14										
15										
16							(12.00)			
17										
18										
19										

Borehole Continued on Next Page

Boring Progress and Water Observations					Chiselling			Water Added	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To

General Remarks

50mm standpipe installed response zone 14.00m to 25.00m bgl. There is airlift development.

Bentonite (10.0-13.5m).

All dimensions in metres	Contractor: Peterson Drilling Services Ltd	Method: Rotary open hole	Logged By:	Approved By:
Scale 1:66	Plant: Knebel HY79	Hole Size: 120mm	SP	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 04

RECEIVED: 19/09/2024

Client:
Breedon Ireland

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	04/12/2023	204.43m AOD	E626601 N698336

Project:
Mounthall S&G Pit

Sheet
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SAMPLES & TESTS				Water	STRATA				
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument Backfill
								Strong brown fine grained SANDSTONE occasional highly weathered layers	
21									
22									
23									
24									
25					179.43		25.00		
								Borehole Complete at 25.00m	
26									
27									
28									
29									

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To	50mm standpipe installed response zone 14.00m to 25.00m bgl. There is airlift development. Bentonite (10.0-13.5m).

All dimensions in metres	Contractor: Peterson Drilling Services Ltd	Method: Rotary open hole	Logged By:	Approved By:
Scale 1:66	Plant: Knebel HY79	Hole Size: 120mm	SP	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 05

RECEIVED: 19/09/2024

Client:
Breedon Ireland

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	05/12/2023	193.67m AOD	E626456 N698027

Project:
Mounthall S&G Pit

Sheet
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SAMPLES & TESTS				Water	STRATA				
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument / Backfill
					193.47		0.20	Soft to firm brown TOPSOIL	
1					191.87		(1.60) 1.80	Medium dense brown very silty gravelly SAND	
2, 3, 4					189.07		(2.80) 4.60	Medium dense brown silty gravelly SAND	
5, 6, 7					186.17		(2.90) 7.50	Loose medium coarse brownish gravelly SAND	
8, 9					184.27		(1.90) 9.40	Weak highly weathered brownish red SANDSTONE	
				▼				Strong brown fine grained SANDSTONE with occasional weathered layers	

Borehole Continued on Next Page

Boring Progress and Water Observations				
Date	Depth	Casing Dpt	Casing Dia	Water Dpt
05/12/2023	15.00	15.00		9.5

Chiselling			Water Added	
From	To	Hours	From	To

General Remarks

50mm standpipe installed response zone 9.00m to 15.00m bgl. There is airlift development.

Bentonite (5.50-8.50m).

All dimensions in metres	Contractor: Peterson Drilling Services Ltd	Method: Rotary open hole	Logged By:	Approved By:
Scale 1:66	Plant: Knebel HY79	Hole Size: 120mm	SP	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 05

RECEIVED: 19/09/2024

Client:
Breedon Ireland

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	05/12/2023	193.67m AOD	E626461 N698023

Project:
Mounthall S&G Pit

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SAMPLES & TESTS				Water	STRATA				
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument Backfill
							(5.60)	Strong brown fine grained SANDSTONE with occasional weathered layers	
					178.67		15.00		
								Borehole Complete at 15.00m	

11
12
13
14
15
16
17
18
19

Boring Progress and Water Observations					Chiselling			Water Added	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To

General Remarks

50mm standpipe installed response zone 9.00m to 15.00m bgl. There is airlift development.

Bentonite (5.50-8.50m).

All dimensions in metres	Contractor: Peterson Drilling Services Ltd	Method: Rotary open hole	Logged By:	Approved By:
Scale 1:66	Plant: Knebel HY79	Hole Size: 120mm	SP	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 06

RECEIVED: 19/09/2024

Client:
Breedon Ireland

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	21/02/2024	176.299m AOD	E626763 N698015

Project:
Mounthall S&G Pit

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SAMPLES & TESTS				Water	STRATA				
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument / Backfill
					181.53		(0.60) 0.60	Grass over soft to firm brown sandy CLAY	
1, 2				▼	179.13		(2.40) 3.00	Brown sandy COBBLES	
3					178.13		(1.00) 4.00	Stiff brown sandy CLAY with cobbles.	
4								Borehole Complete at 4.00m	
5, 6, 7, 8, 9									

Boring Progress and Water Observations					Chiselling			Water Added	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To
21/02/2024	4.00	4.00		2.2	3.50	4.00	01:00		

General Remarks

50mm standpipe installed response zone 2.00m to 04.00m bgl.

Bentonite (1.5 -3.0m)

All dimensions in metres	Contractor: Irish Drilling Ltd	Method: Cable percussion (shell and auger)	Logged By:	Approved By:
Scale 1:66	Plant: Dando 2000	Hole Size: 203mm	BT	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 07

RECEIVED: 19/09/2024

Client:
Breedon Ireland

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	07/02/2024	208.52m	E626499 N698252

Project:
Mounthall S&G Pit

Sheet 1 of 1

SAMPLES & TESTS				Water	STRATA				
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument / Backfill
							(1.20)	Grass over firm brown sandy CLAY with cobbles.	
1					207.32		1.20		
							(4.20)	Reddish brown SAND	
2									
3				▼					
4									
5					203.12		5.40		
					202.82		5.70	Stiff reddish brown sandy gravelly CLAY with cobbles and boulders.	
6					202.32		(0.50) 6.20	Grey siltstone.	
								Borehole Complete at 6.20m	
7									
8									
9									

Boring Progress and Water Observations				
Date	Depth	Casing Dpt	Casing Dia	Water Dpt
07/02/2024	6.20	6.00		3.00

Chiselling		
From	To	Hours
4.10	4.50	01:00
6.00	6.20	01:00

Water Added	
From	To

General Remarks

BH terminated at 6.20 mbgl. Obstruction as weathered rock. 50mm standpipe installed response zone 2.20m to 6.20m bgl. Bentonite (1.5 - 2.2m).

All dimensions in metres	Contractor: Irish Drilling Ltd	Method: Cable percussion (shell and auger)	Logged By:	Approved By:
Scale 1:66	Plant: Dando 2000	Hole Size: 203mm	BT	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 08

RECEIVED: 19/09/2024

Client:
Breedon Ireland

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	09/02/2024	199.31m AOD	E626721 N698126

Project:
Mounthall S&G Pit

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SAMPLES & TESTS				Water	STRATA					
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument	Backfill
					198.71		(0.60) 0.60	Grass over firm brown sandy CLAY.		
1, 2, 3, 4, 5					193.31		(5.40) 6.00	Brown SAND with cobbles.		
6, 7					191.81		(1.50) 7.50	Brown SAND.		
8, 9								Brown sandy GRAVEL.		

Borehole Continued on Next Page

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To	
09/02/2023	5.00									BH terminated at 24.20m bgl on REs instruction. 50mm standpipe installed response zone 18.00m to 24.20m bgl.
12/02/2024	14.00									
13/02/2024	21.00	24.00		Dry						Bentonite (16.0 - 17.0m)

All dimensions in metres	Contractor: Irish Drilling Ltd	Method: Cable percussion (shell and auger)	Logged By:	Approved By:
Scale 1:66	Plant: Dando 2000	Hole Size: 203mm	BT	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 08

RECEIVED: 19/09/2024

Client:
Breedon Ireland

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	09/02/2024	199.31m AOD	E626719 N698125

Project:
Mounthall S&G Pit

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SAMPLES & TESTS				Water	STRATA					
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument	Backfill
								Brown sandy GRAVEL.		
11										
12										
13							(9.00)			
14										
15										
16					182.81		16.50			
								Brown silty SAND.		
17										
18										
19										
								Borehole Continued on Next Page		

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To	
										BH terminated at 24.20m bgl on REs instruction. 50mm standpipe installed response zone 18.00m to 24.20m bgl. Bentonite (16.0 - 17.0m)

All dimensions in metres	Contractor: Irish Drilling Ltd	Method: Cable percussion (shell and auger)	Logged By:	Approved By:
Scale 1:66	Plant: Dando 2000	Hole Size: 203mm	BT	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 08

RECEIVED: 19/09/2024

Client:
Breedon Ireland

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	09/02/2024	199.31m AOD	E626719 N698125

Project:
Mounthall S&G Pit

Sheet
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SAMPLES & TESTS				Water	STRATA				
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument Backfill
							(7.10)	Brown silty SAND.	
					175.71		23.60		
					175.11		(0.60) 24.20	Brown neo-brown CLAY	
								Borehole Complete at 24.20m	

21 22 23 24 25 26 27 28 29

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To	BH terminated at 24.20m bgl on REs instruction. 50mm standpipe installed response zone 18.00m to 24.20m bgl. Bentonite (16.0 - 17.0m)

All dimensions in metres	Contractor: Irish Drilling Ltd	Method: Cable percussion (shell and auger)	Logged By:	Approved By:
Scale 1:66	Plant: Dando 2000	Hole Size: 203mm	BT	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 09

RECEIVED: 19/09/2024

Client:
Breedon Ireland

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	15/02/2024	198.858m AOD	E626785 N698214

Project:
Mounthall S&G Pit

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SAMPLES & TESTS				Water	STRATA					
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument	Backfill
							(0.70)	Grass over soft to firm brown sandy CLAY.		
					197.92		0.70	Brown SAND		
1										
2										
3										
4										
5							(15.50)			
6										
7										
8										
9										

Borehole Continued on Next Page

Boring Progress and Water Observations				
Date	Depth	Casing Dpt	Casing Dia	Water Dpt
15/02/2024	10.00			
16/02/2024	18.00			
19/02/2024	25.30	24.50		23.0

Chiselling			Water Added	
From	To	Hours	From	To

General Remarks

50mm standpipe installed response zone 19.30m to 25.30m bgl.

Bentonite (17.30 -18.30m).

All dimensions in metres	Contractor: Irish Drilling Ltd	Method: Cable percussion (shell and auger)	Logged By:	Approved By:
Scale 1:66	Plant: Dando 2000	Hole Size: 203mm	BT	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 09

RECEIVED: 19/09/2024

Client:
Breedon Ireland

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	15/02/2024	198.62m AOD	E626788 N698212

Project:
Mounthall S&G Pit

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SAMPLES & TESTS				Water	STRATA				
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument / Backfill
11								Brown SAND	
12									
13									
14									
15									
16					182.42		16.20		
17							(1.80)	Brown coarse SAND with cobbles.	
18					180.62		18.00		
19							(1.50)	Brown coarse sandy GRAVEL with cobbles.	
					179.12		19.50		
								Brown silty SAND.	

Borehole Continued on Next Page

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To	50mm standpipe installed response zone 19.30m to 25.30m bgl. Bentonite (17.30 -18.30m).

All dimensions in metres	Contractor: Irish Drilling Ltd	Method: Cable percussion (shell and auger)	Logged By:	Approved By:
Scale 1:66	Plant: Dando 2000	Hole Size: 203mm	BT	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 09

RECEIVED: 19/09/2024

Client:
Breedon Ireland

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	15/02/2024	198.62m AOD	E626788 N698212

Project:
Mounthall S&G Pit

Sheet
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SAMPLES & TESTS				Water	STRATA				
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument Backfill
								Brown silty SAND.	
21									
22							(4.50)		
23				▼					
24					174.62		24.00		
							(1.30)	Firm reddish brown sandy gravelly CLAY with cobbles and boulders	
25					173.32		25.30		
								Borehole Complete at 25.30m	
26									
27									
28									
29									

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To	50mm standpipe installed response zone 19.30m to 25.30m bgl. Bentonite (17.30 -18.30m).

All dimensions in metres	Contractor: Irish Drilling Ltd	Method: Cable percussion (shell and auger)	Logged By:	Approved By:
Scale 1:66	Plant: Dando 2000	Hole Size: 203mm	BT	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

BOREHOLE LOG

BOREHOLE No
BH 10

RECEIVED: 19/09/2024

Client:
Breedon Ireland

Project No:	Date:	Ground Level:	Co-ordinates:
501.065036.00001	08/02/2024	198.09m AOD	E626537 N698139

Project:
Mounthall S&G Pit

Sheet
1 of 1

SAMPLES & TESTS				Water	STRATA				
Depth	Type No	Test Type	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Instrument Backfill
					197.29		(0.80) 0.80	Grass over soft to firm brown sandy CLAY.	
1, 2, 3, 4, 5					192.29		(5.00) 5.80	Brown SAND with cobbles.	
6					191.19		(1.10) 6.90	GRAVEL with bands of fine sand.	
7					190.89		7.20	Stiff reddish brown silty CLAY.	
					190.29		(0.60) 7.80	Weathered rock.	
8, 9								Borehole Complete at 7.80m	

Boring Progress and Water Observations					Chiselling			Water Added	
Date	Depth	Casing Dpt	Casing Dia	Water Dpt	From	To	Hours	From	To
08/02/2024	7.80			Dry	7.70	7.80	01:00		

General Remarks
BH terminated at 7.80m bgl. Obstruction as weathered rock. BH backfilled.

All dimensions in metres	Contractor: Irish Drilling Ltd	Method: Cable percussion (shell and auger)	Logged By:	Approved By:
Scale 1:66	Plant: Dando 2000	Hole Size: 203mm	BT	DB

LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930:2015+A2:2020

RECEIVED: 19/09/2024

Appendix 7-D
Groundwater and Surface Water Field Record Sheets

Field Record Sheet

SLR

RECEIVED: 19/09/2024

Groundwater Sampling Field Record Sheet

Date:	24 April 2024	**Time:**	8.30 – 16.00 on site	**Location:**	Mounthall, Co. Laois
Staff:	Mairéad Brown			**SLR Project No.:**	501.065477.00001
Equipment	Dip meter, Aquatroll, Watterra, Scoop				

Table 1- Water Measurements

	BH01	BH02	BH03	BH04	BH05	BH06	BH07	BH08	BH09
Groundwater level (m bgl)	7.33	18.66	6.69	11.94	4.56	1.19	1.66	21.25	21.94
Total depth (m)	11.19	22.93	11.3	24.9	15.45	3.13	6.21	22.87	23.1
Volume of water in borehole (litres)	21.23	23.49	25.36	71.28	60	10.67	25	8.91	6.38
Volume purged (L)	30	30	30	75	68	15	37.5	15	-
Waterra / Bailer	Waterra	Waterra	Waterra	Waterra	Waterra	Bailer	Waterra	Bailer	-

Table 2 – Visual field parameters

Parameter	BH01	BH02	BH03	BH04	BH05	BH06	BH07	BH08	BH09
Odour	No	No	No	No	No	No	No	No	-
Sheen	No	No	No	No	No	No	Slight Hydrocarbon sheen	No	-
Silt	Low	Medium	High	Medium	High	High	High	V. High	-
Colour	Light brown, opaque	Light brown, opaque	Brown, opaque	Brown, opaque	Light brown, opaque	Brown, opaque	Brown, opaque	Brown, opaque	-
Free product	No	No	No	No	No	No	No	No	-

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Table 3 – Aquatroll Field Parameters

Parameter	BH01	BH02	BH03	BH04	BH05	BH06	BH07	BH08	BH09
Temperature (°C)	10.44	10.65	10.66	10.66	10.5	9.64	10.47	11.54	-
Specific conductivity (µS/cm)	157.1	421.39	477.32	472.17	364.11	331.55	481.33	429.83	-
Salinity (PSU)	0.07	0.2	0.23	0.23	0.17	0.16	0.23	0.21	-
pH	6.37	7.38	7.33	7.13	7.21	6.07	6.73	7.35	-
Total Dissolved Solids (ppt)	0.10	0.27	0.31	0.31	0.24	0.22	0.31	0.28	-
Turbidity (NTU)	245.71	3704.56	6923.43	2916.5	1937	2539.80	6369.58	3131.87	-
RDO Concentration (mg/L)	8.79	10.13	9.76	7.55	5.96	7.8	2.66	10.58	-

Other field observations:

BH06 – Pump refuelled >10m away.

BH07 – Pump refuelled >10m away.

BH09 – Unable to get a sample from BH09 due to low water volumes and heavy sediment, borehole was pumped and bailed to try to obtain a sample.

Field Record Sheet

Surface Water Sampling Field Record Sheet

RECEIVED: 19/09/2024

Date:	25 April 2024	**Time:**	8.30– 16.00 on site	**Location:**	Mounthall, Co. Laois
Staff:	Mairéad Brown			**SLR Project No.:**	501.065477.00001
Equipment	Aquatroll, Scoop				

Table 1 – Visual Field Parameters

Parameter	SW1	SW2	SW3
Odour	No	No	No
Sheen	No	No	No
Silt	No silt	No silt	No silt
Colour	Slightly yellow/ Transparent	Clear/Transparent	Clear/ Transparent
Free product	No	No	No

Table 2 – Aquatroll Field Parameters

Parameter	SW1	SW2	SW3
Temperature (°C)	8.73	9.47	9.19
Specific conductivity (µS/cm)	120.88	144.14	348.05
Salinity (PSU)	0.06	0.07	0.17
pH	7.69	7.81	7.88
Total Dissolved Solids (ppt)	0.08	0.09	0.23
Turbidity (NTU)	0.37	0.11	0.97
RDO Concentration (mg/L)	11.37	11.40	11.14

Other field observations:

Field Record Sheet

SLR

RECEIVED: 19/09/2024

Groundwater Sampling Field Record Sheet

Date:	19 June 2024	**Time:**	8.30 – 16.00 on site	**Location:**	Mounthall, Co. Laois
Staff:	Mairéad Brown, Michelle Sherry			**SLR Project No.:**	501.065477.00001
Equipment	Dip meter, Aquatroll, Watterra, Scoop				

Table 1- Water Measurements

	BH01	BH02	BH03	BH04	BH05	BH06	BH07	BH08	BH09
Groundwater level (m bgl)	8.08	19.13	6.77	13.65	6.38	1.09	2.58	21.21	Dry
Total depth (m)	11.19	22.93	11.3	24.9	15.45	3.13	6.21	22.87	23.1
Volume of water in borehole (litres)	17.11	20.9	24.92	61.88	49.89	11.22	19.97	9.13	-
Volume purged (L)	30	37.5	112.5	75	60	15	27.27	45	-
Waterra / Bailer	Waterra	Waterra	Waterra	Waterra	Waterra	Bailer	Waterra	Waterra	-

Table 2 – Visual field parameters

Parameter	BH01	BH02	BH03	BH04	BH05	BH06	BH07	BH08	BH09
Odour	No	No	No	No	No	No	No	No	-
Sheen	No	No	No	No	No	No	No	No	-
Silt	V. High	Medium	High	V. High	V. High	V. High	Low	V. High	-
Colour	Brown/ orange, opaque	Brown/ orange, opaque	Brown/ orange, opaque	Brown/ orange, opaque	Brown/ orange, opaque	Light milky brown, opaque	Brown/ orange, opaque	Brown/ orange, opaque	-
Free product	No	No	No	No	No	No	No	No	-

Table 3 – Aquatroll Field Parameters

Field Record Sheet

RECEIVED: 19/09/2024

Parameter	BH01	BH02	BH03	BH04	BH05	BH06	BH07	BH08	BH09
Temperature (°C)	10.75	10.5	10.47	10.56	10.48	11.94	11.18	10.61	-
Specific conductivity (µS/cm)	159.4	455.93	546.46	497.06	347.80	752.41	613.70	477.7	-
Salinity (PSU)	0.07	0.22	0.26	0.24	0.17	0.37	0.3	0.23	-
pH	5.25	6.56	6.52	6.17	6.34	7.86	6.3	6.70	-
Total Dissolved Solids (ppt)	0.1	0.3	0.36	0.32	0.23	0.49	0.4	0.31	-
Turbidity (NTU)	5364.19	6132.41	2196.22	1964.92	4080.35	5308.41	5739.31	6522.82	-
RDO Concentration (mg/L)	7.83	9.65	9.3	6.25	5.46	5.35	0.7	9.87	-

Other field observations:

BH03 – Pump refuelled >10m away.

BH09 – Unable to get a sample from BH09 due to low water volumes and heavy sediment, borehole was pumped and bailed to try to obtain a sample.

Field Record Sheet

SLR

Surface Water Sampling Field Record Sheet

RECEIVED: 19/09/2024

Date:	19 June 2024	**Time:**	8.30– 16.00 on site	**Location:**	Mounthall, Co. Laois
Staff:	Mairéad Brown, Michelle Sherry			**SLR Project No.:**	501.065477.00001
Equipment	Aquatroll, Scoop				

Table 1 – Visual Field Parameters

Parameter	SW1	SW2	SW3
Odour	No	No	No
Sheen	No	No	No
Silt	No silt	No silt	No silt
Colour	Slightly yellow/ Transparent	Slightly yellow /Transparent	Clear/ Transparent
Free product	No	No	No

Table 2 – Aquatroll Field Parameters

Parameter	SW1	SW2	SW3
Temperature (°C)	9.94	11.7	-
Specific conductivity (µS/cm)	144.94	159.24	-
Salinity (PSU)	0.08	0.08	-
pH	6.9	7.24	-
Total Dissolved Solids (ppt)	0.09	0.1	-
Turbidity (NTU)	2.9	0.23	-
RDO Concentration (mg/L)	11.16	10.81	-

Other field observations:

SW3 - Cows have access to stream and use it as drinking water.

SW3 - No Aquatroll data as it was being used for BH06 during purging.

Field Record Sheet

SLR

RECEIVED: 19/09/2024

Groundwater Sampling Field Record Sheet

Date:	9 July 2024	**Time:**	8.30 – 16.00 on site	**Location:**	Mounthall, Co. Laois
Staff:	Michelle Sherry			**SLR Project No.:**	501.065477.00001
Equipment	Dip meter, Aquatroll, Watterra, Scoop				

Table 1- Water Measurements

	BH01	BH02	BH03	BH04	BH05	BH06	BH07	BH08	BH09
Groundwater level (m bgl)	8.68	18.01	6.61	13.95	6.83	1.29	2.84	Dry	Dry
Total depth (m)	11.19	22.93	11.3	24.9	15.45	3.13	6.21	22.87	23.1
Volume of water in borehole (litres)	13.81	27.06	25.8	60.23	47.41	10.12	18.54	-	-
Volume purged (L)	150	112.5	75	100	37.5	25	112.5	-	-
Waterra / Bailer	Waterra	Waterra	Waterra	Waterra	Waterra	Bailer	Waterra	-	-

Table 2 – Visual field parameters

Parameter	BH01	BH02	BH03	BH04	BH05	BH06	BH07	BH08	BH09
Odour	No	No	No	No	No	No	No	-	-
Sheen	No	No	No	No	No	No	Slight hydrocarbon sheen	-	-
Silt	Medium silt	Medium silt	Medium silt	Very high silt	Very high silt	Very high silt	Very high silt	-	-
Colour	Brown	Light brown	Brown	Brown	Brown	Light brown/ cream	Brown	-	-
Free product	No	No	No	No	No	No	No	-	-

RECEIVED: 19/09/2024

Table 3 – Aquatroll Field Parameters

Parameter	BH01	BH02	BH03	BH04	BH05	BH06	BH07	BH08	BH09
Temperature (°C)	12.65	10.65	10.59	10.62	10.5	12.55	11.36	-	-
Specific conductivity (µS/cm)	161.1	434.26	559.04	493.5	320.28	673.75	631.19	-	-
Salinity (PSU)	0.08	0.21	0.27	0.24	0.15	0.33	0.31	-	-
pH	6.23	7.36	7.05	6.1	6,91	7.92	6.01	-	-
Total Dissolved Solids (ppt)	0.1	0.28	0.36	0.32	0.21	0.44	0.41	-	-
Turbidity (NTU)	1090.77	3613.71	2635.94	3381.5	3047.71	5206.36	1174.78	-	-
RDO Concentration (mg/L)	8.84	9.52	9.23	6.13	5.81	5.77	0.62	-	-

Other field observations:
BH05 – Pump refuelled >10m away.

BH07 – Pump refuelled >10m away.

BH08 – Pump refuelled >10m away.

BH08 – Unable to get a sample from BH09 due to low water volumes and heavy sediment, borehole was pumped and bailed to try to obtain a sample.

BH09 – Unable to get a sample from BH09 due to low water volumes and heavy sediment, borehole was pumped and bailed to try to obtain a sample.

Field Record Sheet

Surface Water Sampling Field Record Sheet

RECEIVED: 19/09/2024

Date:	10 July 2024	**Time:**	8.30– 16.00 on site	**Location:**	Mounthall, Co. Laois
Staff:	Michelle Sherry			**SLR Project No.:**	501.065477.00001
Equipment	Aquatroll, Scoop				

Table 1 – Visual Field Parameters

Parameter	SW1	SW2	SW3
Odour	No	No	No
Sheen	No	No	No
Silt	No	No	No
Colour	Light yellow	Dark yellow	Clear
Free product	No	No	No

Table 2 – Aquatroll Field Parameters

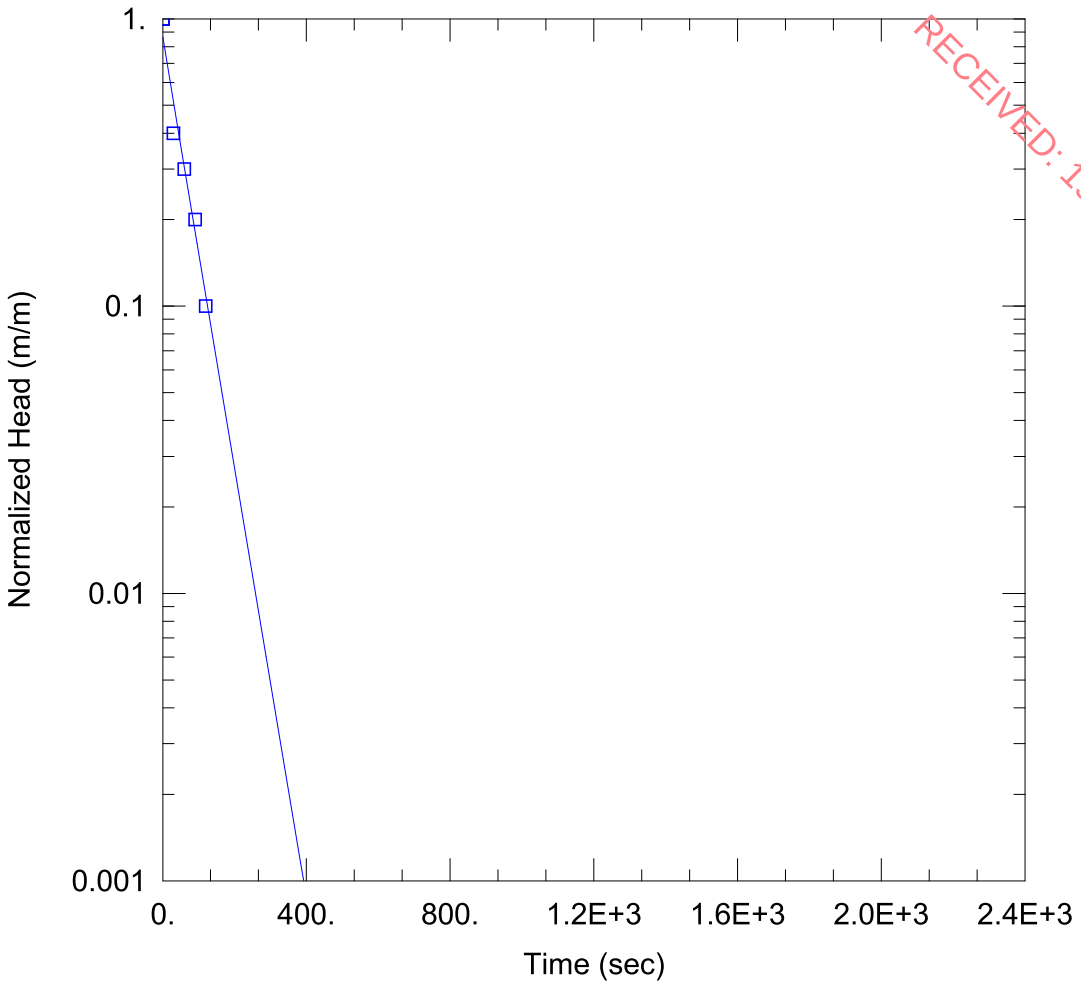
Parameter	SW1	SW2	SW3
Temperature (°C)	11.46	11.15	11.32
Specific conductivity (µS/cm)	49.42	46.95	342.82
Salinity (PSU)	0.02	0.02	0.16
pH	6.99	6.79	8.17
Total Dissolved Solids (ppt)	0.03	0.03	0.22
Turbidity (NTU)	11.06	9.56	0.54
RDO Concentration (mg/L)	10.82	10.86	10.59

Other field observations:

SW1 & SW2 – River level and flow was notably higher and faster than last sample collection.
SW3 - Cows have access to stream and use it as drinking water.

RECEIVED: 19/09/2024

Appendix 7-E
Rising Head Test Data



RECEIVED: 19/09/2024

INITIAL GROUNDWATER INVESTIGATION

Data Set: C:\...\Slug tests_Mounthall_BH2.aqt
Date: 05/17/24 Time: 13:43:33

PROJECT INFORMATION

Company: SLR Consulting Ltd
Client: Lagan Materials Ltd
Project: 501.065477.0001
Location: Mounthall
Test Well: BH2
Test Date: 15/04/20242

AQUIFER DATA

Saturated Thickness: 18.8 m Anisotropy Ratio (Kz/Kr): 1.

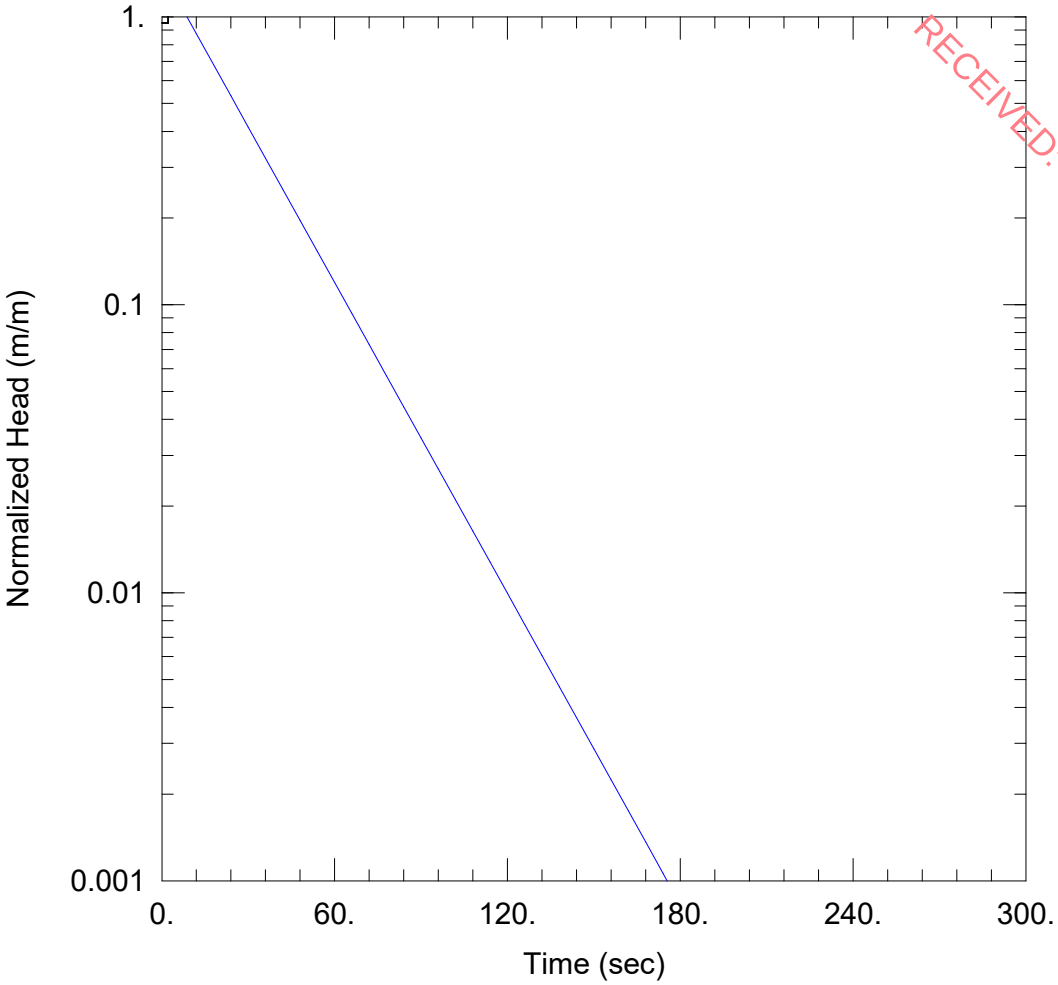
WELL DATA (BH2)

Initial Displacement: 0.1 m Static Water Column Height: 1.4 m
Total Well Penetration Depth: 23. m Screen Length: 20. m
Casing Radius: 0.025 m Well Radius: 0.025 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 1.518E-6 m/sec y0 = 0.08635 m



RECEIVED: 19/09/2024

INITIAL GROUNDWATER INVESTIGATION

Data Set: C:\...\Slug tests_Mounthall_BH3.aqt
Date: 05/17/24 Time: 13:42:33

PROJECT INFORMATION

Company: SLR Consulting Ltd
Client: Lagan Materials Ltd
Project: 501.065477.0001
Location: Mounthall
Test Well: BH3
Test Date: 15/04/20242

AQUIFER DATA

Saturated Thickness: 18.8 m Anisotropy Ratio (Kz/Kr): 1.

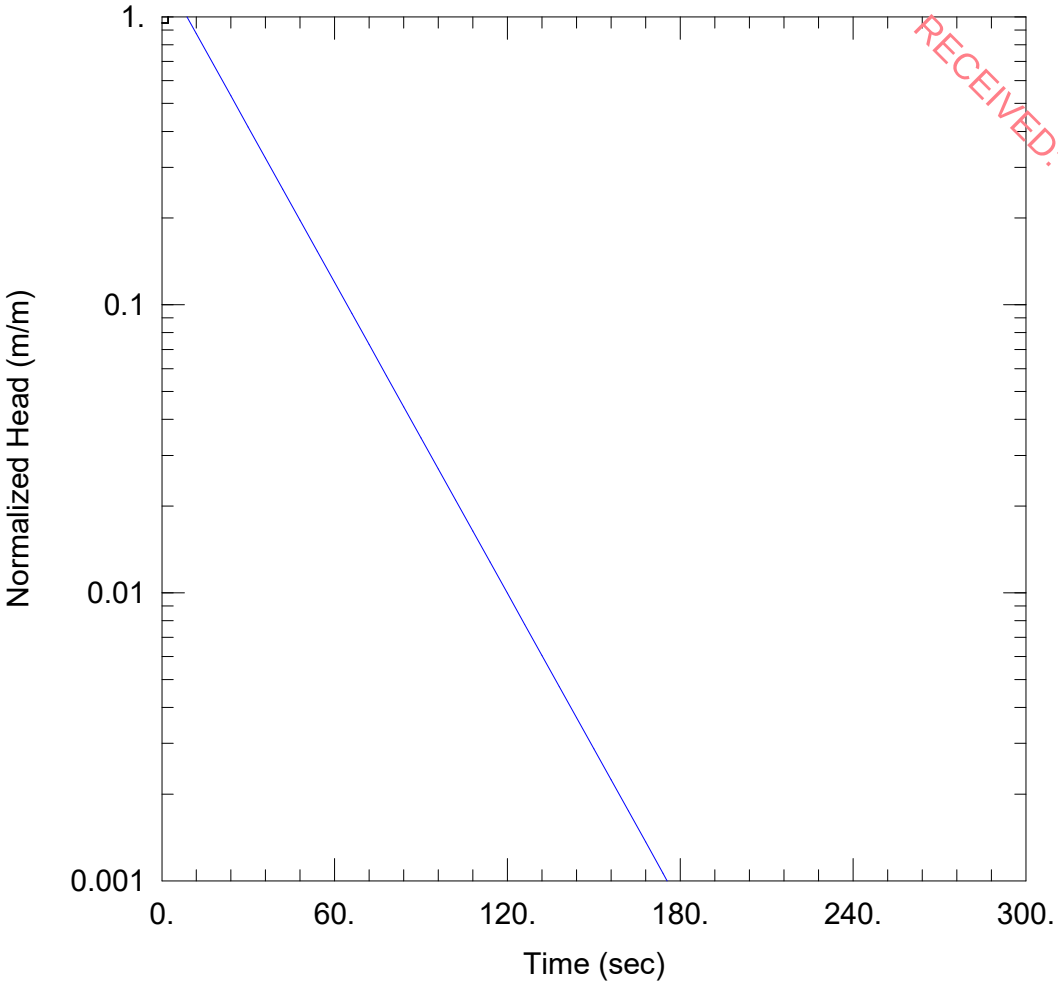
WELL DATA (BH3)

Initial Displacement: 0.11 m Static Water Column Height: 13.31 m
Total Well Penetration Depth: 23. m Screen Length: 20. m
Casing Radius: 0.025 m Well Radius: 0.025 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 3.649E-6 m/sec y0 = 0.1581 m



RECEIVED: 19/09/2024

INITIAL GROUNDWATER INVESTIGATION

Data Set: C:\...\Slug tests_Mounthall_BH3.aqt
Date: 05/17/24 Time: 13:42:33

PROJECT INFORMATION

Company: SLR Consulting Ltd
Client: Lagan Materials Ltd
Project: 501.065477.0001
Location: Mounthall
Test Well: BH3
Test Date: 15/04/20242

AQUIFER DATA

Saturated Thickness: 18.8 m Anisotropy Ratio (Kz/Kr): 1.

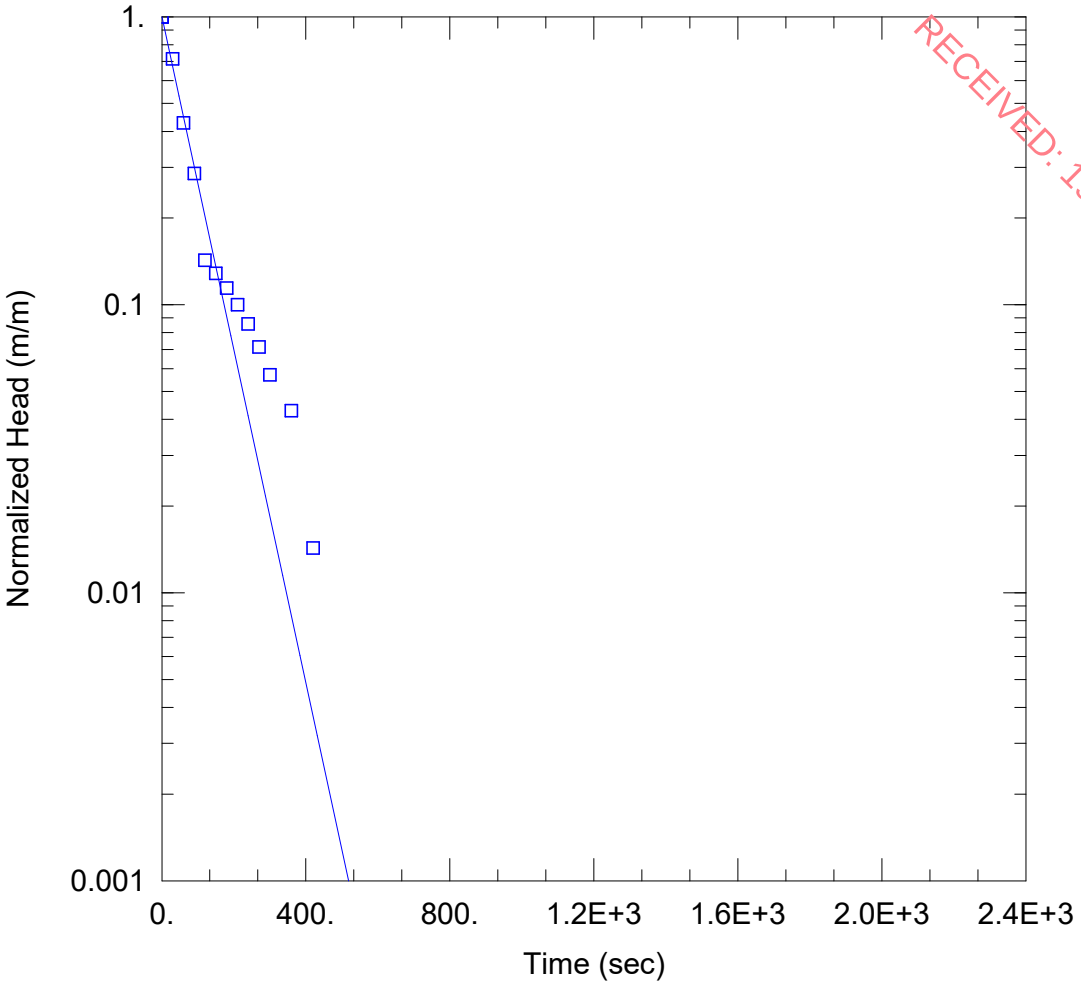
WELL DATA (BH3)

Initial Displacement: 0.11 m Static Water Column Height: 13.31 m
Total Well Penetration Depth: 23. m Screen Length: 20. m
Casing Radius: 0.025 m Well Radius: 0.025 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 3.649E-6 m/sec y0 = 0.1581 m



RECEIVED: 19/09/2024

INITIAL GROUNDWATER INVESTIGATION

Data Set: C:\...\Slug tests_Mounthall_BH4.aqt
Date: 05/24/24 Time: 15:40:38

PROJECT INFORMATION

Company: SLR Consulting Ltd
Client: Lagan Materials Ltd
Project: 501.065477.0001
Location: Mounthall
Test Well: BH4
Test Date: 15/04/20242

AQUIFER DATA

Saturated Thickness: 18.8 m Anisotropy Ratio (Kz/Kr): 1.

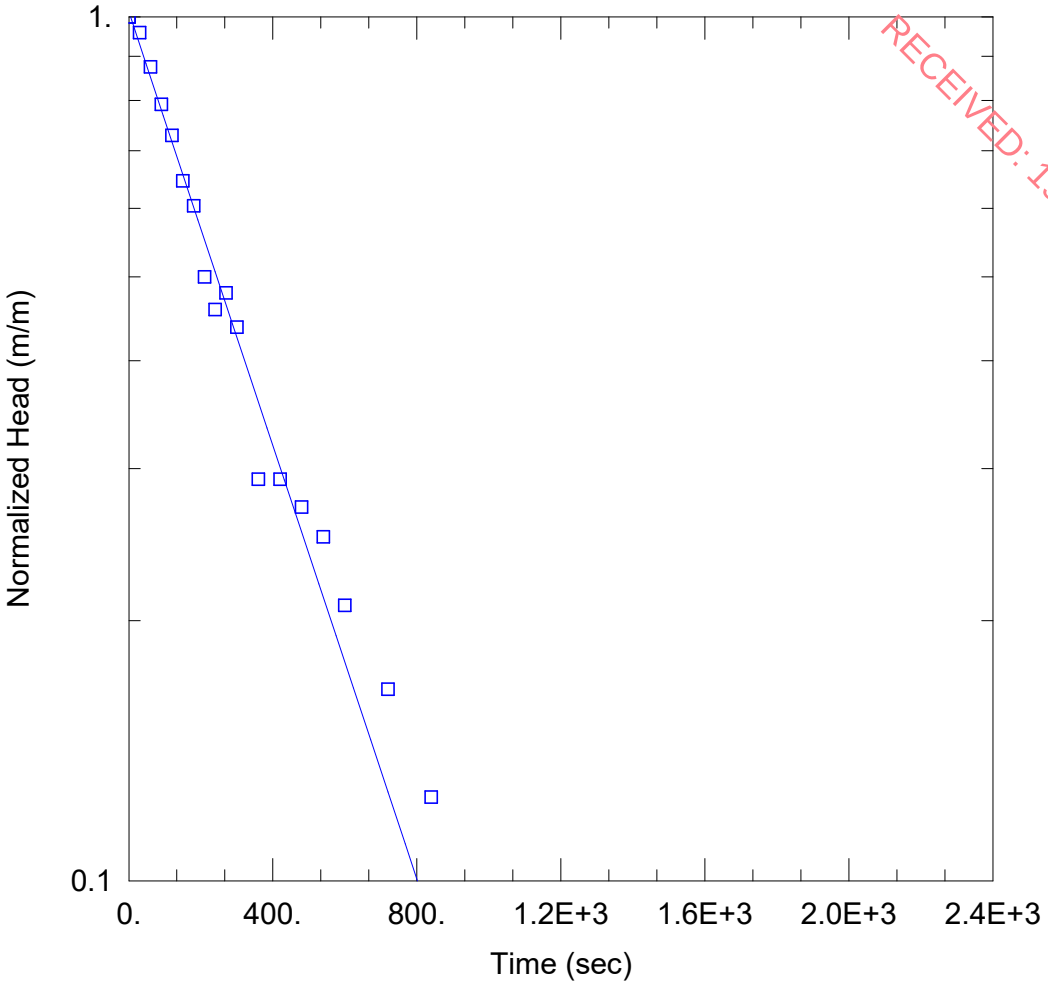
WELL DATA (BH4)

Initial Displacement: 0.07 m Static Water Column Height: 8.25 m
Total Well Penetration Depth: 25. m Screen Length: 11.5 m
Casing Radius: 0.025 m Well Radius: 0.025 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 2.469E-6 m/sec y0 = 0.0704 m



RECEIVED: 19/09/2024

INITIAL GROUNDWATER INVESTIGATION

Data Set: C:\...\Slug tests_Mounthall_BH5.aqt
Date: 05/24/24 Time: 15:41:08

PROJECT INFORMATION

Company: SLR Consulting Ltd
Client: Lagan Materials Ltd
Project: 501.065477.0001
Location: Mounthall
Test Well: BH5
Test Date: 15/04/20242

AQUIFER DATA

Saturated Thickness: 18.8 m Anisotropy Ratio (Kz/Kr): 1.

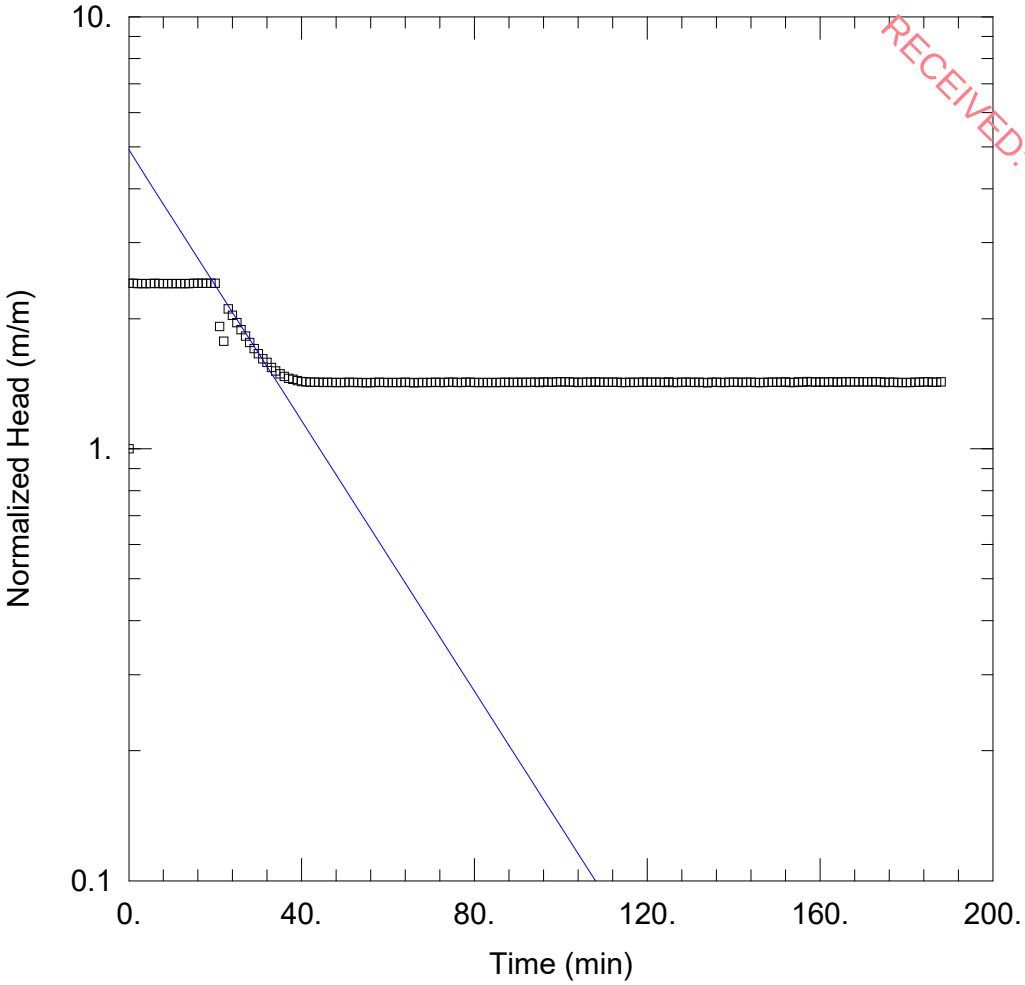
WELL DATA (BH5)

Initial Displacement: 0.24 m Static Water Column Height: 15.94 m
Total Well Penetration Depth: 15. m Screen Length: 6.5 m
Casing Radius: 0.025 m Well Radius: 0.025 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 7.719E-7 m/sec y0 = 0.2432 m



RECEIVED: 19/09/2024

WELL TEST ANALYSIS

Data Set: C:\...\Mounthall pumping tests_July.aqt
Date: 08/13/24 Time: 15:53:21

PROJECT INFORMATION

Company: SLR Consulting Ltd
Client: Lagan Materials Ltd
Project: 501.065477.0001
Location: Mounthall
Test Well: BH6
Test Date: 01/07/2024

AQUIFER DATA

Saturated Thickness: 4. m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH6)

Initial Displacement: 1.104 m
Static Water Column Height: 1.566 m
Total Well Penetration Depth: 8. m
Screen Length: 4. m
Casing Radius: 0.0225 m
Well Radius: 0.08 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 5.315E-7 m/min
y0 = 5.429 m

RECEIVED: 19/09/2024

Appendix 7-F
Surface Water and Groundwater Laboratory Results

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

RECEIVED: 19/09/2024

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

Attention: Mairead Brown

CERTIFICATE OF ANALYSIS

Date of report Generation:	12 May 2024
Customer:	SLR Consulting Ireland
Sample Delivery Group (SDG):	240430-69
Your Reference:	501.065477.0001
Location:	Mounthall, Co. Laois
Report No:	728374
Order Number:	1200

We received 8 samples on Tuesday April 30, 2024 and 8 of these samples were scheduled for analysis which was completed on Sunday May 12, 2024. 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

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
29727199	2023BH01		0.00 - 0.00	24/04/2024
29727213	2023BH02		0.00 - 0.00	24/04/2024
29727223	2023BH03		0.00 - 0.00	25/04/2024
29727239	2023BH04		0.00 - 0.00	25/04/2024
29727247	2023BH05		0.00 - 0.00	25/04/2024
29727255	2024BH03		0.00 - 0.00	24/04/2024
29727231	2024BH06		0.00 - 0.00	24/04/2024
29727264	2024BH08		0.00 - 0.00	24/04/2024

RECEIVED: 19/09/2024

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

Validated

CERTIFICATE OF ANALYSIS

SDG: 240430-69 **Report Number:** 728374 **Superseded Report:**
Client Ref.: 501.065477.0001 **Location:** Mounthall, Co. Laois

Results Legend

X Test

N No Determination Possible

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

RECEIVED: 19/09/2024

Lab Sample No(s)			29727199					29727213					29727223					29727239			
Customer Sample Reference			2023BH01					2023BH02					2023BH03					2023BH04			
AGS Reference																					
Depth (m)			0.00 - 0.00					0.00 - 0.00					0.00 - 0.00					0.00 - 0.00			
Container			0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)
Sample Type			GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 8			X					X					X					X	
Anions by Kone (w)	All	NDPs: 0 Tests: 8		X					X					X					X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 8				X					X					X					X
EPH and CWG by FID	All	NDPs: 0 Tests: 8	X					X					X					X			
Fluoride	All	NDPs: 0 Tests: 8		X					X					X					X		
GRO by GC-FID (W)	All	NDPs: 0 Tests: 8					X					X					X				
Mercury Dissolved	All	NDPs: 0 Tests: 8				X					X					X					X
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 8	X					X						X				X			
pH Value	All	NDPs: 0 Tests: 8		X					X					X					X		
Phosphate by Kone (w)	All	NDPs: 0 Tests: 8		X					X					X					X		
TPH CWG (W)	All	NDPs: 0 Tests: 8	X					X					X					X			
VOC MS (W)	All	NDPs: 0 Tests: 8					X					X					X				

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29727264	2024BH08		0.00 - 0.00	Vial (ALE297)	GW						X						X
				HNO3 Filtered (ALE204)	GW			X				X					
				H2SO4 (ALE244)	GW	X											
				500ml Plastic (ALE208)	GW		X			X				X	X		
				0.5l glass bottle (ALE227)	GW				X				X			X	
29727231	2024BH06		0.00 - 0.00	Vial (ALE297)	GW						X						X
				HNO3 Filtered (ALE204)	GW			X				X					
				H2SO4 (ALE244)	GW	X											
				500ml Plastic (ALE208)	GW		X			X				X	X		
				0.5l glass bottle (ALE227)	GW				X				X			X	
29727255	2024BH03		0.00 - 0.00	Vial (ALE297)	GW						X						X
				HNO3 Filtered (ALE204)	GW			X				X					
				H2SO4 (ALE244)	GW	X											
				500ml Plastic (ALE208)	GW		X			X				X	X		
				0.5l glass bottle (ALE227)	GW				X				X			X	
29727247	2023BH05		0.00 - 0.00	Vial (ALE297)	GW						X						X
				HNO3 Filtered (ALE204)	GW			X				X					
				H2SO4 (ALE244)	GW	X											
				500ml Plastic (ALE208)	GW		X			X				X	X		
				0.5l glass bottle (ALE227)	GW				X				X			X	
29727239	2023BH04		0.00 - 0.00	Vial (ALE297)	GW						X						X

Validated

CERTIFICATE OF ANALYSIS

SDG: 240430-69 **Report Number:** 728374 **Superseded Report:**
Client Ref.: 501.065477.0001 **Location:** Mounthall, Co. Laois

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

Customer Sample Ref.			2023BH01	2023BH02	2023BH03	2023BH04	2023BH05	2024BH03
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
Sample Type			Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
Date Sampled			24/04/2024	24/04/2024	25/04/2024	25/04/2024	25/04/2024	24/04/2024
Sample Time			-	-	-	-	-	-
Date Received			30/04/2024	30/04/2024	30/04/2024	30/04/2024	30/04/2024	30/04/2024
SDG Ref			240430-69	240430-69	240430-69	240430-69	240430-69	240430-69
Lab Sample No.(s)			29727199	29727213	29727223	29727239	29727247	29727255
AGS Reference								
Component	**LOD/Units**	**Method**						
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2 #	<0.2 #	<0.2 #	<0.2 #	<0.2 #	<0.2 #
Ammoniacal Nitrogen as NH3	<0.2 mg/l	TM099	<0.2 #	<0.2 #	<0.2 #	<0.2 #	<0.2 #	<0.2 #
Fluoride	<0.5 mg/l	TM104	<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #
Aluminium (diss.filt)	<10 µg/l	TM152	<10 #	<10 #	<10 #	<60 #	<10 #	<10 #
Arsenic (diss.filt)	<0.5 µg/l	TM152	<0.5 #	<0.5 #	<0.5 #	<3 #	<0.5 #	<0.5 #
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08 #	<0.08 #	<0.08 #	<0.08 #	<0.08 #	<0.08 #
Chromium (diss.filt)	<1 µg/l	TM152	<1 #	<1 #	<1 #	<6 #	<1 #	<1 #
Copper (diss.filt)	<0.3 µg/l	TM152	<0.3 #	<0.3 #	<0.3 #	<1.8 #	<0.3 #	1.29 #
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2 #	<0.2 #	<0.2 #	<1.2 #	0.394 #	<0.2 #
Nickel (diss.filt)	<0.4 µg/l	TM152	0.494 #	<0.4 #	0.53 #	<2.4 #	0.777 #	1.38 #
Zinc (diss.filt)	<1 µg/l	TM152	2.75 #	1.64 #	1.64 #	<6 #	1.74 #	5.5 #
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	1.29 #	2.4 #	2.12 #	3.12 #	2 #	6.59 #
Iron (Dis.Filt)	<0.019 mg/l	TM152	<0.019 #	<0.019 #	<0.019 #	<0.114 #	0.0315 #	<0.019 #
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Sulphate	<2 mg/l	TM184	<2 #	2.7 #	<2 #	4.2 #	3.8 #	5.1 #
Chloride	<2 mg/l	TM184	3.9 #	7.9 #	4.9 #	12.1 #	9.5 #	5.8 #
Nitrate as NO3	<0.3 mg/l	TM184	2.9 #	4.61 #	5.34 #	10.6 #	2.97 #	1.01 #
pH	<1 pH Units	TM256	6.45 #	7.77 #	7.61 #	7.32 #	7.66 #	7.25 #
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256	0.157 #	0.399 #	0.443 #	0.463 #	0.364 #	0.485 #

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CERTIFICATE OF ANALYSIS

SDG: 240430-69 **Report Number:** 728374 **Superseded Report:**
Client Ref.: 501.065477.0001 **Location:** Mounthall, Co. Laois

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

Component	LOD/Units	Method	2024BH06	2024BH08				
Customer Sample Ref.			2024BH06	2024BH08				
Depth (m)			0.00 - 0.00	0.00 - 0.00				
Sample Type			Ground Water (GW)	Ground Water (GW)				
Date Sampled			24/04/2024	24/04/2024				
Sample Time			-	-				
Date Received			30/04/2024	30/04/2024				
SDG Ref			240430-69	240430-69				
Lab Sample No.(s)			29727231	29727264				
AGS Reference								
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2 #	<0.2 #				
Ammoniacal Nitrogen as NH3	<0.2 mg/l	TM099	<0.2 #	<0.2 #				
Fluoride	<0.5 mg/l	TM104	<0.5 #	<0.5 #				
Aluminium (diss.filt)	<10 µg/l	TM152	<10 #	<10 #				
Arsenic (diss.filt)	<0.5 µg/l	TM152	<0.5 #	<0.5 #				
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08 #	<0.08 #				
Chromium (diss.filt)	<1 µg/l	TM152	<1 #	<1 #				
Copper (diss.filt)	<0.3 µg/l	TM152	1.27 #	0.672 #				
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2 #	<0.2 #				
Nickel (diss.filt)	<0.4 µg/l	TM152	0.88 #	<0.4 #				
Zinc (diss.filt)	<1 µg/l	TM152	5.87 #	3.05 #				
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	2.62 #	3.68 #				
Iron (Dis.Filt)	<0.019 mg/l	TM152	<0.019 #	<0.019 #				
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01 #	<0.01 #				
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184	<0.05 #	<0.05 #				
Sulphate	<2 mg/l	TM184	2.1 #	3.5 #				
Chloride	<2 mg/l	TM184	8.8 #	7 #				
Nitrate as NO3	<0.3 mg/l	TM184	8.65 #	7.02 #				
pH	<1 pH Units	TM256	7.21 #	7.69 #				
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256	0.31 #	0.418 #				

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CERTIFICATE OF ANALYSIS

SDG: 240430-69 **Report Number:** 728374 **Superseded Report:**
Client Ref.: 501.065477.0001 **Location:** Mounthall, Co. Laois

PAH Spec MS - Aqueous (W)

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

Customer Sample Ref.			2023BH01	2023BH02	2023BH03	2023BH04	2023BH05	2024BH03
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
Sample Type			Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
Date Sampled			24/04/2024	24/04/2024	25/04/2024	25/04/2024	25/04/2024	24/04/2024
Sample Time			.	.	.	.	.	.
Date Received			30/04/2024	30/04/2024	30/04/2024	30/04/2024	30/04/2024	30/04/2024
SDG Ref			240430-69	240430-69	240430-69	240430-69	240430-69	240430-69
Lab Sample No.(s)			29727199	29727213	29727223	29727239	29727247	29727255
AGS Reference								
Component	**LOD/Units**	**Method**						
Naphthalene (aq)	<0.01 µg/l	TM178	<0.01 #	<0.01 #	1.39 @ #	<0.1 #	<0.01 #	0.0131 #
Acenaphthene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.05 @ #	<0.05 #	<0.005 #	<0.005 #
Acenaphthylene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.05 @ #	<0.05 #	<0.005 #	<0.005 #
Fluoranthene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.05 @ #	<0.05 #	<0.005 #	<0.005 #
Anthracene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.05 @ #	<0.05 #	<0.005 #	<0.005 #
Phenanthrene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.05 @ #	<0.05 #	<0.005 #	<0.005 #
Fluorene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.05 @ #	<0.05 #	<0.005 #	<0.005 #
Chrysene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.05 @ #	<0.05 #	<0.005 #	<0.005 #
Pyrene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.05 @ #	<0.05 #	<0.005 #	<0.005 #
Benzo(a)anthracene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.05 @ #	<0.05 #	<0.005 #	<0.005 #
Benzo(b)fluoranthene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.05 @ #	<0.05 #	<0.005 #	<0.005 #
Benzo(k)fluoranthene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.05 @ #	<0.05 #	<0.005 #	<0.005 #
Benzo(a)pyrene (aq)	<0.002 µg/l	TM178	<0.002 #	<0.002 #	<0.02 @ #	<0.02 #	<0.002 #	<0.002 #
Dibenzo(a,h)anthracene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.05 @ #	<0.05 #	<0.005 #	<0.005 #
Benzo(g,h,i)perylene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.05 @ #	<0.05 #	<0.005 #	<0.005 #
Indeno(1,2,3-cd)pyrene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.05 @ #	<0.05 #	<0.005 #	<0.005 #
PAH, Total Detected USEPA 16 (aq)	<0.082 µg/l	TM178	<0.082 #	<0.082 #	1.39 @ #	<0.82 #	<0.082 #	<0.082 #

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CERTIFICATE OF ANALYSIS

SDG: 240430-69 **Report Number:** 728374 **Superseded Report:**
Client Ref.: 501.065477.0001 **Location:** Mounthall, Co. Laois

PAH Spec MS - Aqueous (W)

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

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Customer Sample Ref.			2024BH06	2024BH08				
Depth (m)			0.00 - 0.00	0.00 - 0.00				
Sample Type			Ground Water (GW)	Ground Water (GW)				
Date Sampled			24/04/2024	24/04/2024				
Sample Time			.	.				
Date Received			30/04/2024	30/04/2024				
SDG Ref			240430-69	240430-69				
Lab Sample No.(s)			29727231	29727264				
AGS Reference								
Component	**LOD/Units**	**Method**						
Naphthalene (aq)	<0.01 µg/l	TM178	<0.1 #	<0.1 #				
Acenaphthene (aq)	<0.005 µg/l	TM178	<0.05 #	<0.05 #				
Acenaphthylene (aq)	<0.005 µg/l	TM178	<0.05 #	<0.05 #				
Fluoranthene (aq)	<0.005 µg/l	TM178	<0.05 #	<0.05 #				
Anthracene (aq)	<0.005 µg/l	TM178	<0.05 #	<0.05 #				
Phenanthrene (aq)	<0.005 µg/l	TM178	<0.05 #	<0.05 #				
Fluorene (aq)	<0.005 µg/l	TM178	<0.05 #	<0.05 #				
Chrysene (aq)	<0.005 µg/l	TM178	<0.05 #	<0.05 #				
Pyrene (aq)	<0.005 µg/l	TM178	<0.05 #	<0.05 #				
Benzo(a)anthracene (aq)	<0.005 µg/l	TM178	<0.05 #	<0.05 #				
Benzo(b)fluoranthene (aq)	<0.005 µg/l	TM178	<0.05 #	<0.05 #				
Benzo(k)fluoranthene (aq)	<0.005 µg/l	TM178	<0.05 #	<0.05 #				
Benzo(a)pyrene (aq)	<0.002 µg/l	TM178	<0.02 #	<0.02 #				
Dibenzo(a,h)anthracene (aq)	<0.005 µg/l	TM178	<0.05 #	<0.05 #				
Benzo(g,h,i)perylene (aq)	<0.005 µg/l	TM178	<0.05 #	<0.05 #				
Indeno(1,2,3-cd)pyrene (aq)	<0.005 µg/l	TM178	<0.05 #	<0.05 #				
PAH, Total Detected USEPA 16 (aq)	<0.082 µg/l	TM178	<0.82 #	<0.82 #				

Validated

CERTIFICATE OF ANALYSIS

SDG: 240430-69 **Report Number:** 728374 **Superseded Report:**
Client Ref.: 501.065477.0001 **Location:** Mounthall, Co. Laois

TPH CWG (W)

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

Customer Sample Ref.			2023BH01	2023BH02	2023BH03	2023BH04	2023BH05	2024BH03
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
Sample Type			Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
Date Sampled			24/04/2024	24/04/2024	25/04/2024	25/04/2024	25/04/2024	24/04/2024
Sample Time			-	-	-	-	-	-
Date Received			30/04/2024	30/04/2024	30/04/2024	30/04/2024	30/04/2024	30/04/2024
SDG Ref			240430-69	240430-69	240430-69	240430-69	240430-69	240430-69
Lab Sample No.(s)			29727199	29727213	29727223	29727239	29727247	29727255
AGS Reference								
Component	**LOD/Units**	**Method**						
GRO Surrogate % recovery**	%	TM245	103	104	104	104	101	102
GRO >C5-C12 (HS_1D_TOTAL)	<50 µg/l	TM245	<50 #	<50 #	<50 #	<50 #	<50 #	<50 #
Aliphatics >C5-C6 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aliphatics >C6-C8 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aliphatics >C8-C10 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aliphatics >C10-C12 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aliphatics >C12-C16 (aq) (SPECD_AL1_W)	<10 µg/l	TM439	<10	<50	<100	<100	<100	<100
Aliphatics >C16-C21 (aq) (SPECD_AL2_W)	<10 µg/l	TM439	<10	<50	<100	<100	<100	<100
Aliphatics >C21-C35 (aq) (SPECD_AL3_W)	<10 µg/l	TM439	<10	<50	<100	<100	<100	<100
Total Aliphatics >C12-C35 (aq) (EPHAL12_35T_GC_W)	<10 µg/l	TM439	<10	<50	<100	<100	<100	<100
Aromatics >EC5-EC7 (HS_1D_AR)	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aromatics >EC7-EC8 (HS_1D_AR)	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aromatics >EC8-EC10	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aromatics >EC10-EC12	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aromatics >EC12-EC16 (aq) (SPECD_AROM1_W)	<10 µg/l	TM439	<10	<50	<100	<100	<100	<100
Aromatics >EC16-EC21 (aq) (SPECD_AROM2_W)	<10 µg/l	TM439	<10	<50	<100	<100	<100	<100
Aromatics >EC21-EC35 (aq) (SPECD_AROM3_W)	<10 µg/l	TM439	<10	<50	<100	<100	<100	<100
Total Aromatics >EC12-EC35 (aq) (EPHAR12_35T_GC_W)	<10 µg/l	TM439	<10	<50	<100	<100	<100	<100
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM439	<10	<10	<10	<10	<10	<10

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CERTIFICATE OF ANALYSIS

SDG: 240430-69 **Report Number:** 728374 **Superseded Report:**
Client Ref.: 501.065477.0001 **Location:** Mounthall, Co. Laois

TPH CWG (W)

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

Customer Sample Ref.			2024BH06	2024BH08				
Depth (m)			0.00 - 0.00	0.00 - 0.00				
Sample Type			Ground Water (GW)	Ground Water (GW)				
Date Sampled			24/04/2024	24/04/2024				
Sample Time			.	.				
Date Received			30/04/2024	30/04/2024				
SDG Ref			240430-69	240430-69				
Lab Sample No.(s)			29727231	29727264				
AGS Reference								
Component	**LOD/Units**	**Method**						
GRO Surrogate % recovery**	%	TM245	108	99				
GRO >C5-C12 (HS_1D_TOTAL)	<50 µg/l	TM245	<50 #	<50 #				
Aliphatics >C5-C6 (HS_1D_AL)	<10 µg/l	TM245	<10	<10				
Aliphatics >C6-C8 (HS_1D_AL)	<10 µg/l	TM245	<10	<10				
Aliphatics >C8-C10 (HS_1D_AL)	<10 µg/l	TM245	<10	<10				
Aliphatics >C10-C12 (HS_1D_AL)	<10 µg/l	TM245	<10	<10				
Aliphatics >C12-C16 (aq) (SPECD_AL1_W)	<10 µg/l	TM439	<10	<50				
Aliphatics >C16-C21 (aq) (SPECD_AL2_W)	<10 µg/l	TM439	<10	<50				
Aliphatics >C21-C35 (aq) (SPECD_AL3_W)	<10 µg/l	TM439	<10	424				
Total Aliphatics >C12-C35 (aq) (EPHAL12_35T_GC_W)	<10 µg/l	TM439	<10	424				
Aromatics >EC5-EC7 (HS_1D_AR)	<10 µg/l	TM245	<10	<10				
Aromatics >EC7-EC8 (HS_1D_AR)	<10 µg/l	TM245	<10	<10				
Aromatics >EC8-EC10	<10 µg/l	TM245	<10	<10				
Aromatics >EC10-EC12	<10 µg/l	TM245	<10	<10				
Aromatics >EC12-EC16 (aq) (SPECD_AROM1_W)	<10 µg/l	TM439	<10	<50				
Aromatics >EC16-EC21 (aq) (SPECD_AROM2_W)	<10 µg/l	TM439	<10	<50				
Aromatics >EC21-EC35 (aq) (SPECD_AROM3_W)	<10 µg/l	TM439	<10	2010				
Total Aromatics >EC12-EC35 (aq) (EPHAR12_35T_GC_W)	<10 µg/l	TM439	<10	2010				
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM439	<10	2430				

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CERTIFICATE OF ANALYSIS

SDG: 240430-69 **Report Number:** 728374 **Superseded Report:**
Client Ref.: 501.065477.0001 **Location:** Mounthall, Co. Laois

VOC MS (W)

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

Customer Sample Ref.			2023BH01	2023BH02	2023BH03	2023BH04	2023BH05	2024BH03
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
Sample Type			Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
Date Sampled			24/04/2024	24/04/2024	25/04/2024	25/04/2024	25/04/2024	24/04/2024
Sample Time			.	.	.	.	.	.
Date Received			30/04/2024	30/04/2024	30/04/2024	30/04/2024	30/04/2024	30/04/2024
SDG Ref			240430-69	240430-69	240430-69	240430-69	240430-69	240430-69
Lab Sample No.(s)			29727199	29727213	29727223	29727239	29727247	29727255
AGS Reference								
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 #
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 #	<1 #
o-Xylene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Sum of detected Xylenes	<2 µg/l	TM208	<2	<2	<2	<2	<2	<2
Sum of BTEX	<5 µg/l	TM208	<5	<5	<5	<5	<5	<5

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CERTIFICATE OF ANALYSIS

SDG: 240430-69 **Report Number:** 728374 **Superseded Report:**
Client Ref.: 501.065477.0001 **Location:** Mounthall, Co. Laois

VOC MS (W)

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

Customer Sample Ref.			2024BH06	2024BH08				
Depth (m)			0.00 - 0.00	0.00 - 0.00				
Sample Type			Ground Water (GW)	Ground Water (GW)				
Date Sampled			24/04/2024	24/04/2024				
Sample Time			.	.				
Date Received			30/04/2024	30/04/2024				
SDG Ref			240430-69	240430-69				
Lab Sample No.(s)			29727231	29727264				
AGS Reference								
Component	**LOD/Units**	**Method**						
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1 #	<1 #				
Benzene	<1 µg/l	TM208	<1 #	<1 #				
Toluene	<1 µg/l	TM208	<1 #	<1 #				
Ethylbenzene	<1 µg/l	TM208	<1 #	<1 #				
m,p-Xylene	<1 µg/l	TM208	<1 #	<1 #				
o-Xylene	<1 µg/l	TM208	<1 #	<1 #				
Sum of detected Xylenes	<2 µg/l	TM208	<2	<2				
Sum of BTEX	<5 µg/l	TM208	<5	<5				

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Table of Results - Appendix

Method No	Description
TM104	Determination of Fluoride using the Kone Analyser
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM245	Determination of GRO by Headspace in waters
TM152	Analysis of Aqueous Samples by ICP-MS
TM208	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM178	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM439	Determination of Extractable Petroleum Hydrocarbons (EPH) CWG banding by GC-FID on liquids
TM099	Determination of Ammonium in Water Samples using the Kone Analyser

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NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

Validated

CERTIFICATE OF ANALYSIS

SDG: 240430-69 **Report Number:** 728374 **Superseded Report:**
Client Ref.: 501.065477.0001 **Location:** Mounthall, Co. Laois

Test Completion Dates

Lab Sample No(s)	29727199	29727213	29727223	29727239	29727247	29727255	29727231	29727264
Customer Sample Ref.	2023BH01	2023BH02	2023BH03	2023BH04	2023BH05	2024BH03	2024BH06	2024BH08
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
Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Ammoniacal Nitrogen	03-May-2024	03-May-2024	03-May-2024	03-May-2024	03-May-2024	03-May-2024	03-May-2024	03-May-2024
Anions by Kone (w)	07-May-2024	07-May-2024	07-May-2024	07-May-2024	07-May-2024	07-May-2024	07-May-2024	01-May-2024
Dissolved Metals by ICP-MS	08-May-2024	08-May-2024	08-May-2024	08-May-2024	08-May-2024	08-May-2024	08-May-2024	08-May-2024
EPH and CWG by FID	02-May-2024	03-May-2024	03-May-2024	03-May-2024	03-May-2024	03-May-2024	02-May-2024	02-May-2024
Fluoride	02-May-2024	02-May-2024	02-May-2024	02-May-2024	02-May-2024	02-May-2024	02-May-2024	02-May-2024
GRO by GC-FID (W)	01-May-2024	01-May-2024	01-May-2024	01-May-2024	01-May-2024	01-May-2024	01-May-2024	01-May-2024
Mercury Dissolved	03-May-2024	03-May-2024	03-May-2024	03-May-2024	03-May-2024	03-May-2024	03-May-2024	03-May-2024
Nitrite by Kone (w)	07-May-2024	07-May-2024	07-May-2024	07-May-2024	07-May-2024	07-May-2024	01-May-2024	01-May-2024
PAH Spec MS - Aqueous (W)	03-May-2024	07-May-2024	12-May-2024	03-May-2024	07-May-2024	07-May-2024	03-May-2024	03-May-2024
pH Value	03-May-2024	03-May-2024	03-May-2024	03-May-2024	03-May-2024	03-May-2024	03-May-2024	03-May-2024
Phosphate by Kone (w)	02-May-2024	02-May-2024	02-May-2024	02-May-2024	02-May-2024	02-May-2024	01-May-2024	01-May-2024
TPH CWG (W)	02-May-2024	03-May-2024	03-May-2024	03-May-2024	03-May-2024	03-May-2024	02-May-2024	02-May-2024
VOC MS (W)	01-May-2024	01-May-2024	01-May-2024	01-May-2024	01-May-2024	01-May-2024	01-May-2024	01-May-2024

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Appendix

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

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

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19. **Sample Deviations**

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

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

20. **Asbestos**

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

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

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

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

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

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

Attention: Mairead Brown

CERTIFICATE OF ANALYSIS

Date of report Generation:	08 May 2024
Customer:	SLR Consulting Ireland
Sample Delivery Group (SDG):	240430-71
Your Reference:	501.065477.00001
Location:	Mounthall, Co.Laois
Report No:	728103
Order Number:	1201

We received 3 samples on Tuesday April 30, 2024 and 3 of these samples were scheduled for analysis which was completed on Wednesday May 08, 2024. 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

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
29727318	SW1		0.00 - 0.00	25/04/2024
29727335	SW2		0.00 - 0.00	25/04/2024
29727348	SW3		0.00 - 0.00	24/04/2024

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

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CERTIFICATE OF ANALYSIS

SDG: 240430-71 **Report Number:** 728103 **Superseded Report:**
Client Ref.: 501.065477.00001 **Location:** Mounthall, Co.Laois

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Results Legend

X Test

N No Determination Possible

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

Lab Sample No(s)			29727318							29727335							29727348						
Customer Sample Reference			SW1							SW2							SW3						
AGS Reference																							
Depth (m)			0.00 - 0.00							0.00 - 0.00							0.00 - 0.00						
Container			0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)
Sample Type			SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
Ammonium Low	All	NDPs: 0 Tests: 3				X							X							X	
Anions by Kone (w)	All	NDPs: 0 Tests: 3			X							X							X		
BOD True Total	All	NDPs: 0 Tests: 3		X							X							X			
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 3					X							X							X
EPH and CWG by FID	All	NDPs: 0 Tests: 3	X							X							X				
GRO by GC-FID (W)	All	NDPs: 0 Tests: 3							X							X					
Mercury Dissolved	All	NDPs: 0 Tests: 3					X							X							X
Nitrite by Kone (w)	All	NDPs: 0 Tests: 3						X							X						
pH Value	All	NDPs: 0 Tests: 3			X							X							X		
Phosphate by Kone (w)	All	NDPs: 0 Tests: 3			X							X							X		
Suspended Solids	All	NDPs: 0 Tests: 3			X							X							X		
TPH CWG (W)	All	NDPs: 0 Tests: 3	X							X							X				
VOC MS (W)	All	NDPs: 0 Tests: 3							X							X					

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29727348	SW3		0.00 - 0.00	Vial (ALE297)	NaOH (ALE245)
				SW	SW
				X	
					X
				X	

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Validated

CERTIFICATE OF ANALYSIS

SDG: 240430-71 **Report Number:** 728103 **Superseded Report:**
Client Ref.: 501.065477.00001 **Location:** Mounthall, Co.Laois

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

Customer Sample Ref.			SW1	SW2	SW3			
Depth (m)			0.00 - 0.00	0.00 - 0.00	0.00 - 0.00			
Sample Type			Surface Water (SW)	Surface Water (SW)	Surface Water (SW)			
Date Sampled			25/04/2024	25/04/2024	24/04/2024			
Sample Time			.	.	.			
Date Received			30/04/2024	30/04/2024	30/04/2024			
SDG Ref			240430-71	240430-71	240430-71			
Lab Sample No.(s)			29727318	29727335	29727348			
AGS Reference								
Component	**LOD/Units**	**Method**						
Suspended solids, Total	<2 mg/l	TM022	<2 #	<2 #	<2 #			
BOD, unfiltered	<1 mg/l	TM045	<1 @ #	<1 @ #	<1 @ #			
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099	0.012 #	0.052 #	0.026 #			
Arsenic (diss.filt)	<0.5 µg/l	TM152	<0.5 #	<5 #	<0.5 #			
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08 #	<0.8 #	<0.08 #			
Chromium (diss.filt)	<1 µg/l	TM152	<1 #	<10 #	<1 #			
Copper (diss.filt)	<0.3 µg/l	TM152	<0.3 #	<3 #	<0.3 #			
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2 #	<2 #	<0.2 #			
Nickel (diss.filt)	<0.4 µg/l	TM152	<0.4 #	<4 #	<0.4 #			
Selenium (diss.filt)	<1 µg/l	TM152	<1 #	<10 #	<1 #			
Zinc (diss.filt)	<1 µg/l	TM152	1.37 #	<10 #	1.86 #			
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	<0.01			
Nitrite as NO2	<0.05 mg/l	TM184	<0.05 #	<0.05 #	<0.05 #			
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184	<0.05 #	<0.05 #	<0.05 #			
Sulphate	<2 mg/l	TM184	<2 #	2 #	3.7 #			
Chloride	<2 mg/l	TM184	7.4 #	7.9 #	8.8 #			
Nitrate as NO3	<0.3 mg/l	TM184	1.95 #	2.51 #	6.33 #			
pH	<1 pH Units	TM256	7.75 #	7.9 #	8.21 #			
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256	0.123 #	0.141 #	0.342 #			
Alkalinity, Total as CaCO3	<3 mg/l	TM256	48.5 #	57.9 #	170 #			

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CERTIFICATE OF ANALYSIS

SDG: 240430-71 **Report Number:** 728103 **Superseded Report:**
Client Ref.: 501.065477.00001 **Location:** Mounthall, Co.Laois

TPH CWG (W)

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

Customer Sample Ref.			SW1	SW2	SW3			
Depth (m)			0.00 - 0.00	0.00 - 0.00	0.00 - 0.00			
Sample Type			Surface Water (SW)	Surface Water (SW)	Surface Water (SW)			
Date Sampled			25/04/2024	25/04/2024	24/04/2024			
Sample Time			-	-	-			
Date Received			30/04/2024	30/04/2024	30/04/2024			
SDG Ref			240430-71	240430-71	240430-71			
Lab Sample No.(s)			29727318	29727335	29727348			
AGS Reference								
Component	**LOD/Units**	**Method**						
GRO Surrogate % recovery**	%	TM245	106	99	107			
GRO >C5-C12 (HS_1D_TOTAL)	<50 µg/l	TM245	<50 #	<50 #	<50 #			
Aliphatics >C5-C6 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C6-C8 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C8-C10 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C10-C12 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C12-C16 (aq) (SPECD_AL1_W)	<10 µg/l	TM439	<10	<10	<10			
Aliphatics >C16-C21 (aq) (SPECD_AL2_W)	<10 µg/l	TM439	<10	<10	<10			
Aliphatics >C21-C35 (aq) (SPECD_AL3_W)	<10 µg/l	TM439	<10	<10	<10			
Total Aliphatics >C12-C35 (aq) (EPHAL12_35T_GC_W)	<10 µg/l	TM439	<10	<10	<10			
Aromatics >EC5-EC7 (HS_1D_AR)	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC7-EC8 (HS_1D_AR)	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC8-EC10	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC10-EC12	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC12-EC16 (aq) (SPECD_AROM1_W)	<10 µg/l	TM439	<10	<10	<10			
Aromatics >EC16-EC21 (aq) (SPECD_AROM2_W)	<10 µg/l	TM439	<10	<10	<10			
Aromatics >EC21-EC35 (aq) (SPECD_AROM3_W)	<10 µg/l	TM439	<10	<10	<10			
Total Aromatics >EC12-EC35 (aq) (EPHAR12_35T_GC_W)	<10 µg/l	TM439	<10	<10	<10			
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM439	<10	<10	<10			

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CERTIFICATE OF ANALYSIS

SDG: 240430-71 **Report Number:** 728103 **Superseded Report:**
Client Ref.: 501.065477.00001 **Location:** Mounthall, Co.Laois

VOC MS (W)

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

Customer Sample Ref.			SW1	SW2	SW3			
Depth (m)			0.00 - 0.00	0.00 - 0.00	0.00 - 0.00			
Sample Type			Surface Water (SW)	Surface Water (SW)	Surface Water (SW)			
Date Sampled			25/04/2024	25/04/2024	24/04/2024			
Sample Time			.	.	.			
Date Received			30/04/2024	30/04/2024	30/04/2024			
SDG Ref			240430-71	240430-71	240430-71			
Lab Sample No.(s)			29727318	29727335	29727348			
AGS Reference								
Component	**LOD/Units**	**Method**						
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Benzene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Toluene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Ethylbenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
m,p-Xylene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
o-Xylene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Sum of detected Xylenes	<2 µg/l	TM208	<2	<2	<2			
Sum of BTEX	<5 µg/l	TM208	<5	<5	<5			

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Table of Results - Appendix

Method No	Description
TM439	Determination of Extractable Petroleum Hydrocarbons (EPH) CWG banding by GC-FID on liquids
TM152	Analysis of Aqueous Samples by ICP-MS
TM208	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM245	Determination of GRO by Headspace in waters
TM022	Determination of total suspended solids in waters
TM045	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids
TM099	Determination of Ammonium in Water Samples using the Kone Analyser

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NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

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CERTIFICATE OF ANALYSIS

SDG: 240430-71 **Report Number:** 728103 **Superseded Report:**
Client Ref.: 501.065477.00001 **Location:** Mounthall, Co.Laois

Test Completion Dates

Lab Sample No(s)	29727318	29727335	29727348
Customer Sample Ref.	SW1	SW2	SW3
AGS Ref.			
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Surface Water	Surface Water	Surface Water
Ammonium Low	02-May-2024	02-May-2024	02-May-2024
Anions by Kone (w)	07-May-2024	01-May-2024	01-May-2024
BOD True Total	05-May-2024	05-May-2024	05-May-2024
Dissolved Metals by ICP-MS	08-May-2024	08-May-2024	08-May-2024
EPH and CWG by FID	02-May-2024	03-May-2024	02-May-2024
GRO by GC-FID (W)	01-May-2024	01-May-2024	01-May-2024
Mercury Dissolved	03-May-2024	03-May-2024	03-May-2024
Nitrite by Kone (w)	07-May-2024	01-May-2024	01-May-2024
pH Value	02-May-2024	02-May-2024	02-May-2024
Phosphate by Kone (w)	01-May-2024	01-May-2024	01-May-2024
Suspended Solids	04-May-2024	03-May-2024	04-May-2024
TPH CWG (W)	02-May-2024	03-May-2024	02-May-2024
VOC MS (W)	01-May-2024	01-May-2024	01-May-2024

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Appendix

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

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

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19. **Sample Deviations**

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

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

20. **Asbestos**

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

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

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

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

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

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

Attention: Mairead Brown

CERTIFICATE OF ANALYSIS

Date of report Generation:	03 July 2024
Customer:	SLR Consulting Ireland
Sample Delivery Group (SDG):	240624-47
Your Reference:	501.065477.00001
Location:	Mounthall Co. Laois
Report No:	733574
Order Number:	1279

We received 8 samples on Monday June 24, 2024 and 8 of these samples were scheduled for analysis which was completed on Wednesday July 03, 2024. 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

Validated

CERTIFICATE OF ANALYSIS

SDG: 240624-47 **Report Number:** 733574 **Superseded Report:**
Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
29972305	BH01		0.00 - 0.00	18/06/2024
29972314	BH02		0.00 - 0.00	18/06/2024
29972322	BH03		0.00 - 0.00	18/06/2024
29972330	BH04		0.00 - 0.00	18/06/2024
29972339	BH05		0.00 - 0.00	19/06/2024
29972349	BH06		0.00 - 0.00	19/06/2024
29972358	BH07		0.00 - 0.00	18/06/2024
29972367	BH08		0.00 - 0.00	18/06/2024

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

CERTIFICATE OF ANALYSIS

SDG: 240624-47 **Report Number:** 733574 **Superseded Report:**
Client Ref.: 501.065477.00001 **Location:** Mountthall Co. Laois

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Results Legend

- X Test
- N No Determination Possible

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

Lab Sample No(s)			29972305					29972314					29972322					29972330			
Customer Sample Reference			BH01					BH02					BH03					BH04			
AGS Reference																					
Depth (m)			0.00 - 0.00					0.00 - 0.00					0.00 - 0.00					0.00 - 0.00			
Container			0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)
Sample Type			GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 8			X					X					X					X	
Anions by Kone (w)	All	NDPs: 0 Tests: 8		X					X					X					X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 8				X					X					X					X
EPH and CWG by FID	All	NDPs: 0 Tests: 8		X					X					X					X		
Fluoride	All	NDPs: 0 Tests: 8		X					X					X					X		
GRO by GC-FID (W)	All	NDPs: 0 Tests: 8					X					X					X				
Mercury Dissolved	All	NDPs: 0 Tests: 8				X					X					X					X
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 8	X					X					X					X			
pH Value	All	NDPs: 0 Tests: 8		X					X					X					X		
Phosphate by Kone (w)	All	NDPs: 0 Tests: 8		X					X					X					X		
TPH CWG (W)	All	NDPs: 0 Tests: 8	X					X					X					X			
VOC MS (W)	All	NDPs: 0 Tests: 8					X					X					X				

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29972367	BH08		0.00 - 0.00	Vial (ALE297)	GW						X						X
				HNO3 Filtered (ALE204)	GW			X				X					
				H2SO4 (ALE244)	GW	X											
				500ml Plastic (ALE208)	GW		X		X	X				X	X		
				0.5l glass bottle (ALE227)	GW								X			X	
29972358	BH07		0.00 - 0.00	Vial (ALE297)	GW						X						X
				HNO3 Filtered (ALE204)	GW			X				X					
				H2SO4 (ALE244)	GW	X											
				500ml Plastic (ALE208)	GW		X			X				X	X		
				0.5l glass bottle (ALE227)	GW				X				X			X	
29972349	BH06		0.00 - 0.00	Vial (ALE297)	GW						X						X
				HNO3 Filtered (ALE204)	GW			X									
				H2SO4 (ALE244)	GW	X											
				500ml Plastic (ALE208)	GW		X		X	X		X		X	X		
				0.5l glass bottle (ALE227)	GW								X			X	
29972339	BH05		0.00 - 0.00	Vial (ALE297)	GW						X						X
				HNO3 Filtered (ALE204)	GW			X				X					
				H2SO4 (ALE244)	GW	X											
				500ml Plastic (ALE208)	GW		X		X	X				X	X		
				0.5l glass bottle (ALE227)	GW								X			X	
29972330	BH04		0.00 - 0.00	Vial (ALE297)	GW						X						X

Validated

CERTIFICATE OF ANALYSIS

SDG: 240624-47 **Report Number:** 733574 **Superseded Report:**
Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

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

Customer Sample Ref.			BH01	BH02	BH03	BH04	BH05	BH06
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
Sample Type			Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
Date Sampled			18/06/2024	18/06/2024	18/06/2024	18/06/2024	19/06/2024	19/06/2024
Sample Time			.	.	.	.	.	.
Date Received			24/06/2024	24/06/2024	24/06/2024	24/06/2024	24/06/2024	24/06/2024
SDG Ref			240624-47	240624-47	240624-47	240624-47	240624-47	240624-47
Lab Sample No.(s)			29972305	29972314	29972322	29972330	29972339	29972349
AGS Reference								
Component	**LOD/Units**	**Method**						
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2 #	<0.2 #	<0.2 #	<0.2 #	<0.2 #	<0.2 #
Ammoniacal Nitrogen as NH3	<0.2 mg/l	TM099	<0.2 #	<0.2 #	<0.2 #	<0.2 #	<0.2 #	<0.2 #
Fluoride	<0.5 mg/l	TM104	<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #
Aluminium (diss.filt)	<10 µg/l	TM152	<10 #	<10 #	<10 #	<10 #	<10 #	48 #
Arsenic (diss.filt)	<0.5 µg/l	TM152	<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #	1.06 #
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08 #	<0.08 #	<0.08 #	<0.08 #	<0.08 #	<0.08 #
Chromium (diss.filt)	<1 µg/l	TM152	<1 #	<1 #	<1 #	<1 #	<1 #	2.12 #
Copper (diss.filt)	<0.3 µg/l	TM152	3.23 #	0.55 #	0.566 #	2.25 #	3.15 #	3.2 #
Lead (diss.filt)	<0.2 µg/l	TM152	0.518 #	<0.2 #	<0.2 #	0.372 #	0.538 #	0.351 #
Nickel (diss.filt)	<0.4 µg/l	TM152	0.646 #	0.48 #	0.639 #	0.646 #	1.34 #	1.52 #
Zinc (diss.filt)	<1 µg/l	TM152	37.4 #	9.14 #	11.2 #	20.3 #	38.6 #	10 #
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	1.27 #	2.96 #	2.48 #	3.41 #	1.94 #	2.9 #
Iron (Dis.Filt)	<0.019 mg/l	TM152	<0.019 #	<0.019 #	<0.019 #	<0.019 #	<0.019 #	0.0945 #
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 2 #
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184	<0.05 #	<0.05 #	<0.05 #	<0.05 #	0.053 #	<0.05 #
Sulphate	<2 mg/l	TM184	<2 #	3.1 #	<2 #	4 #	3.4 #	6.7 #
Chloride	<2 mg/l	TM184	3.4 #	8.5 #	4.2 #	12.4 #	9.3 #	10.1 #
Nitrate as NO3	<0.3 mg/l	TM184	2.63 #	4.41 #	5.53 #	10.9 #	2.64 #	5.07 #
pH	<1 pH Units	TM256	6.51 #	7.59 #	7.43 #	7.27 #	7.41 #	8 #
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256	0.166 #	0.426 #	0.502 #	0.479 #	0.332 #	0.568 #

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CERTIFICATE OF ANALYSIS

SDG: 240624-47 **Report Number:** 733574 **Superseded Report:**
Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

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

Customer Sample Ref.			BH07	BH08				
Depth (m)			0.00 - 0.00	0.00 - 0.00				
Sample Type			Ground Water (GW)	Ground Water (GW)				
Date Sampled			18/06/2024	18/06/2024				
Sample Time			-	-				
Date Received			24/06/2024	24/06/2024				
SDG Ref			240624-47	240624-47				
Lab Sample No.(s)			29972358	29972367				
AGS Reference								
Component	**LOD/Units**	**Method**						
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2 #	<0.2 #				
Ammoniacal Nitrogen as NH3	<0.2 mg/l	TM099	<0.2 #	<0.2 #				
Fluoride	<0.5 mg/l	TM104	<0.5 #	<0.5 #				
Aluminium (diss.filt)	<10 µg/l	TM152	<10 #	10.1 #				
Arsenic (diss.filt)	<0.5 µg/l	TM152	<0.5 #	<0.5 #				
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08 #	<0.08 #				
Chromium (diss.filt)	<1 µg/l	TM152	<1 #	1.09 #				
Copper (diss.filt)	<0.3 µg/l	TM152	1.95 #	0.378 #				
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2 #	<0.2 #				
Nickel (diss.filt)	<0.4 µg/l	TM152	1.61 #	0.498 #				
Zinc (diss.filt)	<1 µg/l	TM152	7.83 #	3 #				
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	8.99 #	2.86 #				
Iron (Dis.Filt)	<0.019 mg/l	TM152	<0.019 #	<0.019 #				
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01 #	<0.01 #				
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184	<0.05 #	<0.05 #				
Sulphate	<2 mg/l	TM184	5.3 #	3.7 #				
Chloride	<2 mg/l	TM184	5.3 #	6.8 #				
Nitrate as NO3	<0.3 mg/l	TM184	1.37 #	7.68 #				
pH	<1 pH Units	TM256	7.08 #	7.65 #				
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256	0.573 #	0.445 #				

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SDG: 240624-47 **Report Number:** 733574 **Superseded Report:**
Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

PAH Spec MS - Aqueous (W)

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

Customer Sample Ref.			BH01	BH02	BH03	BH04	BH05	BH06
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
Sample Type			Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
Date Sampled			18/06/2024	18/06/2024	18/06/2024	18/06/2024	19/06/2024	19/06/2024
Sample Time			.	.	.	.	.	.
Date Received			24/06/2024	24/06/2024	24/06/2024	24/06/2024	24/06/2024	24/06/2024
SDG Ref			240624-47	240624-47	240624-47	240624-47	240624-47	240624-47
Lab Sample No.(s)			29972305	29972314	29972322	29972330	29972339	29972349
AGS Reference								
Component	**LOD/Units**	**Method**						
Naphthalene (aq)	<0.01 µg/l	TM178	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.05 #	<0.05 #
Acenaphthene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.025 #	<0.025 #
Acenaphthylene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.025 #	<0.025 #
Fluoranthene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.025 #	<0.025 #
Anthracene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.025 #	<0.025 #
Phenanthrene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.025 #	<0.025 #
Fluorene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.025 #	<0.025 #
Chrysene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.025 #	<0.025 #
Pyrene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.025 #	<0.025 #
Benzo(a)anthracene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.025 #	<0.025 #
Benzo(b)fluoranthene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.025 #	<0.025 #
Benzo(k)fluoranthene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.025 #	<0.025 #
Benzo(a)pyrene (aq)	<0.002 µg/l	TM178	<0.002 #	<0.002 #	<0.002 #	<0.002 #	<0.01 #	<0.01 #
Dibenzo(a,h)anthracene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.025 #	<0.025 #
Benzo(g,h,i)perylene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.025 #	<0.025 #
Indeno(1,2,3-cd)pyrene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.025 #	<0.025 #
PAH, Total Detected USEPA 16 (aq)	<0.082 µg/l	TM178	<0.082 #	<0.082 #	<0.082 #	<0.082 #	<0.41 #	<0.41 #

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CERTIFICATE OF ANALYSIS

SDG: 240624-47 **Report Number:** 733574 **Superseded Report:**
Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

PAH Spec MS - Aqueous (W)

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

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Customer Sample Ref.			BH07	BH08				
Depth (m)			0.00 - 0.00	0.00 - 0.00				
Sample Type			Ground Water (GW)	Ground Water (GW)				
Date Sampled			18/06/2024	18/06/2024				
Sample Time			.	.				
Date Received			24/06/2024	24/06/2024				
SDG Ref			240624-47	240624-47				
Lab Sample No.(s)			29972358	29972367				
AGS Reference								
Component	**LOD/Units**	**Method**						
Naphthalene (aq)	<0.01 µg/l	TM178	<0.01 #	<0.01 #				
Acenaphthene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #				
Acenaphthylene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #				
Fluoranthene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #				
Anthracene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #				
Phenanthrene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #				
Fluorene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #				
Chrysene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #				
Pyrene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #				
Benzo(a)anthracene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #				
Benzo(b)fluoranthene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #				
Benzo(k)fluoranthene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #				
Benzo(a)pyrene (aq)	<0.002 µg/l	TM178	<0.002 #	<0.002 #				
Dibenzo(a,h)anthracene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #				
Benzo(g,h,i)perylene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #				
Indeno(1,2,3-cd)pyrene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 #				
PAH, Total Detected USEPA 16 (aq)	<0.082 µg/l	TM178	<0.082 #	<0.082 #				

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CERTIFICATE OF ANALYSIS

SDG: 240624-47 **Report Number:** 733574 **Superseded Report:**
Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

TPH CWG (W)

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

Component	LOD/Units	Method	BH01	BH02	BH03	BH04	BH05	BH06
Customer Sample Ref.			BH01	BH02	BH03	BH04	BH05	BH06
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
Sample Type			Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
Date Sampled			18/06/2024	18/06/2024	18/06/2024	18/06/2024	19/06/2024	19/06/2024
Sample Time			.	.	.	.	.	.
Date Received			24/06/2024	24/06/2024	24/06/2024	24/06/2024	24/06/2024	24/06/2024
SDG Ref			240624-47	240624-47	240624-47	240624-47	240624-47	240624-47
Lab Sample No.(s)			29972305	29972314	29972322	29972330	29972339	29972349
AGS Reference								
GRO Surrogate % recovery**	%	TM245	94	93	88	76	87	92
GRO >C5-C12 (HS_1D_TOTAL)	<50 µg/l	TM245	<50 #	<50 #	<50 #	<50 #	<50 #	<50 #
Aliphatics >C5-C6 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aliphatics >C6-C8 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aliphatics >C8-C10 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aliphatics >C10-C12 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aliphatics >C12-C16 (aq) (SPECD_AL1_W)	<10 µg/l	TM439	<10	<10	<10	<10	<50	<50
Aliphatics >C16-C21 (aq) (SPECD_AL2_W)	<10 µg/l	TM439	<10	<10	<10	<10	<50	<50
Aliphatics >C21-C35 (aq) (SPECD_AL3_W)	<10 µg/l	TM439	<10	<10	<10	<10	<50	<50
Total Aliphatics >C12-C35 (aq) (EPHAL12_35T_GC_W)	<10 µg/l	TM439	<10	<10	<10	<10	<50	<50
Aromatics >EC5-EC7 (HS_1D_AR)	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aromatics >EC7-EC8 (HS_1D_AR)	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aromatics >EC8-EC10	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aromatics >EC10-EC12	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aromatics >EC12-EC16 (aq) (SPECD_AROM1_W)	<10 µg/l	TM439	<10	<10	<10	<10	<50	<50
Aromatics >EC16-EC21 (aq) (SPECD_AROM2_W)	<10 µg/l	TM439	<10	<10	<10	<10	<50	<50
Aromatics >EC21-EC35 (aq) (SPECD_AROM3_W)	<10 µg/l	TM439	<10	<10	<10	<10	<50	<50
Total Aromatics >EC12-EC35 (aq) (EPHAR12_35T_GC_W)	<10 µg/l	TM439	<10	<10	<10	<10	<50	<50
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM439	<10	<10	<10	<10	<50	<50

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CERTIFICATE OF ANALYSIS

SDG: 240624-47 **Report Number:** 733574 **Superseded Report:**
Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

TPH CWG (W)

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

Customer Sample Ref.			BH07	BH08				
Depth (m)			0.00 - 0.00	0.00 - 0.00				
Sample Type			Ground Water (GW)	Ground Water (GW)				
Date Sampled			18/06/2024	18/06/2024				
Sample Time			-	-				
Date Received			24/06/2024	24/06/2024				
SDG Ref			240624-47	240624-47				
Lab Sample No.(s)			29972358	29972367				
AGS Reference								
Component	**LOD/Units**	**Method**						
GRO Surrogate % recovery**	%	TM245	86	88				
GRO >C5-C12 (HS_1D_TOTAL)	<50 µg/l	TM245	<50 #	<50 #				
Aliphatics >C5-C6 (HS_1D_AL)	<10 µg/l	TM245	<10	<10				
Aliphatics >C6-C8 (HS_1D_AL)	<10 µg/l	TM245	<10	<10				
Aliphatics >C8-C10 (HS_1D_AL)	<10 µg/l	TM245	<10	<10				
Aliphatics >C10-C12 (HS_1D_AL)	<10 µg/l	TM245	<10	<10				
Aliphatics >C12-C16 (aq) (SPECD_AL1_W)	<10 µg/l	TM439	<10	<10				
Aliphatics >C16-C21 (aq) (SPECD_AL2_W)	<10 µg/l	TM439	<10	<10				
Aliphatics >C21-C35 (aq) (SPECD_AL3_W)	<10 µg/l	TM439	<10	<10				
Total Aliphatics >C12-C35 (aq) (EPHAL12_35T_GC_W)	<10 µg/l	TM439	<10	<10				
Aromatics >EC5-EC7 (HS_1D_AR)	<10 µg/l	TM245	<10	<10				
Aromatics >EC7-EC8 (HS_1D_AR)	<10 µg/l	TM245	<10	<10				
Aromatics >EC8-EC10	<10 µg/l	TM245	<10	<10				
Aromatics >EC10-EC12	<10 µg/l	TM245	<10	<10				
Aromatics >EC12-EC16 (aq) (SPECD_AROM1_W)	<10 µg/l	TM439	<10	<10				
Aromatics >EC16-EC21 (aq) (SPECD_AROM2_W)	<10 µg/l	TM439	<10	<10				
Aromatics >EC21-EC35 (aq) (SPECD_AROM3_W)	<10 µg/l	TM439	<10	<10				
Total Aromatics >EC12-EC35 (aq) (EPHAR12_35T_GC_W)	<10 µg/l	TM439	<10	<10				
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM439	<10	<10				

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Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

VOC MS (W)

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

Customer Sample Ref.			BH01	BH02	BH03	BH04	BH05	BH06
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
Sample Type			Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
Date Sampled			18/06/2024	18/06/2024	18/06/2024	18/06/2024	19/06/2024	19/06/2024
Sample Time			.	.	.	.	.	.
Date Received			24/06/2024	24/06/2024	24/06/2024	24/06/2024	24/06/2024	24/06/2024
SDG Ref			240624-47	240624-47	240624-47	240624-47	240624-47	240624-47
Lab Sample No.(s)			29972305	29972314	29972322	29972330	29972339	29972349
AGS Reference								
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 #
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 #	<1 #
o-Xylene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Sum of detected Xylenes	<2 µg/l	TM208	<2	<2	<2	<2	<2	<2
Sum of BTEX	<5 µg/l	TM208	<5	<5	<5	<5	<5	<5

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VOC MS (W)

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

Customer Sample Ref.			BH07	BH08				
Depth (m)			0.00 - 0.00	0.00 - 0.00				
Sample Type			Ground Water (GW)	Ground Water (GW)				
Date Sampled			18/06/2024	18/06/2024				
Sample Time			.	.				
Date Received			24/06/2024	24/06/2024				
SDG Ref			240624-47	240624-47				
Lab Sample No.(s)			29972358	29972367				
AGS Reference								
Component	**LOD/Units**	**Method**						
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1 #	<1 #				
Benzene	<1 µg/l	TM208	<1 #	<1 #				
Toluene	<1 µg/l	TM208	<1 #	<1 #				
Ethylbenzene	<1 µg/l	TM208	<1 #	<1 #				
m,p-Xylene	<1 µg/l	TM208	<1 #	<1 #				
o-Xylene	<1 µg/l	TM208	<1 #	<1 #				
Sum of detected Xylenes	<2 µg/l	TM208	<2	<2				
Sum of BTEX	<5 µg/l	TM208	<5	<5				

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Table of Results - Appendix

Method No	Description
TM099	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Determination of Fluoride using the Kone Analyser
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM245	Determination of GRO by Headspace in waters
TM178	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM439	Determination of Extractable Petroleum Hydrocarbons (EPH) CWG banding by GC-FID on liquids
TM152	Analysis of Aqueous Samples by ICP-MS
TM208	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples

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NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

Validated

CERTIFICATE OF ANALYSIS

SDG: 240624-47 **Report Number:** 733574 **Superseded Report:**
Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

Test Completion Dates

Lab Sample No(s)	29972305	29972314	29972322	29972330	29972339	29972349	29972358	29972367
Customer Sample Ref.	BH01	BH02	BH03	BH04	BH05	BH06	BH07	BH08
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
Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Ammoniacal Nitrogen	27-Jun-2024	27-Jun-2024	27-Jun-2024	27-Jun-2024	27-Jun-2024	28-Jun-2024	28-Jun-2024	27-Jun-2024
Anions by Kone (w)	27-Jun-2024	27-Jun-2024	27-Jun-2024	27-Jun-2024	27-Jun-2024	27-Jun-2024	27-Jun-2024	27-Jun-2024
Dissolved Metals by ICP-MS	01-Jul-2024	28-Jun-2024	28-Jun-2024	28-Jun-2024	28-Jun-2024	01-Jul-2024	28-Jun-2024	28-Jun-2024
EPH and CWG by FID	03-Jul-2024	03-Jul-2024	03-Jul-2024	03-Jul-2024	03-Jul-2024	03-Jul-2024	01-Jul-2024	03-Jul-2024
Fluoride	26-Jun-2024	26-Jun-2024	26-Jun-2024	26-Jun-2024	26-Jun-2024	26-Jun-2024	26-Jun-2024	26-Jun-2024
GRO by GC-FID (W)	26-Jun-2024	26-Jun-2024	26-Jun-2024	26-Jun-2024	26-Jun-2024	26-Jun-2024	26-Jun-2024	26-Jun-2024
Mercury Dissolved	28-Jun-2024	28-Jun-2024	28-Jun-2024	28-Jun-2024	28-Jun-2024	01-Jul-2024	28-Jun-2024	28-Jun-2024
Nitrite by Kone (w)	26-Jun-2024	26-Jun-2024	26-Jun-2024	26-Jun-2024	26-Jun-2024	27-Jun-2024	27-Jun-2024	27-Jun-2024
PAH Spec MS - Aqueous (W)	28-Jun-2024	28-Jun-2024	28-Jun-2024	28-Jun-2024	28-Jun-2024	01-Jul-2024	28-Jun-2024	28-Jun-2024
pH Value	28-Jun-2024	28-Jun-2024	28-Jun-2024	28-Jun-2024	28-Jun-2024	28-Jun-2024	28-Jun-2024	28-Jun-2024
Phosphate by Kone (w)	27-Jun-2024	27-Jun-2024	27-Jun-2024	27-Jun-2024	27-Jun-2024	27-Jun-2024	27-Jun-2024	27-Jun-2024
TPH CWG (W)	03-Jul-2024	03-Jul-2024	03-Jul-2024	03-Jul-2024	03-Jul-2024	03-Jul-2024	01-Jul-2024	03-Jul-2024
VOC MS (W)	26-Jun-2024	26-Jun-2024	26-Jun-2024	26-Jun-2024	26-Jun-2024	26-Jun-2024	26-Jun-2024	26-Jun-2024

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Appendix

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

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

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19. **Sample Deviations**

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

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

20. **Asbestos**

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

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

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

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

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

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

Attention: Mairead Brown

CERTIFICATE OF ANALYSIS

Date of report Generation:	11 July 2024
Customer:	SLR Consulting Ireland
Sample Delivery Group (SDG):	240624-48
Your Reference:	501.065477.00001
Location:	Mounthall, Co. Laois
Report No:	734331
Order Number:	1278

This report has been revised and directly supersedes 733568 in its entirety.

We received 3 samples on Monday June 24, 2024 and 3 of these samples were scheduled for analysis which was completed on Thursday July 11, 2024. 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

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
29972386	SW1		0.00 - 0.00	19/06/2024
29972395	SW2		0.00 - 0.00	19/06/2024
29972405	SW3		0.00 - 0.00	19/06/2024

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

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CERTIFICATE OF ANALYSIS

SDG: 240624-48 **Report Number:** 734331 **Superseded Report:** 733568
Client Ref.: 501.065477.00001 **Location:** Mounthall, Co. Laois

RECEIVED: 19/09/2024

Results Legend

X Test

N No Determination Possible

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

Lab Sample No(s)			29972386							29972395							29972405					
Customer Sample Reference			SW1							SW2							SW3					
AGS Reference																						
Depth (m)			0.00 - 0.00							0.00 - 0.00							0.00 - 0.00					
Container			0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)
Sample Type			SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 3				X							X							X	
Anions by Kone (w)	All	NDPs: 0 Tests: 3			X							X							X		
BOD True Total	All	NDPs: 0 Tests: 3		X							X							X			
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 3					X							X							X
EPH and CWG by FID	All	NDPs: 0 Tests: 3	X							X							X				
GRO by GC-FID (W)	All	NDPs: 0 Tests: 3							X							X					
Mercury Dissolved	All	NDPs: 0 Tests: 3					X							X							X
Nitrite by Kone (w)	All	NDPs: 0 Tests: 3						X							X						
pH Value	All	NDPs: 0 Tests: 3			X							X							X		
Phosphate by Kone (w)	All	NDPs: 0 Tests: 3			X							X							X		
Suspended Solids	All	NDPs: 0 Tests: 3			X							X							X		
TPH CWG (W)	All	NDPs: 0 Tests: 3	X							X							X				
VOC MS (W)	All	NDPs: 0 Tests: 3							X							X					

29972405	SW3		0.00 - 0.00	Vial (ALE297)	SW											X															X
				NaOH (ALE245)	SW															X											

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CERTIFICATE OF ANALYSIS

SDG: 240624-48 **Report Number:** 734331 **Superseded Report:** 733568
Client Ref.: 501.065477.00001 **Location:** Mounthall, Co. Laois

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

Customer Sample Ref.			SW1	SW2	SW3			
Depth (m)			0.00 - 0.00	0.00 - 0.00	0.00 - 0.00			
Sample Type			Surface Water (SW)	Surface Water (SW)	Surface Water (SW)			
Date Sampled			19/06/2024	19/06/2024	19/06/2024			
Sample Time			-	-	-			
Date Received			24/06/2024	24/06/2024	24/06/2024			
SDG Ref			240624-48	240624-48	240624-48			
Lab Sample No.(s)			29972386	29972395	29972405			
AGS Reference								
Component	**LOD/Units**	**Method**						
Suspended solids, Total	<2 mg/l	TM022	<2 #	<2 #	<2 #			
BOD, unfiltered	<1 mg/l	TM045	<1 @ #	<1 @ #	<1 @ #			
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2 #	<0.2 #	<0.2 #			
Arsenic (diss.filt)	<0.5 µg/l	TM152	<0.5 #	<0.5 #	<0.5 #			
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08 #	<0.08 #	<0.08 #			
Chromium (diss.filt)	<1 µg/l	TM152	<1 #	<1 #	<1 #			
Copper (diss.filt)	<0.3 µg/l	TM152	<0.3 #	<0.3 #	<0.3 #			
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2 #	<0.2 #	<0.2 #			
Nickel (diss.filt)	<0.4 µg/l	TM152	<0.4 #	<0.4 #	<0.4 #			
Selenium (diss.filt)	<1 µg/l	TM152	<1 #	<1 #	<1 #			
Zinc (diss.filt)	<1 µg/l	TM152	1.28 #	<1 #	1.6 #			
Mercury (diss.filt)	<0.01 µg/l	TM183	0.0248	<0.01	<0.01			
Nitrite as NO2	<0.05 mg/l	TM184	<0.05 #	<0.05 #	<0.05 #			
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184	<0.05 #	<0.05 #	<0.05 #			
Sulphate	<2 mg/l	TM184	<2 #	<2 #	4.6 #			
Chloride	<2 mg/l	TM184	7.2 #	7.6 #	8.7 #			
Nitrate as NO3	<0.3 mg/l	TM184	1.64 #	1.44 #	6.81 #			
pH	<1 pH Units	TM256	7.78 #	7.91 #	8.31 #			
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256	0.136 #	0.151 #	0.336 #			
Alkalinity, Total as CaCO3	<3 mg/l	TM256	59.8 #	67.3 #	172 #			

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CERTIFICATE OF ANALYSIS

SDG: 240624-48 **Report Number:** 734331 **Superseded Report:** 733568
Client Ref.: 501.065477.00001 **Location:** Mounthall, Co. Laois

TPH CWG (W)

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

Customer Sample Ref.			SW1	SW2	SW3			
Depth (m)			0.00 - 0.00	0.00 - 0.00	0.00 - 0.00			
Sample Type			Surface Water (SW)	Surface Water (SW)	Surface Water (SW)			
Date Sampled			19/06/2024	19/06/2024	19/06/2024			
Sample Time			.	.	.			
Date Received			24/06/2024	24/06/2024	24/06/2024			
SDG Ref			240624-48	240624-48	240624-48			
Lab Sample No.(s)			29972386	29972395	29972405			
AGS Reference								
Component	**LOD/Units**	**Method**						
GRO Surrogate % recovery**	%	TM245	106	104	101			
GRO >C5-C12 (HS_1D_TOTAL)	<50 µg/l	TM245	<50 #	<50 #	<50 #			
Aliphatics >C5-C6 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C6-C8 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C8-C10 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C10-C12 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10			
Aliphatics >C12-C16 (aq) (SPECD_AL1_W)	<10 µg/l	TM439	<10	<10	<10			
Aliphatics >C16-C21 (aq) (SPECD_AL2_W)	<10 µg/l	TM439	<10	<10	<10			
Aliphatics >C21-C35 (aq) (SPECD_AL3_W)	<10 µg/l	TM439	<10	<10	<10			
Total Aliphatics >C12-C35 (aq) (EPHAL12_35T_GC_W)	<10 µg/l	TM439	<10	<10	<10			
Aromatics >EC5-EC7 (HS_1D_AR)	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC7-EC8 (HS_1D_AR)	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC8-EC10	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC10-EC12	<10 µg/l	TM245	<10	<10	<10			
Aromatics >EC12-EC16 (aq) (SPECD_AROM1_W)	<10 µg/l	TM439	<10	<10	<10			
Aromatics >EC16-EC21 (aq) (SPECD_AROM2_W)	<10 µg/l	TM439	<10	<10	<10			
Aromatics >EC21-EC35 (aq) (SPECD_AROM3_W)	<10 µg/l	TM439	<10	<10	<10			
Total Aromatics >EC12-EC35 (aq) (EPHAR12_35T_GC_W)	<10 µg/l	TM439	<10	<10	<10			
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM439	<10	<10	<10			

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Validated

CERTIFICATE OF ANALYSIS

SDG: 240624-48 **Report Number:** 734331 **Superseded Report:** 733568
Client Ref.: 501.065477.00001 **Location:** Mounthall, Co. Laois

VOC MS (W)

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

Customer Sample Ref.			SW1	SW2	SW3			
Depth (m)			0.00 - 0.00	0.00 - 0.00	0.00 - 0.00			
Sample Type			Surface Water (SW)	Surface Water (SW)	Surface Water (SW)			
Date Sampled			19/06/2024	19/06/2024	19/06/2024			
Sample Time			.	.	.			
Date Received			24/06/2024	24/06/2024	24/06/2024			
SDG Ref			240624-48	240624-48	240624-48			
Lab Sample No.(s)			29972386	29972395	29972405			
AGS Reference								
Component	**LOD/Units**	**Method**						
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Benzene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Toluene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Ethylbenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
m,p-Xylene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
o-Xylene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Sum of detected Xylenes	<2 µg/l	TM208	<2	<2	<2			
Sum of BTEX	<5 µg/l	TM208	<5	<5	<5			

RECEIVED: 19/09/2024

11:22:18 11/07/2024

Table of Results - Appendix

Method No	Description
TM152	Analysis of Aqueous Samples by ICP-MS
TM208	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM439	Determination of Extractable Petroleum Hydrocarbons (EPH) CWG banding by GC-FID on liquids
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM245	Determination of GRO by Headspace in waters
TM022	Determination of total suspended solids in waters
TM045	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids
TM099	Determination of Ammonium in Water Samples using the Kone Analyser

RECEIVED: 19/09/2024

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

Test Completion Dates

Lab Sample No(s)	29972386	29972395	29972405
Customer Sample Ref.	SW1	SW2	SW3
AGS Ref.			
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Surface Water	Surface Water	Surface Water
Ammoniacal Nitrogen	28-Jun-2024	28-Jun-2024	28-Jun-2024
Anions by Kone (w)	27-Jun-2024	27-Jun-2024	27-Jun-2024
BOD True Total	29-Jun-2024	29-Jun-2024	29-Jun-2024
Dissolved Metals by ICP-MS	11-Jul-2024	11-Jul-2024	11-Jul-2024
EPH and CWG by FID	03-Jul-2024	03-Jul-2024	03-Jul-2024
GRO by GC-FID (W)	26-Jun-2024	26-Jun-2024	26-Jun-2024
Mercury Dissolved	09-Jul-2024	09-Jul-2024	09-Jul-2024
Nitrite by Kone (w)	27-Jun-2024	27-Jun-2024	27-Jun-2024
pH Value	28-Jun-2024	28-Jun-2024	28-Jun-2024
Phosphate by Kone (w)	27-Jun-2024	27-Jun-2024	27-Jun-2024
Suspended Solids	29-Jun-2024	29-Jun-2024	29-Jun-2024
TPH CWG (W)	03-Jul-2024	03-Jul-2024	03-Jul-2024
VOC MS (W)	26-Jun-2024	26-Jun-2024	26-Jun-2024

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Appendix

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

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

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19. **Sample Deviations**

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

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

20. **Asbestos**

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

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

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

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

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

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

Attention: Mairead Brown

CERTIFICATE OF ANALYSIS

Date of report Generation:	26 July 2024
Customer:	SLR Consulting Ireland
Sample Delivery Group (SDG):	240717-88
Your Reference:	501.065477.00001
Location:	Mounthall Co. Laois
Report No:	735910
Order Number:	1279

This report has been revised and directly supersedes 735908 in its entirety.

We received 11 samples on Monday July 15, 2024 and 11 of these samples were scheduled for analysis which was completed on Friday July 26, 2024. 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:

Lauren Ellis
General Manager Western Europe Environmental

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
30091025	BH01		0.00 - 0.00	09/07/2024
30091053	BH02		0.00 - 0.00	09/07/2024
30091061	BH03		0.00 - 0.00	09/07/2024
30091069	BH04		0.00 - 0.00	09/07/2024
30091078	BH05		0.00 - 0.00	09/07/2024
30091086	BH06		0.00 - 0.00	09/07/2024
30091094	BH07		0.00 - 0.00	09/07/2024
30091102	BH08		0.00 - 0.00	09/07/2024
30121807	SW1		0.00 - 0.00	10/07/2024
30091110	SW2		0.00 - 0.00	10/07/2024
30091044	SW3		0.00 - 0.00	10/07/2024

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

Validated

CERTIFICATE OF ANALYSIS

SDG: 240717-88 **Report Number:** 735910 **Superseded Report:** 735908
Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

RECEIVED: 19/09/2024

Results Legend

X Test

N No Determination Possible

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

Lab Sample No(s)			30091025					30091053					30091061					30091069			
Customer Sample Reference			BH01					BH02					BH03					BH04			
AGS Reference																					
Depth (m)			0.00 - 0.00					0.00 - 0.00					0.00 - 0.00					0.00 - 0.00			
Container			0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)
Sample Type			GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 7			X					X					X					X	
Ammonium Low	All	NDPs: 0 Tests: 3																			
Anions by Kone (w)	All	NDPs: 0 Tests: 10		X					X					X					X		
BOD True Total	All	NDPs: 0 Tests: 3																			
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 11				X					X					X					X
EPH and CWG by FID	All	NDPs: 0 Tests: 10					X					X					X				
Fluoride	All	NDPs: 0 Tests: 7		X					X					X					X		
GRO by GC-FID (W)	All	NDPs: 0 Tests: 10					X					X					X				
Mercury Dissolved	All	NDPs: 0 Tests: 11				X					X					X					X
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 7	X					X					X					X			
pH Value	All	NDPs: 0 Tests: 10		X					X					X					X		
Phosphate by Kone (w)	All	NDPs: 0 Tests: 10		X					X					X					X		
Suspended Solids	All	NDPs: 0 Tests: 3																			
TPH CWG (W)	All	NDPs: 0 Tests: 10	X					X					X					X			
VOC MS (W)	All	NDPs: 0 Tests: 10					X					X					X				

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30121807	SW1		0.00 - 0.00	HNO3 Filtered (ALE204)	SW					X				X							
				H2SO4 (ALE244)	SW		X														
				500ml Plastic (ALE208)	SW			X									X	X	X		
				250ml BOD (ALE212)	SW				X												
				0.5l glass bottle (ALE227)	SW															X	
30091094	BH07		0.00 - 0.00	Vial (ALE297)	GW						X		X								X
				HNO3 Filtered (ALE204)	GW					X				X							
				H2SO4 (ALE244)	GW	X															
				500ml Plastic (ALE208)	GW			X		X		X		X			X	X			
				0.5l glass bottle (ALE227)	GW										X					X	
30091086	BH06		0.00 - 0.00	Vial (ALE297)	GW								X								X
				HNO3 Filtered (ALE204)	GW					X											
				H2SO4 (ALE244)	GW	X															
				500ml Plastic (ALE208)	GW			X			X	X		X			X	X			
				0.5l glass bottle (ALE227)	GW										X					X	
30091078	BH05		0.00 - 0.00	Vial (ALE297)	GW								X								X
				HNO3 Filtered (ALE204)	GW					X				X							
				H2SO4 (ALE244)	GW	X															
				500ml Plastic (ALE208)	GW			X			X	X					X	X			
				0.5l glass bottle (ALE227)	GW										X					X	
30091069	BH04		0.00 - 0.00	Vial (ALE297)	GW						X		X								X

Validated

CERTIFICATE OF ANALYSIS

SDG: 240717-88 **Report Number:** 735910 **Superseded Report:** 735908
Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

RECEIVED: 19/09/2024

Results Legend

X Test

N No Determination Possible

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

Lab Sample No(s)			30121807					30091110									30091044	
Customer Sample Reference			SW1					SW2									SW3	
AGS Reference																		
Depth (m)			0.00 - 0.00					0.00 - 0.00									0.00 - 0.00	
Container			NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)
Sample Type			SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
Ammonium Low	All	NDPs: 0 Tests: 3						X							X			
Anions by Kone (w)	All	NDPs: 0 Tests: 10					X							X				
BOD True Total	All	NDPs: 0 Tests: 3				X							X					
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 11							X							X		
EPH and CWG by FID	All	NDPs: 0 Tests: 10		X	X													X
GRO by GC-FID (W)	All	NDPs: 0 Tests: 10		X							X							X
Mercury Dissolved	All	NDPs: 0 Tests: 11							X							X		
Nitrite by Kone (w)	All	NDPs: 0 Tests: 3	X							X							X	
pH Value	All	NDPs: 0 Tests: 10					X							X				
Phosphate by Kone (w)	All	NDPs: 0 Tests: 10					X							X				
Suspended Solids	All	NDPs: 0 Tests: 3					X							X				
TPH CWG (W)	All	NDPs: 0 Tests: 10			X							X						
VOC MS (W)	All	NDPs: 0 Tests: 10		X							X							X

Validated

CERTIFICATE OF ANALYSIS

SDG: 240717-88 **Report Number:** 735910 **Superseded Report:** 735908
Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

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

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Customer Sample Ref.			BH01	BH02	BH03	BH04	BH05	BH06
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
Sample Type			Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
Date Sampled			09/07/2024	09/07/2024	09/07/2024	09/07/2024	09/07/2024	09/07/2024
Sample Time			-	-	-	-	-	-
Date Received			15/07/2024	15/07/2024	15/07/2024	15/07/2024	15/07/2024	15/07/2024
SDG Ref			240717-88	240717-88	240717-88	240717-88	240717-88	240717-88
Lab Sample No.(s)			30091025	30091053	30091061	30091069	30091078	30091086
AGS Reference								
Component	**LOD/Units**	**Method**						
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2 #	<0.2 #	<0.2 #	<0.2 #	<0.2 #	<0.2 #
Ammoniacal Nitrogen as NH3	<0.2 mg/l	TM099	<0.2 #	<0.2 #	<0.2 #	<0.2 #	<0.2 #	<0.2 #
Fluoride	<0.5 mg/l	TM104	<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #
Aluminium (diss.filt)	<10 µg/l	TM152	<10 #	18.3 #	<10 #	11.1 #	<10 #	287 #
Arsenic (diss.filt)	<0.5 µg/l	TM152	<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #	0.789 #
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08 #	<0.08 #	<0.08 #	<0.08 #	<0.08 #	<0.08 #
Chromium (diss.filt)	<1 µg/l	TM152	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Copper (diss.filt)	<0.3 µg/l	TM152	2.77 #	0.455 #	2.18 #	1.28 #	4.25 #	16.5 #
Lead (diss.filt)	<0.2 µg/l	TM152	0.549 #	<0.2 #	0.452 #	<0.2 #	0.911 #	5.39 #
Nickel (diss.filt)	<0.4 µg/l	TM152	0.952 #	<0.4 #	0.566 #	<0.4 #	0.768 #	3.33 #
Zinc (diss.filt)	<1 µg/l	TM152	20.4 #	10.1 #	7.93 #	25.1 #	17.3 #	142 #
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	1.32 #	2.62 #	2.44 #	3.14 #	1.83 #	4 #
Iron (Dis.Filt)	<0.019 mg/l	TM152	0.033 #	<0.019 #	<0.019 #	<0.019 #	<0.019 #	0.191 #
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 2 #
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184	<0.05 #	<0.05 #	<0.05 #	<0.05 #	0.051 #	<0.05 #
Sulphate	<2 mg/l	TM184	<2 #	<2 #	<2 #	3.1 #	2.2 #	3.7 #
Chloride	<2 mg/l	TM184	3.7 #	7.8 #	4.3 #	12.5 #	9.5 #	9.5 #
Nitrate as NO3	<0.3 mg/l	TM184	2.88 #	4.62 #	6.43 #	10.8 #	2.78 #	5.11 #
pH	<1 pH Units	TM256	6.5 @ #	7.65 @ #	7.37 @ #	7.25 @ #	7.42 @ #	7.57 @ #
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256	0.162 #	0.415 #	0.535 #	0.495 #	0.312 #	0.473 #

10:27:03 26/07/2024

Validated

CERTIFICATE OF ANALYSIS

SDG: 240717-88 **Report Number:** 735910 **Superseded Report:** 735908
Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

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

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Customer Sample Ref.			BH07	SW1	SW2	SW3		
Depth (m)			0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
Sample Type			Ground Water (GW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
Date Sampled			09/07/2024	10/07/2024	10/07/2024	10/07/2024		
Sample Time			-	-	-	-		
Date Received			15/07/2024	15/07/2024	15/07/2024	15/07/2024		
SDG Ref			240717-88	240717-88	240717-88	240717-88		
Lab Sample No.(s)			30091094	30121807	30091110	30091044		
AGS Reference								
Component	**LOD/Units**	**Method**						
Suspended solids, Total	<2 mg/l	TM022		8.2 @ #	10.6 @ #	<2 @ #		
BOD, unfiltered	<1 mg/l	TM045		<1 @ #	<1 @ #	<1 @ #		
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2 #					
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		0.02 #	0.017 #	0.013 #		
Ammoniacal Nitrogen as NH3	<0.2 mg/l	TM099	<0.2 #					
Fluoride	<0.5 mg/l	TM104	<0.5 #					
Aluminium (diss.filt)	<10 µg/l	TM152	<10 #					
Arsenic (diss.filt)	<0.5 µg/l	TM152	0.546 #	0.527 #	<0.5 #	<0.5 #		
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08 #	<0.08 #	<0.08 #	<0.08 #		
Chromium (diss.filt)	<1 µg/l	TM152	<1 #	<1 #	<1 #	<1 #		
Copper (diss.filt)	<0.3 µg/l	TM152	13.4 #	0.753 #	0.628 #	0.474 #		
Lead (diss.filt)	<0.2 µg/l	TM152	2.98 #	0.428 #	0.36 #	<0.2 #		
Nickel (diss.filt)	<0.4 µg/l	TM152	3.79 #	0.623 #	0.634 #	0.467 #		
Selenium (diss.filt)	<1 µg/l	TM152		<1 #	<1 #	<1 #		
Zinc (diss.filt)	<1 µg/l	TM152	32.5 #	5.04 #	3.42 #	2.27 #		
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	8.7 #					
Iron (Dis.Filt)	<0.019 mg/l	TM152	<0.019 #					
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01 2 #	<0.01	<0.01	<0.01		
Nitrite as NO2	<0.05 mg/l	TM184		<0.25 #	<0.25 #	<0.05 #		
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184	<0.05 #	<0.1 #	<0.1 #	<0.05 #		
Sulphate	<2 mg/l	TM184	6.4 #	<10 #	<10 #	3.7 #		
Chloride	<2 mg/l	TM184	6 #	<10 #	<10 #	8.7 #		
Nitrate as NO3	<0.3 mg/l	TM184	0.38 #	<1.5 #	<1.5 #	6.46 #		
pH	<1 pH Units	TM256	7.1 @ #	6.71 @ #	6.88 @ #	8.23 @ #		
Conductivity @ 20 deg.C	<0.02 mS/cm	TM256	0.607 #	0.0458 #	0.05 #	0.331 #		
Alkalinity, Total as CaCO3	<3 mg/l	TM256		12.4 #	14.3 #	172 #		

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CERTIFICATE OF ANALYSIS

SDG: 240717-88 **Report Number:** 735910 **Superseded Report:** 735908

Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

PAH Spec MS - Aqueous (W)

Results Legend

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

Customer Sample Ref.			BH01	BH02	BH03	BH04	BH05	BH06
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
Sample Type			Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
Date Sampled			09/07/2024	09/07/2024	09/07/2024	09/07/2024	09/07/2024	09/07/2024
Sample Time			.	.	.	.	.	.
Date Received			15/07/2024	15/07/2024	15/07/2024	15/07/2024	15/07/2024	15/07/2024
SDG Ref			240717-88	240717-88	240717-88	240717-88	240717-88	240717-88
Lab Sample No.(s)			30091025	30091053	30091061	30091069	30091078	30091086
AGS Reference								
Component	**LOD/Units**	**Method**						
Naphthalene (aq)	<0.01 µg/l	TM178	<0.01 #	<0.01 @ #	<0.01 #	<0.02 @ #	<0.02 @ #	<0.01 @ #
Acenaphthene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 @ #	0.0159 #	<0.01 @ #	<0.01 @ #	<0.005 @ #
Acenaphthylene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 @ #	<0.005 #	<0.01 @ #	<0.01 @ #	<0.005 @ #
Fluoranthene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 @ #	<0.005 #	<0.01 @ #	<0.01 @ #	<0.005 @ #
Anthracene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 @ #	<0.005 #	<0.01 @ #	<0.01 @ #	<0.005 @ #
Phenanthrene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 @ #	<0.005 #	<0.01 @ #	<0.01 @ #	<0.005 @ #
Fluorene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 @ #	<0.005 #	<0.01 @ #	<0.01 @ #	<0.005 @ #
Chrysene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 @ #	0.0101 #	<0.01 @ #	<0.01 @ #	<0.005 @ #
Pyrene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 @ #	<0.005 #	<0.01 @ #	<0.01 @ #	<0.005 @ #
Benzo(a)anthracene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 @ #	<0.005 #	<0.01 @ #	<0.01 @ #	<0.005 @ #
Benzo(b)fluoranthene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 @ #	<0.005 #	<0.01 @ #	<0.01 @ #	<0.005 @ #
Benzo(k)fluoranthene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 @ #	<0.005 #	<0.01 @ #	<0.01 @ #	<0.005 @ #
Benzo(a)pyrene (aq)	<0.002 µg/l	TM178	<0.002 #	<0.002 @ #	<0.002 #	<0.004 @ #	<0.004 @ #	<0.002 @ #
Dibenzo(a,h)anthracene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 @ #	<0.005 #	<0.01 @ #	<0.01 @ #	<0.005 @ #
Benzo(g,h,i)perylene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 @ #	<0.005 #	<0.01 @ #	<0.01 @ #	<0.005 @ #
Indeno(1,2,3-cd)pyrene (aq)	<0.005 µg/l	TM178	<0.005 #	<0.005 @ #	<0.005 #	<0.01 @ #	<0.01 @ #	<0.005 @ #
PAH, Total Detected USEPA 16 (aq)	<0.082 µg/l	TM178	<0.082 #	<0.082 @ #	<0.082 #	<0.164 @ #	<0.164 @ #	<0.082 @ #

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CERTIFICATE OF ANALYSIS

SDG: 240717-88 **Report Number:** 735910 **Superseded Report:** 735908
Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

PAH Spec MS - Aqueous (W)

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

Customer Sample Ref.			BH07					
Depth (m)			0.00 - 0.00					
Sample Type			Ground Water (GW)					
Date Sampled			09/07/2024					
Sample Time			.					
Date Received			15/07/2024					
SDG Ref			240717-88					
Lab Sample No.(s)			30091094					
AGS Reference								
Component	**LOD/Units**	**Method**						
Naphthalene (aq)	<0.01 µg/l	TM178	0.105 @ #					
Acenaphthene (aq)	<0.005 µg/l	TM178	0.0786 @ #					
Acenaphthylene (aq)	<0.005 µg/l	TM178	<0.025 @ #					
Fluoranthene (aq)	<0.005 µg/l	TM178	<0.025 @ #					
Anthracene (aq)	<0.005 µg/l	TM178	<0.025 @ #					
Phenanthrene (aq)	<0.005 µg/l	TM178	<0.025 @ #					
Fluorene (aq)	<0.005 µg/l	TM178	<0.025 @ #					
Chrysene (aq)	<0.005 µg/l	TM178	0.0717 @ #					
Pyrene (aq)	<0.005 µg/l	TM178	<0.025 @ #					
Benzo(a)anthracene (aq)	<0.005 µg/l	TM178	<0.025 @ #					
Benzo(b)fluoranthene (aq)	<0.005 µg/l	TM178	<0.025 @ #					
Benzo(k)fluoranthene (aq)	<0.005 µg/l	TM178	<0.025 @ #					
Benzo(a)pyrene (aq)	<0.002 µg/l	TM178	<0.01 @ #					
Dibenzo(a,h)anthracene (aq)	<0.005 µg/l	TM178	<0.025 @ #					
Benzo(g,h,i)perylene (aq)	<0.005 µg/l	TM178	<0.025 @ #					
Indeno(1,2,3-cd)pyrene (aq)	<0.005 µg/l	TM178	<0.025 @ #					
PAH, Total Detected USEPA 16 (aq)	<0.082 µg/l	TM178	<0.41 @ #					

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CERTIFICATE OF ANALYSIS

SDG: 240717-88 **Report Number:** 735910 **Superseded Report:** 735908
Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

TPH CWG (W)

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

Component	LOD/Units	Method	BH01	BH02	BH03	BH04	BH05	BH06
Customer Sample Ref.			BH01	BH02	BH03	BH04	BH05	BH06
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
Sample Type			Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
Date Sampled			09/07/2024	09/07/2024	09/07/2024	09/07/2024	09/07/2024	09/07/2024
Sample Time			-	-	-	-	-	-
Date Received			15/07/2024	15/07/2024	15/07/2024	15/07/2024	15/07/2024	15/07/2024
SDG Ref			240717-88	240717-88	240717-88	240717-88	240717-88	240717-88
Lab Sample No.(s)			30091025	30091053	30091061	30091069	30091078	30091086
AGS Reference								
GRO Surrogate % recovery**	%	TM245	95	106	100	98	105	102
GRO >C5-C12 (HS_1D_TOTAL)	<50 µg/l	TM245	<50 #	<50 #	<50 #	<50 #	<50 #	<50 #
Aliphatics >C5-C6 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aliphatics >C6-C8 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aliphatics >C8-C10 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aliphatics >C10-C12 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aliphatics >C12-C16 (aq) (SPECD_AL1_W)	<10 µg/l	TM439	<100	<100	<50	<100	<10	<50
Aliphatics >C16-C21 (aq) (SPECD_AL2_W)	<10 µg/l	TM439	<100	<100	<50	<100	<10	<50
Aliphatics >C21-C35 (aq) (SPECD_AL3_W)	<10 µg/l	TM439	<100	<100	<50	<100	<10	<50
Total Aliphatics >C12-C35 (aq) (EPHAL12_35T_GC_W)	<10 µg/l	TM439	<100	<100	<50	<100	<10	<50
Aromatics >EC5-EC7 (HS_1D_AR)	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aromatics >EC7-EC8 (HS_1D_AR)	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aromatics >EC8-EC10	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aromatics >EC10-EC12	<10 µg/l	TM245	<10	<10	<10	<10	<10	<10
Aromatics >EC12-EC16 (aq) (SPECD_AROM1_W)	<10 µg/l	TM439	<100	<100	<50	<100	<10	<50
Aromatics >EC16-EC21 (aq) (SPECD_AROM2_W)	<10 µg/l	TM439	<100	<100	<50	<100	<10	<50
Aromatics >EC21-EC35 (aq) (SPECD_AROM3_W)	<10 µg/l	TM439	<100	<100	<50	<100	<10	<50
Total Aromatics >EC12-EC35 (aq) (EPHAR12_35T_GC_W)	<10 µg/l	TM439	<100	<100	<50	<100	<10	<50
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM439	<10	<10	<50	<100	<10	<50

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CERTIFICATE OF ANALYSIS

SDG: 240717-88 **Report Number:** 735910 **Superseded Report:** 735908
Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

TPH CWG (W)

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

Customer Sample Ref.			BH07	SW1	SW2	SW3		
Depth (m)			0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
Sample Type			Ground Water (GW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
Date Sampled			09/07/2024	10/07/2024	10/07/2024	10/07/2024		
Sample Time			.	.	.	.		
Date Received			15/07/2024	15/07/2024	15/07/2024	15/07/2024		
SDG Ref			240717-88	240717-88	240717-88	240717-88		
Lab Sample No.(s)			30091094	30121807	30091110	30091044		
AGS Reference								
Component	**LOD/Units**	**Method**						
GRO Surrogate % recovery**	%	TM245	109	102	105	108		
GRO >C5-C12 (HS_1D_TOTAL)	<50 µg/l	TM245	<50 #	<50 #	<50 #	<50 #		
Aliphatics >C5-C6 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10	<10		
Aliphatics >C6-C8 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10	<10		
Aliphatics >C8-C10 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10	<10		
Aliphatics >C10-C12 (HS_1D_AL)	<10 µg/l	TM245	<10	<10	<10	<10		
Aliphatics >C12-C16 (aq) (SPECD_AL1_W)	<10 µg/l	TM439	<50	<100	<20	<100		
Aliphatics >C16-C21 (aq) (SPECD_AL2_W)	<10 µg/l	TM439	<50	<100	<20	<100		
Aliphatics >C21-C35 (aq) (SPECD_AL3_W)	<10 µg/l	TM439	2120	<100	<20	<100		
Total Aliphatics >C12-C35 (aq) (EPHAL12_35T_GC_W)	<10 µg/l	TM439	2120	<100	<20	<100		
Aromatics >EC5-EC7 (HS_1D_AR)	<10 µg/l	TM245	<10	<10	<10	<10		
Aromatics >EC7-EC8 (HS_1D_AR)	<10 µg/l	TM245	<10	<10	<10	<10		
Aromatics >EC8-EC10	<10 µg/l	TM245	<10	<10	<10	<10		
Aromatics >EC10-EC12	<10 µg/l	TM245	<10	<10	<10	<10		
Aromatics >EC12-EC16 (aq) (SPECD_AROM1_W)	<10 µg/l	TM439	<50	<100	<20	<100		
Aromatics >EC16-EC21 (aq) (SPECD_AROM2_W)	<10 µg/l	TM439	<50	<100	<20	<100		
Aromatics >EC21-EC35 (aq) (SPECD_AROM3_W)	<10 µg/l	TM439	109	<100	<20	<100		
Total Aromatics >EC12-EC35 (aq) (EPHAR12_35T_GC_W)	<10 µg/l	TM439	109	<100	<20	<100		
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM439	2230	<10	<10	<10		

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CERTIFICATE OF ANALYSIS

SDG: 240717-88 **Report Number:** 735910 **Superseded Report:** 735908
Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

VOC MS (W)

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

Customer Sample Ref.			BH01	BH02	BH03	BH04	BH05	BH06
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
Sample Type			Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
Date Sampled			09/07/2024	09/07/2024	09/07/2024	09/07/2024	09/07/2024	09/07/2024
Sample Time			-	-	-	-	-	-
Date Received			15/07/2024	15/07/2024	15/07/2024	15/07/2024	15/07/2024	15/07/2024
SDG Ref			240717-88	240717-88	240717-88	240717-88	240717-88	240717-88
Lab Sample No.(s)			30091025	30091053	30091061	30091069	30091078	30091086
AGS Reference								
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 #
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 #	<1 #
o-Xylene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Sum of detected Xylenes	<2 µg/l	TM208	<2	<2	<2	<2	<2	<2
Sum of BTEX	<5 µg/l	TM208	<5	<5	<5	<5	<5	<5

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CERTIFICATE OF ANALYSIS

SDG: 240717-88 **Report Number:** 735910 **Superseded Report:** 735908
Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

VOC MS (W)

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

Customer Sample Ref.			BH07	SW1	SW2	SW3		
Depth (m)			0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
Sample Type			Ground Water (GW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
Date Sampled			09/07/2024	10/07/2024	10/07/2024	10/07/2024		
Sample Time			.	.	.	.		
Date Received			15/07/2024	15/07/2024	15/07/2024	15/07/2024		
SDG Ref			240717-88	240717-88	240717-88	240717-88		
Lab Sample No.(s)			30091094	30121807	30091110	30091044		
AGS Reference								
Component	**LOD/Units**	**Method**						
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #		
Benzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #		
Toluene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #		
Ethylbenzene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #		
m,p-Xylene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #		
o-Xylene	<1 µg/l	TM208	<1 #	<1 #	<1 #	<1 #		
Sum of detected Xylenes	<2 µg/l	TM208	<2	<2	<2	<2		
Sum of BTEX	<5 µg/l	TM208	<5	<5	<5	<5		

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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
TM099	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Determination of Fluoride using the Kone Analyser
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM245	Determination of GRO by Headspace in waters
TM152	Analysis of Aqueous Samples by ICP-MS
TM208	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM178	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM439	Determination of Extractable Petroleum Hydrocarbons (EPH) CWG banding by GC-FID on liquids

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NA = not applicable.

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

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CERTIFICATE OF ANALYSIS

SDG: 240717-88 **Report Number:** 735910 **Superseded Report:** 735908
Client Ref.: 501.065477.00001 **Location:** Mounthall Co. Laois

Test Completion Dates

Lab Sample No(s)	30091025	30091053	30091061	30091069	30091078	30091086	30091094	30121807	30091110	30091044
Customer Sample Ref.	BH01	BH02	BH03	BH04	BH05	BH06	BH07	SW1	SW2	SW3
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	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Surface Water	Surface Water	Surface Water
Ammoniacal Nitrogen	25-Jul-2024	25-Jul-2024	25-Jul-2024	25-Jul-2024	25-Jul-2024	25-Jul-2024	25-Jul-2024			
Ammonium Low								25-Jul-2024	25-Jul-2024	25-Jul-2024
Anions by Kone (w)	24-Jul-2024	24-Jul-2024	24-Jul-2024	24-Jul-2024	24-Jul-2024	24-Jul-2024	24-Jul-2024	24-Jul-2024	24-Jul-2024	24-Jul-2024
BOD True Total								24-Jul-2024	24-Jul-2024	24-Jul-2024
Dissolved Metals by ICP-MS	23-Jul-2024	25-Jul-2024	22-Jul-2024	22-Jul-2024	23-Jul-2024	23-Jul-2024	23-Jul-2024	22-Jul-2024	22-Jul-2024	23-Jul-2024
EPH and CWG by FID	26-Jul-2024	26-Jul-2024	25-Jul-2024	25-Jul-2024	25-Jul-2024	26-Jul-2024	26-Jul-2024	26-Jul-2024	25-Jul-2024	26-Jul-2024
Fluoride	19-Jul-2024	18-Jul-2024	19-Jul-2024	19-Jul-2024	19-Jul-2024	19-Jul-2024	19-Jul-2024			
GRO by GC-FID (W)	19-Jul-2024	19-Jul-2024	19-Jul-2024	19-Jul-2024	19-Jul-2024	19-Jul-2024	19-Jul-2024	22-Jul-2024	22-Jul-2024	22-Jul-2024
Mercury Dissolved	23-Jul-2024	23-Jul-2024	23-Jul-2024	23-Jul-2024	23-Jul-2024	23-Jul-2024	23-Jul-2024	23-Jul-2024	23-Jul-2024	23-Jul-2024
Nitrite by Kone (w)	18-Jul-2024	18-Jul-2024	18-Jul-2024	18-Jul-2024	18-Jul-2024	18-Jul-2024	18-Jul-2024	18-Jul-2024	18-Jul-2024	18-Jul-2024
PAH Spec MS - Aqueous (W)	23-Jul-2024	23-Jul-2024	23-Jul-2024	23-Jul-2024	23-Jul-2024	23-Jul-2024	23-Jul-2024			
pH Value	24-Jul-2024	24-Jul-2024	24-Jul-2024	24-Jul-2024	24-Jul-2024	24-Jul-2024	24-Jul-2024	25-Jul-2024	25-Jul-2024	25-Jul-2024
Phosphate by Kone (w)	18-Jul-2024	18-Jul-2024	18-Jul-2024	18-Jul-2024	18-Jul-2024	18-Jul-2024	23-Jul-2024	18-Jul-2024	18-Jul-2024	18-Jul-2024
Suspended Solids								24-Jul-2024	24-Jul-2024	24-Jul-2024
TPH CWG (W)	26-Jul-2024	26-Jul-2024	25-Jul-2024	25-Jul-2024	25-Jul-2024	26-Jul-2024	26-Jul-2024	26-Jul-2024	25-Jul-2024	26-Jul-2024
VOC MS (W)	19-Jul-2024	19-Jul-2024	19-Jul-2024	19-Jul-2024	19-Jul-2024	19-Jul-2024	19-Jul-2024	22-Jul-2024	23-Jul-2024	23-Jul-2024

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Appendix

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

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

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19. **Sample Deviations**

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

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

20. **Asbestos**

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

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

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

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

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

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Appendix 7-G
Rating of Existing Environment Significance / Sensitivity

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Rating of Existing Environment Significance / Sensitivity (IGI, 2013 Guidelines)

Importance	Criteria	Typical Example
High	Attribute has a high quality or value on an international scale	Groundwater/ Surface Water supports river, wetland or surface water body ecosystem protected by EU legislation e.g. SAC or SPA status
	Attribute has a high quality or value on a regional or national scale	Regionally Important Aquifer with multiple wellfields. Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – e.g. NHA status. Regionally important potable water source supplying >2,500 homes Inner source protection area for regionally important water source. Drinking water supply from river. Amenity use of waterbody
	Attribute has a high quality or value on a local scale	Regionally Important Aquifer. Groundwater provides large proportion of baseflow to local rivers. Locally important potable water source supplying >1000 homes. Outer source protection area for regionally important water source. Inner source protection area for locally important water source.
Medium	Attribute has a medium quality or value on a local scale	Locally Important Aquifer Potable water source supplying >50 homes. Outer source protection area for locally important water source. No specific recreational use of waterbody
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer. Potable water source supplying <50 homes. No water supply from surface water, no abstraction designation for watercourse No amenity value of waterbody
Negligible	Attribute has negligible quality or	No groundwater supply from a bedrock aquifer inn vicinity of site.

	value on a local site scale	Surface water not used for any specific purpose.

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Appendix 7-H
Descriptions of Effects (EPA, 2022)

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Descriptions of Effects (EPA, 2022)

Impact Characteristic	Term	Description
Quality of Effects	Positive Effects	A change which improves the quality of the environment
	Neutral Effects	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error
	Negative / Adverse Effects	A change which reduces the quality of the environment
Describing the Significance of Effects	Imperceptible	An effect capable of measurement but without significant consequences
	Not significant	An effect which causes noticeable2 changes in the character of the environment but without significant consequences.
	Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
	Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
	Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound Effects	An effect which obliterates sensitive characteristics
Describing the Extent and Context of Effects	Extent	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect
	Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
Describing the Probability of Effects	Likely Effects	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.

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	Unlikely Effects	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
Describing the Duration and Frequency of Effects	Momentary Effects	Effects lasting from seconds to minutes
	Brief Effects	Effects lasting less than a day
	Temporary Effects	Effects lasting less than a year
	Short-term Effects	Effects lasting one to seven years
	Medium-term Effects	Effects lasting seven to fifteen years
	Long-term Effects	Effects lasting fifteen to sixty years
	Permanent Effects	Effects lasting over sixty years
	Reversible Effects	Effects that can be undone, for example through remediation or restoration
	Frequency of Effects	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually.
Describing the Types of Effects	Indirect / Secondary Effects	Likely, significant effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative Effects	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	Do-Nothing Effects	The environment as it would be in the future should the subject project not be carried out.
	Worst Case Effects	The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable Effects	When the full consequences of a change in the environment cannot be described.
	Irreversible Effects	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.

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	Residual Effects	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects	Where the resultant effect is of greater significance than the sum of its constituents, (e.g. combination of SOx and NOx to produce smog).

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Appendix 7-I
Classification of the Significance of Impacts

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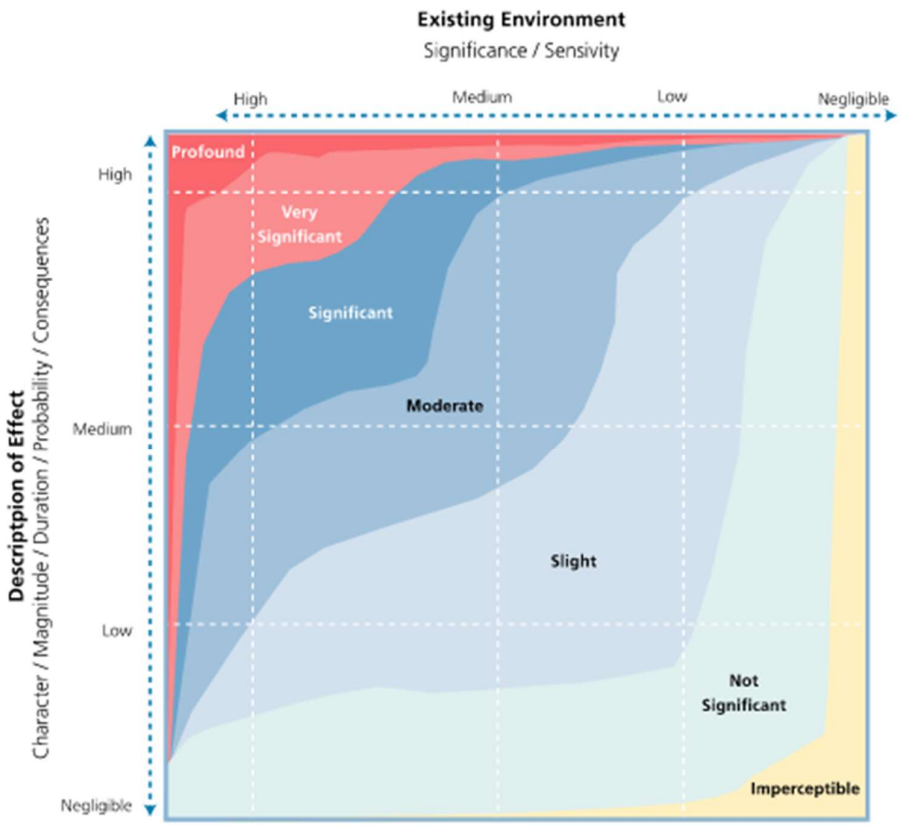
Determining Significance

Figure 3.4 shows how comparing the character of the predicted effect to the sensitivity of the receiving environment can determine the significance of the effect.



There are seven generalised degrees of effect significance that are commonly used in EIA. Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant and Profound. Generalised definitions of each of these are provided in Table 3.4. When more specific definitions exist within a specialised factor or topic, e.g. biodiversity, these should be used in preference to these generalised definitions. (ref. Advice Notes[68].)

(Source: Figure 3.4 Environmental Protection Agency (May 2022), *'Guidelines on the Information to be contained in Environmental Impact Assessment Reports'*).

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EIAR Extract

Chapter 8 Air Quality

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Introduction

Background

8.1 This Chapter of the Environmental Impact Assessment Report (EIAR), prepared by SLR Consulting Ireland, addresses the potential effects of the proposed continued use and extension of the sand and gravel pit on air quality. The existing pit is located at Mounthall and Cummer townlands, Camross, Co. Laois.

8.2 The proposed development being applied for under this planning application will consist of:

- Continued use and extension to existing permitted sand and gravel pit registered under Section 261 of the Planning & Development Act 2000, as amended (site ref. QY05/10) within an overall application area of c. 12.2 hectares;
- Extraction of sand and gravel (dry working) over an area of c. 8 hectares with processing and washing of material on site (closed loop water recycling system with associated silt storage lagoons 1,952.25m^2), and all ancillary works and structures;
- Site facilities consisting of mobile processing plant, portacabin site office (6.25m^2), portacabin welfare facility (18.9m^2), serviced portaloo toilet, bunded fuel storage and refuelling pad with hydrocarbon interceptor, weighbridge, wheelwash, water supply borehole, perimeter berms, vegetation planting and fencing;
- Access to the site will be via the existing sand & gravel pit entrance;
- Restoration of the site to agricultural lands; and
- The proposed extraction operational period is for 10 years plus 1 year to complete restoration (total duration sought 11 years).

8.3 Further details on the proposed development, site activities, environmental management systems and controls at the application sites are provided in the Chapter 2 of this EIAR.

8.4 The UK Institute of Air Quality Management (IAQM) 2016 Guidance on the Assessment of Mineral Dust Impacts for Planning notes that *"Dust arising from the quarry can reduce amenity in the local community due to visible dust plumes and dust soiling. The generally coarser dust that leads to these effects may, therefore, be referred to as 'disamenity dust'. The smaller dust particles can remain airborne longer, potentially increasing local ambient concentrations of suspended particulate matter (e.g. PM_{10} and to a lesser extent $PM_{2.5}$), which is associated with a range of health effects. This guidance uses PM_{10} as the health indicator of airborne particles to be consistent with national Planning Practice Guidance (nPPG5) for mineral sites. Mineral site impacts are more likely to be associated with coarse particulate matter (i.e. PM_{10})."*

8.5 The guidance further notes *"As noted earlier, the PM_{10} fraction is relevant to health outcomes. For quarries most of this suspended dust will be in the coarse sub-fraction ($PM_{2.5-10}$), rather than in the fine ($PM_{2.5}$) fraction."* It is on this basis that only PM_{10} is considered further in this assessment.

8.6 The proposed development at Mounthall and Cummer townlands will have the potential to generate fugitive dust emissions and particulates (PM_{10}), which may result in impacts on local air quality. Combustion emissions (primary PM_{10}, and oxides of nitrogen) from vehicle exhaust emissions associated with the extraction and transportation of aggregates may also have the potential to impact on local air pollution.

8.7 The proposed development will have an average annual extraction rate of c. 80,000 tonnes per year. Based on this output level the proposed development will generate an average of

c. 24 HGV trips per day (i.e. 12 loads per day). The development will also generate some light vehicular traffic, principally by employees and visitors travelling to and from the site. This equates to an average of 12 staff and visitor light vehicle trips daily.

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Scope of Work

8.8 The focus of this assessment is the potential impact on local residential amenity of fugitive dust emissions and particulate matter generated by the proposed development.

8.9 The principal air quality impact associated with the proposed development through deposition on land is fugitive dust emission. Dust emissions are likely to arise during the following activities:

- soil stripping, earthworks, and topsoil stockpiling (site preparation and restoration works);
- handling and processing of excavated sand and gravel;
- transfer, end-tipping and stockpiling of aggregates;
- trafficking by heavy goods vehicles (HGVs) over paved / unpaved surfaces; and
- landscaping and final restoration activities.

8.10 With respect to the potential for air quality impacts, the key objective at the application site is to manage activities to ensure that air emissions are prevented where possible, and the effects of any residual releases are minimised.

8.11 This EIAR chapter describes and assesses the existing air quality baseline characteristics of the area at and around the application site based on site specific surveys and EPA data. Impacts on air quality arising from the proposed development are assessed. Mitigation measures are identified where required, to eliminate and reduce these impacts insofar as practical.

8.12 The following sections of this chapter describe the potential air quality impacts associated with the planned development activities. The following issues are addressed separately:

- relevant legislation, standards, and guidance;
- methodology used to assess the potential impacts of planned activities on air quality at local properties (sensitive receptors);
- baseline conditions pertaining to measured (or estimated) existing air quality levels around the existing sand and gravel pit footprint;
- assessment of the impacts;
- description of mitigation measures that are incorporated into the construction, design and operation of the proposed development to eliminate or reduce the potential for increased air quality impacts (if required);
- summary of any residual impacts;
- summary of cumulative impacts; and
- monitoring proposals.

Consultations / Consultees

8.13 A formal pre-planning consultation meeting was held online between officials of Laois County Council, SLR and the Applicant on the 1st May 2024.

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8.14 A pre-planning consultation document was issued to 13 no. statutory consultees which included the EPA, An Taisce, the HSE and the Heritage Council. The full list of statutory consultees and summaries of their responses is provided in Chapter 1, sections 1.33 to 1.40 and **Table 1-1**.

8.15 Feedback of most relevance to the assessment of air quality was received from the Health Service Executive (HSE) Environmental Health Department who made the following comments in their consultation response:

"Due to the nature of the proposed works, generation of airborne dust has the potential to have significant impacts on sensitive receptors.

Dust control and mitigation measures should be included in the EIAR and measures should include:

- *Sweeping of hard road surfaces*
- *Provision of a water bowser on site, regular spraying of haul roads*
- *Wheel washing facilities at site exit*
- *Restrict speed on site*
- *Provide covers to all delivery trucks to minimise dust generation*
- *Inspect and clean public roads in the vicinity if necessary*
- *Material stockpiling provided with adequate protection from the wind*
- *Dust monitoring at the site boundary*
- *Truck inspection and maintenance plan*
- *Details of a road maintenance agreement between the operator and the Local Roads Authority to clarify responsibility for the upkeep and repair of access roads during the construction phase of the project.*

8.16 Details of the range of mitigation measures to be implemented at the site are provided later in the chapter. In addition, it is standard practice for Local Planning Authorities to impose a condition in relation to a financial payment to the Local Authority for the upkeep and maintenance of local public roads.

8.17 In addition, consultation has been undertaken directly with EIA specialist contributors such as ecology in the preparation of the air quality assessment.

8.18 Following this, and a review of published development plans / site surveys, it was considered that there was no requirement for any further formal external consultations to be carried out in respect of air quality for the purposes of this assessment. There was however significant consultation with other specialist contributors to this EIA Report.

Contributors / Author(s)

8.19 The air quality impact assessment presented in this Chapter was prepared by SLR Consulting Ireland. The lead consultant for the study was Hannah McGurran BSc. Environmental Science and Conor Hughes MSc. Energy Science. A review was carried out by Shane McDermott BSc (Hons) MSCSI MRICS.

Limitations / Difficulties Encountered

8.20 This assessment is compiled based on published regional and local data, guidance documents, and site-specific field surveys. No difficulties were encountered in compiling the required information.

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Regulatory Background

8.21 The following sections describe the main legislative policy requirements in respect of air quality associated with the proposed development.

Legislation

Air Quality Standards

8.22 The Government's policy on air quality within Ireland is set out in the Air Quality Standards (AQS) Regulations 2011. The CAFE Directive was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011). It replaces the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and the EPA Act 1992 (Ambient Air Quality Assessment and Management) Regulations 1999 (S.I. No. 33 of 1999). The 4th Daughter Directive was transposed by the Arsenic, Cadmium, Mercury, Nickel, and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations 2009 (S.I.no. 58 of 2009).

8.23 The AQS sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in Ireland.

8.24 The AQS sets standards and objectives for ten priority pollutants. Standards establish concentrations of pollutants in the atmosphere which can broadly be taken to provide a certain level of environmental quality. Objectives are policy targets, often expressed as maximum concentrations, not to be exceeded (either without exception, or with a limited number of exceedances within a specified timescale).

8.25 Under the AQS, the following pollutants are monitored and controlled:

- nitrogen oxides;
- sulphur dioxide;
- carbon monoxide;
- ozone;
- particulate matter (PM_{10}, $PM_{2.5}$ and black smoke);
- benzene and volatile organic compounds;
- heavy metals; and
- polycyclic aromatic hydrocarbons.

8.26 A summary of relevant air quality limit values typically associated with aggregate extraction and associated HGV traffic in relation to human health are presented in **Table 8-1**[1]. Air quality limit values in relation to vegetation protection are presented separately in **Table 8-2**: Summary of Air Quality Limit Values: Protection of Vegetation.

8.27 The air quality monitoring network is coordinated and managed by the EPA, as the National Reference Laboratory for air quality. The EPA co-ordinates and manages a nationwide network of over 110 monitoring stations which measures the levels of air pollutants and delivers this information to the public. The EPA is finalising the National Ambient Air Quality Monitoring Programme, which involves a greatly expanded national monitoring network

[1] Of the five key pollutants with emission ceilings (limits) for which Ireland has compliance commitments under the National Emissions Ceiling Directive (Directive (EU) 2016/22843.[Sulphur Dioxide (SO_2), Nitrogen Oxides (NO_X), Ammonia (NH_3), Non-Methane Volatile Organic Compounds(NMVOCs) and Fine Particulate Matter ($PM_{2.5}$), those listed in Table 8-1 are likely to be closely associated with the extractive industry.

providing enhanced real-time information to the public, as well as an increased local authority capacity to conduct indicative air monitoring. The results of the monitoring are compared to limit values set out in EU and national legislation on ambient air quality. Map-based assessments of air quality are prepared and published by the EPA.

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Table 8-1: Relevant Air Quality Limit Values for Protection of Human Health[2]

Human Health	Limit or Target Value			Information and Alert Thresholds (where applicable)		Long Term Objective
Pollutant	Averaging Period	Value	Maximum Number of Allowed Occurrences	Period	Threshold Value	
Nitrogen Dioxide (NO_2)	Hour	200 µg/m³	18	1 hour alert	400 µg/m³ Exceeded for 3 consecutive hours	
	Year	40 µg/m³	0			
Sulphur Dioxide (SO_2)	Hour	350 µg/m³	24	1 hour alert	500 µg/m³ Exceeded for 3 consecutive hours	
	Day	125 µg/m³	3			
Particulate matter with aerodynamic diameter of less than 10 µm (PM_{10})	Day	50 µg/m³	35			
	Year	40 µg/m³	0			
		20 µg/m³ (ECO)				

Table 8-2: Summary of Air Quality Limit Values: Protection of Vegetation[3]

Vegetation		Critical level or Target Value		Long-term Objective
Pollutant	Averaging Period	Value	Value	Date
Nitrogen dioxide (NOx)	Calendar year	30 µg/m³		
Sulphur Dioxide (SO_2)	Calendar year and winter (October to March)	20 µg/m³		

[2] World Health Organisation (WHO) Air Quality Guidelines & Advice Note (IAN) prepared as a supplement for Volume 11, Section 3, Part 1 of the UK DMRB (Design Manual for Roads and Bridges) and now incorporated into HA 207/07)
[3] Institute of Air Quality Management (IAQM) 2019 A guide to the assessment of air quality impacts on designated nature conservation sites

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Planning Policy and Development Control

National Spatial Strategy (NSS) / National Planning Framework – Project Ireland 2040

8.28 The National Planning Framework 2040[4] (published in February 2018) is a national planning framework for Ireland. The framework provides the policies for all regional and local plans. In the framework, the extractive industries are recognised as important for the supply of aggregates and construction materials to variety of sectors. It emphasises that the planning process will play a key role in realising the potential of the extractive industries and protecting reserves of aggregates and minerals. Aggregates and minerals will continue to be enabled where this is compatible with protection of the environments.

8.29 There are no specific policies in relation to air emissions in the NPF for extractive or production of construction aggregates and materials. The general objective is to facilitate development and to protect the environment at the same time. The air quality objectives assessed according to industry accepted methodology for EIA in extractive development are identified in **Table 8-1**.

Local Planning Policy – Laois County Development Plan 2021 – 2027

8.30 The current Laois County Development Plan (CDP) sets out policy in relation to management of air pollution:

"The Council has adopted policies in relation to air quality having regard to its importance to a good quality of life, public health and environmental sustainability. Air pollution can negatively affect human health and eco-systems with the main threat to air quality being emissions from road traffic and solid fuel burning. The policy approach of the Council to integrate land use planning and transportation will reduce emissions from vehicles."

8.31 The CDP contains the following policy objectives in relation to air quality:

"To seek to preserve and maintain air and noise quality in the county in accordance with good practice and relevant legislation."

- **ES38** *"Promote the preservation of best ambient air quality compatible with sustainable development in accordance with the EU Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC) and ensure that all air emissions associated with new developments are within Environmental Quality Standards as out in the Air Quality Standards Regulations 2011 (SI No. 180 of 2011) (or any updated/superseding documents)."*
- **ES39** *"Encourage more sustainable modes of transport and a more balanced modal spilt to reduce carbon emissions."*
- **ES40** *"Encourage the use of appropriate mitigation measures, such as dust dampeners, chimney stack scrubbers, etc. to minimise the potential impacts of developments on air quality."*
- **ES41** *"Require developments of a certain nature to carry out assessments of the impact of the development on air quality."*
- **ES42** *"Ensure the implementation of the radon prevention measures for new homes as contained within the Building Regulations."*

[4] Draft First Revision to the National Planning Framework (issued July 2024)

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Guidelines Extractive Industry Emissions Limit Values

8.32 Section 261 of the Planning and Development Act 2000 (as amended), which regulated a significant proportion of established extractive development, came into effect in April 2004. The planning guidelines[5] for the extractive industries ***'Quarries and Ancillary Activities – Guidelines for Planning Authorities'*** were published by the Department of the Environment, Heritage, and Local Government at around the same time.

8.33 Separately, in 2006, the EPA published complementary guidance aimed at quarry operators, planning authorities and the general public ***Environmental Management Guidelines for Environmental Management in the Extractive Industry (Non-Scheduled Minerals)***[6].

8.34 The Irish Concrete Federation (ICF), the trade body representing the interests of quarry operators and producers of construction materials, has also published the ICF Environmental Code to provide guidance for its members on best practice in the environmental management of quarries. The document was last updated in 2005.

Site Specific Dust Deposition Emission Limit Values

8.35 Condition 5 attached to the Section 261A conditions imposed on the site (Ref. Q05/10) states:

"Activities at the site shall not give rise to total dust deposition of greater than 350mg/m² per day monthly mean in accordance with TA Luft VDI Method 2119 (Bergerhoff Gauge), measured at dust sensitive locations details of which shall be submitted to the Planning Authority for agreement and approval within 6 months of the date of this order. A map showing the location of the dust monitors shall be submitted to the Planning Authority for approval."

Reason*: To protect the amenities of the properties in the vicinity of the area.*

Guidance Relating to Air Quality / Dust Nuisance

8.36 A range of monitoring techniques exists for dust deposition rates (i.e., Bergerhoff and Frisbee gauges). There is currently no Irish, European Union (EU) or World Health Organisation (WHO) statutory standards or limits appropriate for the assessment of deposited dust and its propensity to generate annoyance.

8.37 Industry standard criteria levels for the gravimetric assessment of dust deposition from extractive industry in Ireland are set out in the DoEHLG (2004) planning guidelines for the extractive industry, the ICF Guidelines (2005) and EPA (2006) Environmental Management Guidelines. Each of these Guidelines recommend the use of the Bergerhoff method for measuring dust deposition. In line with this approach, the guidelines recommend the TA Luft dust deposition limit value of 350 mg/m^2/day (total dust deposition averaged over a 30-day period), measured at site boundaries.

8.38 When the rate of accumulation of the coarser fraction of dust (referred to as deposited dust) is sufficiently rapid to cause fouling or discolouration, then it is generally considered to introduce a nuisance. The point at which an individual perceives dust deposition as a nuisance and causes a complaint is highly subjective.

8.39 The action of wind over dry ground will carry dust particles into the air. Although large emissions of dust occur naturally, man-made dust events are caused by a range of activities including agriculture, road traffic, construction works (including the handling and storage of soils and particulate matter) and by vehicles using paved and unpaved haul roads.

[5] Quarries and Ancillary Activities – Guidelines for Planning Authorities (DoEHLG, 2004)
[6] https://www.epa.ie/pubs/advice/general/EPA_management_extractive_industry.pdf

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8.40 For operations involving the mechanical break up of solids, the most common concern regarding dust emissions is the potential annoyance effect from the larger fractions of dust.

Guidance on Assessment of Mineral Dust Impacts for Planning

8.41 Guidance on the assessment of the impacts of extractive operations on air quality has been prepared by the Institute of Air Quality Management (IAQM, 2016)[7]. This guidance uses a simple distance-based screening process to identify those operations where the dust impacts are unlikely to be significant and therefore require no further assessment. Where more detailed assessment is required, a basic assessment framework is presented which employs the Source-Pathway-Receptor approach to evaluate risk of impacts and effects.

Air Quality and Ecological Receptors

8.42 Much of the research on the effects of particulate matter on vegetation has focussed on the chemical effects of alkaline dusts. A summary of a review of available research on behalf of the UK's Department for the Environment Transport and Regions (DETR) concluded that:

"The issue of dust on ecological receptors is largely confined to the associated chemical effect of dust, and particularly the effect of acidic or alkaline dust influencing vegetation through soils."

8.43 An Interim Advice Note (IAN) prepared as a supplement for Volume 11, Section 3, Part 1 of the UK DMRB (Design Manual for Roads and Bridges) and now incorporated into HA 207/07) suggests that only dust deposition levels above 1,000 mg/m^2/day are likely to affect sensitive ecological receptors. This level of dust deposition is approximately five times greater than the level at which most dust deposition may start to cause a perceptible nuisance to humans. It states that most species appear to be unaffected until dust deposition rates are at levels considerably higher than this.

8.44 Guidance on the assessment of the air quality impacts of development on designated nature conservation sites prepared by the Institute of Air Quality Management (IAQM, 2019). This guidance is also useful to evaluate the effects of air pollution on habitats and species using air quality assessment.

8.45 The predicted scale of dust effects may be classified as either 'significant', or 'not significant'. Where effects are predicted to be 'significant', further mitigation is likely required before the proposals are to be acceptable under planning policy.

Air Quality and Health Effects

8.46 The main health effects of air pollution can include stroke, heart disease, lung cancer, and both chronic and acute respiratory diseases, including asthma. These conditions can lead to sickness and ill health as well as premature mortality.

8.47 Two recent EPA reports, *Air Quality in Ireland 2022*[8] and *Ireland's Environment, An Assessment 2020*[9] detail the main air quality trends based on monitoring from the national ambient air quality network. There are monitored exceedances of the WHO guideline values for ozone, NO_2, SO_2, PM_{10} and $PM_{2.5}$ at several sites, though there are no current exceedances of the lower (less protective) EU standards at the existing monitoring locations in Ireland. The reports also highlight the main challenges of reducing air pollution from key

[7] http://www.iaqm.co.uk/text/guidance/mineralsguidance_2016.pdf

[8] Environmental Protection Agency, Air Quality in Ireland 2022. Available at: https://www.epa.ie/publications/monitoring assessment/air/Air_Quality_Report_22_v8v2.pdf

[9] Environmental Protection Agency, Ireland's Environment, An Assessment 2020. Available at: State of the Environment | Environmental Protection Agency (epa.ie)

sources such as particulate matter emissions from solid fuel burning (e.g., peat, coal, and wood) in the residential sector and NOx emissions from vehicles in the transport sector.

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8.48 Europe as part of the Green Deal and the EU's Zero pollution visions for 2050 is revising its air quality standards to align them closely with the lower WHO recommendations.

8.49 A summary of relevant Air Quality limit values normally associated with aggregate extraction and associated HGV traffic in relation to human health was presented previously in **Table 8-1.**

Receiving Environment

Study Area

8.50 The lands surrounding and within the application site predominantly comprise agricultural fields with the exception of the existing sand and gravel pit. There are isolated private residential property and agriculture farms located throughout the surrounding rural landscape, predominantly along the local road network.

8.51 Two local roads bound the application site. The L1031 local road borders its southeastern boundary and the L10317 local road to the east and northeast. Access to the existing pit is via the L10317 local road. A drainage channel bounds the southern application site, flowing east for c. 150m alongside the L1031 local road before it enters the Killeen stream.

8.52 The application site is not subject to any statutory or non-statutory nature conservation designations. The Slieve Bloom SPA (site code 004160) bounds the northern boundary of the existing sand and gravel pit with the proposed extension area to develop away from this SPA. The Slieve Bloom SAC (site code 000412) is located c. 1.5km to the north at its closest point and the River Barrow & River Nore SAC is c. 2km to the east.

8.53 Dwellings in the vicinity of application site are generally located along the local road network comprise farmsteads or isolated on-off residences, with occasional small clusters. The nearest dwellings to the application site boundary are shown in **Figure 8-1**. There are c. 20 residences located within 500m of the application boundary, with a further c. 30 residences between 500m and 1km.

Baseline Study Methodology

Baseline Dust Monitoring

8.54 Baseline dust monitoring has been undertaken by SLR Consulting Ireland. Two rounds of monitoring were undertaken at four monitoring points within the planning application boundary as shown on **Figure 8-1** (see below). The monitoring method utilised was the 'Bergerhoff method' referred to in the TA Luft Air Quality Standard. The 'Bergerhoff' dust deposition gauge used in the survey comprises a plastic collection bottle with protective basket, mounted on a post and set at 1500 mm above ground level. The input of atmospheric borne particulate material into the collection bottle takes place over a pre-determined measurement period (usually one month) by exposing it to the environment. The total dust collected in the bottle is expressed as deposition of total particulate matter (mg/m^2/day) arising from human activity in the area surrounding the application site.

PM_{10} Monitoring

8.55 The application site and surrounding area fall into Air Quality Zone D, categorised as rural Ireland by the EPA. An active PM_{10} air quality monitoring location within a similar Zone D area is located at Birr, Co. Offaly, c. 20km west of the application site, since 2020. As such,

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it is considered an appropriate dataset available for assessment of air quality baseline concentrations within the study area.

Sources of Information

8.56 A desk study was carried out to examine all relevant information relating to air quality conditions around the application site. Met Eireann, the National Meteorological Service, was consulted in relation to the climate / weather data in respect of the study area (Birr synoptic weather station 1979–2008 averages (met.ie)[10]. The EPA website was examined to note information on baseline air monitoring data around the application site (http://www.epa.ie/air/quality/data/).

8.57 Information published on its website by the National Parks and Wildlife Service (NPWS) (http://webgis.npws.ie/npwsviewer/), (part of the Department of the Environment, Community and Local Government, DoECLG), in respect of designated ecological sites, protected habitats and species was also reviewed, together with Ordnance Survey maps and aerial photography (http://map.geohive.ie/mapviewer.html).

Field Survey / Monitoring / Inspection Works

8.58 Baseline dust deposition surveys were undertaken at and around the application site by SLR Consulting Ireland, at 4 no. monitoring locations. The dust deposition monitoring results recorded over this period are presented and reviewed as part of this assessment. A survey of the extent of existing residential housing around the application site was also undertaken.

8.59 The locations of baseline dust deposition monitors are shown on **Figure 8-1** are as follows:

- **D1** – located at the northern application site boundary;
- **D2** – located at the north-eastern application site boundary adjacent to residence R1;
- **D3** –located at the south-eastern application site boundary adjacent to residence R3;
- **D4** –located at the south-western application site boundary.

Background Air Quality

8.60 As previously noted, the closest air quality monitoring location to the application site in a similar Zone D area is located at Birr, Co. Offaly, c. 20km west. Monitoring stations continuously monitor concentrations of particulate matter with an aerodynamic diameter of less than 10 µm (PM_{10}). Recent annual mean concentrations monitored at Birr (published on the EPA website[11]) are presented in **Table 8-3** below.

Table 8-3: Background PM_{10} Concentrations Birr, Co. Offaly (Source: EPA)

Year	Annual Mean (µg/m^3)	Number of Days >50 µg/m^3
2022	14.5	3
2021	12.2	2
2020	10.0	0

8.61 **Table 8-3** above indicates that PM_{10} concentrations monitored at the Birr monitoring site are below the annual mean Air Quality Standards (AQS) of 40 µg/m^3 and comply with the

[10] Birr Synoptic station closed in January 2009 and was replaced with Gurteen Automatic Weather Station (AWS)
[11] https://www.epa.ie/environment-and-you/air/

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requirement that a 24-hour mean of 50 µg/m^3 should not be exceeded more than 35 times in a calendar year.

8.62 For rural areas, such as those surrounding the application site, the primary source of PM_{10} would be residential solid fuel emissions and local agricultural or rural based activities for deposited dust.

Dust Deposition Monitoring

8.63 The results of the baseline dust deposition monitoring undertaken at the 4 no. locations around the application site between December 2023 and February 2024 are presented in **Table 8-4** below.

Table 8-4: Dust Deposition Monitoring Results

Sample Date	D1 (mg/m^2/day)	D2 (mg/m^2/day)	D3 (mg/m^2/day)	D4 (mg/m^2/day)
27/11/2023 – 09/01/2024	5	263 *	7	7
09/01/2024 – 12/02/2024	23	23	2	1
* Survey field notes indicate a high organic matter content				

8.64 As may be noted, baseline dust deposition rates around the application site at Mounthall are low and below the emission limit values (ELV's) recommended in the EPA (2006) *Environmental Management Guidelines for Environmental Management in the Extractive Industry (Non-Scheduled Minerals)* of 350 mg/m^2/day.

Meteorology: Dispersion of Emissions

8.65 The most important climatological parameters governing the atmospheric dispersion of particles are as follows:

- **wind direction** determines the broad transport of the emission and the sector of the compass into which the emission is dispersed; and
- **wind speed** will affect ground level emissions by increasing the initial dilution of particles in the emission. It will also affect the potential for dust entrainment.

8.66 Rainfall is also an important climatological parameter in the generation of dust; enough rainfall can suppress dust at the source and eliminate the pathway to the receptor. According to Arup (1995)[12], rainfall greater than 0.2 mm per day is sufficient to suppress dust emissions.

Local Wind Speed and Direction Data

8.67 An appropriate weather station with sufficient records of wind direction and wind speed considered representative of typical conditions experienced at the application site is Mullingar Meteorological Station (c. 55km north). A windrose for the average conditions recorded at Mullingar over a 20-year period (2002-2022) is presented in **Plate 8-1**. The predominant wind direction is from the south-western quadrant. Moderate to high-speed winds (>2 m/s) occur for approximately 77% of the time.

[12] Arup Environmental, Ove Arup and Partners (1995) The Environmental Effects of Dust from Surface Mineral Workings, HMSO, London (ISBM 11 75 3186 3)

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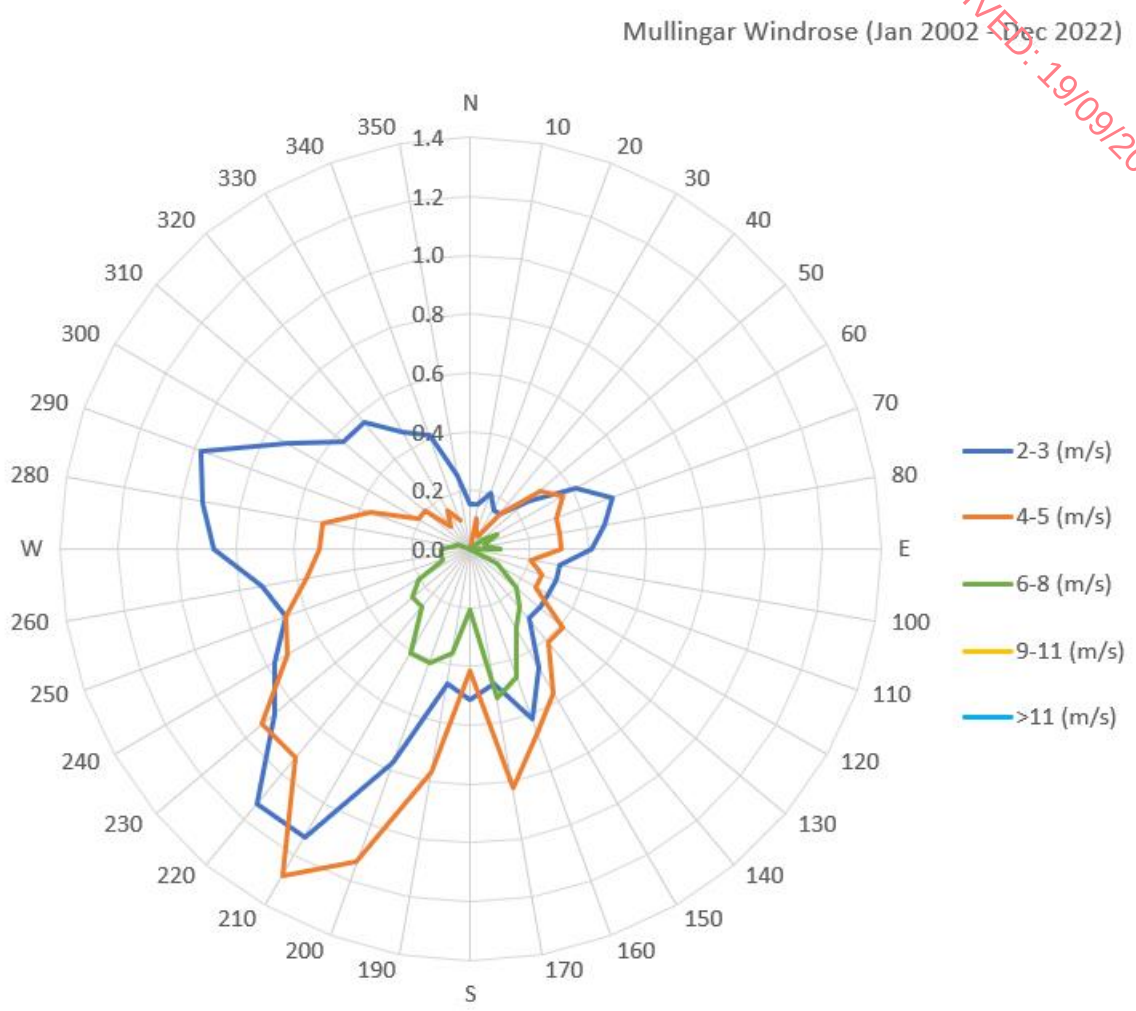
Plate 8-1: Windrose for Mullingar Meteorology Station



Rainfall Data

8.68 Relevant rainfall data applicable to the site has been obtained from the Irish Meteorological Service website for the Birr station (1979 – 2008)[13] c. 20km west of the application site and is considered representative of typical conditions experienced at the application site. The annual average days with rainfall greater than 0.2 mm are 206 days per year. Natural dust suppression (from rainfall) is therefore considered to be effective for 56% of the year.

8.69 In addition, a rain gauge station was installed at the site on 24th April 2024 at the entrance to the existing pit, see EIAR Chapter 7 **Plate 7-1**, with the average monthly rainfall for the on-site rain gauge is presented in EIAR Chapter 7 **Table 7-2**, and the daily rainfall measurements shown in EIAR Chapter 7 **Appendix 7-B**.

[13] Last period for 30-year average data at Birr Synoptic station before closure in January 2009 and was replaced with Gurteen Automatic Weather Station (AWS)

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Sensitive Receptors

Ecological Receptors

8.70 The application site is not subject to any statutory or non-statutory nature conservation designations. The closest Natura 2000 (SAC & SPA sites) and other designated sites are identified in **Table 8-5** and include three Natura sites: the Slieve Bloom SPA (site code 004160) adjacent to the northern application boundary/existing pit area; the Slieve Bloom SAC (site code 000412) located c. 1.5km to the north; and the River Barrow & River Nore SAC c. 2km to the east.

Table 8-5: Natura 2000 or Designated Site(s) within a 2 km of Application Site

Natura 2000 / Designated Site	Site Code	Location (closest point to Application Site)
Slieve Bloom Mountains SPA	004160	0 km (north) – bounds existing pit
Slieve Bloom Mountains SAC	000412	1.5 km (north)
River Barrow and River Nore SAC	002162	2 km (east)
Slieve Bloom Mountains pNHA	000412	1.5 km (north)
Delour river near Lacca Manor pNHA	000864	2 km (east)

8.64 Based on the nature, size, and scale of the planned development, it is considered that the maximum distance for which the project should be evaluated in terms of Natura 2000 or designated nature sites is up to a maximum radius of 2km unless there are any potential source-pathway-receptor links between the proposed development at Mounthall and Cummer townlands, and any Natura 2000 or designated site(s) beyond this distance. At a distance greater than 2 km, and in the absence of any potential source-pathway-receptor link, it is generally considered that no Natura 2000 or designated sites would be affected by any direct loss of habitat or otherwise be impacted upon.

Human Receptors

8.65 Sensitive locations are those where people may be exposed to dust from existing or planned activities. Locations with a high sensitivity to dust include hospitals and clinics, hi-tech industries, painting and furnishing and food processing. Locations classed as being moderately sensitive include schools, residential areas, and food retailers.

8.66 Receptors have been identified within a 1 km distance of the application site boundary at Mounthall and Cummer townlands, as listed in **Table 8-6** below and their locations shown in **Figure 8-1**. There are 50 sensitive receptors identified within the 1km of the application area of the application site.

Table 8-6: Sensitive Receptors within c. 1km of the Application Area (Red Line Boundary)

Receptor reference	Receptor	Sensitivity	Approx. Distance (m) to Planning Red Line Boundary / Direction from site boundary
R1	Residential	Medium	25 (E)
R2	Residential/Commercial	Medium	25 (E)
R3	Residential	Medium	5 (E)
R4	Residential	Medium	205 (E)

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R5	Residential	Medium	235 (S)
R6	Residential/Commercial	Medium	245 (SW)
R7	Residential	Medium	300 (S)
R8	Residential/Commercial	Medium	385 (SW)
R9	Residential	Medium	475 (SW)
R10	Residential	Medium	345 (W)
R11	Residential	Medium	275 (NE)
R12	Residential/Commercial	Medium	305 (NE)
R13	Residential	Medium	350 (NE)
R14	Residential	Medium	395 (NE)
R15	Residential	Medium	305 (E)
R16	Residential	Medium	330 (E)
R17	Residential	Medium	350 (E)
R18	Residential	Medium	400 (E)
R19	Residential	Medium	415 (E)
R20	Residential	Medium	450 (E)
R21	Residential	Medium	505 (E)
R22	Residential/Commercial	Medium	540 (E)
R23	Residential/Commercial	Medium	625 (E)
R24	Residential	Medium	685 (E)
R25	Residential/Commercial	Medium	685 (SE)
R26	Residential	Medium	585 (SE)
R27	Residential	Medium	710 (S)
R28	Residential	Medium	550 (SW)
R29	Residential	Medium	750 (SW)
R30	Residential	Medium	645 (N)
R31	Residential	Medium	740 (N)
R32	Residential	Medium	540 (NE)
R33	Residential	Medium	545 (NE)
R34	Residential	Medium	600 (NE)
R35	Residential	Medium	650 (NE)
R36	Residential	Medium	795 (E)
R37	Residential	Medium	940 (E)
R38	Residential	Medium	955 (E)
R39	Residential	Medium	770 (SE)
R40	Residential/Commercial	Medium	870 (SE)
R41	Residential/Commercial	Medium	845 (SE)

R42	Residential/Commercial	Medium	785 (SE)
R43	Residential	Medium	975 (S)
R44	Residential	Medium	870 (SW)
R45	Residential	Medium	805 (SW)
R46	Residential/Commercial	Medium	815 (SW)
R47	Residential	Medium	820 (SW)
R48	Residential	Medium	825 (SW)
R49	Residential/Commercial	Medium	870 (SW)
R50	Residential/Commercial	Medium	915 (N)

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Impact Assessment Methodology

Evaluation Methodology

8.67 Fugitive dust emissions and particulate matter arising from the application site activities have the potential to affect existing sensitive receptors in the area due to a potential increase in airborne dust deposition.

8.68 Increased combustion emissions (primarily oxides of nitrogen) from vehicle exhaust emissions associated with the proposed development also have the potential to contribute to local air pollution.

8.69 The significance of impacts due to emissions from the application site are dependent upon the magnitude of the emissions, the prevailing meteorological conditions for the location, and the proximity of sensitive locations to the emission sources.

8.70 This impact assessment is based upon a comparison of the baseline (both current and projected without the new development proposals) situation against the air quality impacts resulting from the 'with development' proposal scenario. The potential for 'in-combination' effects from other planned or proposed sources or air pollutants in the area has also been considered.

8.71 Each of the activities associated with extraction development have been assessed for potential air quality impacts including:

- emission from preparatory works, stripping, placement and stockpiling of soil (earthworks / trackout);
- emissions from sand and gravel extraction and processing;
- emissions from the transfer, end-tipping and stockpiling of aggregates;
- PM_{10} contribution from operational activities; and
- traffic exhaust emissions.

8.72 The methodology used in each assessment is presented in the sub-sections below which also provide an explanation of the significance criteria to describe the impacts of the proposed development on air quality.

8.73 For the purposes of environmental assessment of releases of dust from construction and mineral activities, the classifications of PM_{10} and 'deposited dust' are typically applied. The impacts associated with PM_{10} are related to potential health impacts while deposited dust is

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related to potential nuisance effects. The assessment of the potential impacts of each fraction has, therefore, been undertaken separately.

Significance Criteria

8.74 The following air quality specific significance criteria have been used to assess the significance of air quality impacts in preference to overall descriptors of significance.

8.75 To determine the significance of particulate matter effects associated with the development, an evaluation of the sensitivity of the surrounding area is required. Receptors can demonstrate different sensitivities to changes in environment and are classified as per **Table 8-7** below (and IAQM Construction Dust Guidance).

Table 8-7: Methodology for Defining Sensitivity to Dust and PM_{10} Effects

	Examples	
Sensitivity of Area	Human receptors	Ecological Receptors (a)
Very High	Very densely populated area More than 100 dwellings within 20 m Local annual mean PM_{10} concentrations exceed the Objective. Works continuing in one area of the site for more than 1-year	European Designated sites
High	Densely populated area. 10-100 dwellings within 20 m of site. Local annual mean PM_{10} concentrations close to the Objective (36 – 40 µg/m^3)	Nationally Designated sites
Medium	Suburban or edge of town Less than 10 receptors within 20 m Local annual mean PM_{10} concentrations below the Objective (30 – 36 µg/m^3)	Locally designated sites
Low	Rural area; industrial area No receptors within 20 m Local annual mean PM_{10} concentrations well below the Objective (<30 µg/m^3) Wooded area between site and receptors	No designations
Notes: (a)-Only applicable if ecological habitats are present which may be sensitive to dust effects.		

8.76 **Table 8-8** below illustrates how the interaction of magnitude and sensitivity results in the significance of an environmental effect, with the application of mitigation measures as per the IAQM Construction Dust Guidance.

Table 8-8: Impact Significance Matrix – Dust Effects (With Mitigation)

Sensitivity of Surrounding Area	Risk of Site Giving Rise to Dust or PM_{10} Effects		
	High	Medium	Low
Very High	Slight Adverse	Slight Adverse	Negligible
High	Slight Adverse	Negligible	Negligible
Medium	Negligible	Negligible	Negligible

Sensitivity of Surrounding Area	Risk of Site Giving Rise to Dust or PM_{10} Effects		
	High	Medium	Low
Low	Negligible	Negligible	Negligible

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Construction Stage Dust Impacts - Methodology

8.77 The Institute of Air Quality Management (IAQM) assessment of risk at construction stage is determined by considering the predicted change in conditions because of the proposed development. The risk category for potential effects arising from preparatory site works is divided into two potential activities:

- earthworks;
- trackout.

8.78 Based on the scale and nature of the works including areas, soils and operations at the site, a dust emission class is defined for each of the activities. These dust emission classes are then used to determine the risk categories presented below. These risk categories determine the potential risk of dust soiling effects assuming no mitigation measures are applied.

8.79 **Table 8-9** illustrates how the interaction of distance to the nearest receptor and the dust emission class results in the determination of risk category from ***earthworks activities***.

Table 8-9: Determination of Risk Category from Earthworks Activities

Distance To Nearest Receptor		Dust Emission Class		
Human (m)	Ecological (m)	Large	Medium	Small
<20	-	High Risk Site	High Risk Site	Medium Risk Site
20 – 50	-	High Risk Site	Medium Risk Site	Low Risk Site
50 – 100	<20	Medium Risk Site	Medium Risk Site	Low Risk Site
100 – 200	20 – 40	Medium Risk Site	Low Risk Site	Negligible
200 – 350	40 – 100	Low Risk Site	Low Risk Site	Negligible

8.80 **Table 8-10** illustrates how the interaction of distance to the nearest receptor and the dust emission class results in the determination of risk category from ***trackout movements***.

Table 8-10: Determination of Risk Category from Trackout Movements

Distance To Nearest Receptor		Dust Emission Class		
Human (m)	Ecological (m)	Large	Medium	Small
<20	-	High Risk Site	Medium Risk Site	Medium Risk Site
20 – 50	<20	Medium Risk Site	Medium Risk Site	Low Risk Site
50 – 100	20 – 100	Low Risk Site	Low Risk Site	Negligible

8.81 Mitigation measures are recommended based on the evaluation of risk in accordance with the IAQM Dust and Air Emissions Mitigation Measures Guidance.

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Operational Stage Dust Impacts - Methodology

8.82 A staged approach has been adopted to the assessment of operations stage impacts generated by the proposed development (i.e. sand & gravel extraction and processing). This ensures that the approach taken for the assessment of risk is proportional to the risk of an unacceptable impact being caused. As such, where a simple review of the situation shows that risk of a health or nuisance impact is negligible, this will be sufficient. In cases where the risk cannot be regarded as insignificant, a more detailed assessment may be required, such as a quantitative screening assessment or an advanced dispersion modelling exercise, as appropriate.

8.83 Guidance on the assessment of the impacts of extractive operations on air quality has been prepared by the Institute of Air Quality Management (IAQM). This guidance uses a simple distance-based screening process to identify those operations where the dust impacts are unlikely to be significant and therefore require no further assessment. Where assessment that is more detailed is required, a basic assessment framework is presented which employs the Source-Pathway-Receptor approach to evaluate risk of impacts and effects.

8.84 The predicted scale of dust effects may be classified as either 'significant', or 'not significant'. Where effects are predicted to be 'significant', further mitigation is likely required before the proposals are to be acceptable under planning policy.

8.85 A semi-quantitative assessment of fugitive dust emissions from the proposed development has been undertaken. The assessment has been undertaken by constructing a conceptual model that takes into consideration the potential sources, surrounding receptors, and the pathway between source and receptor to assess the magnitude of risk of impact on local amenities.

8.86 The distance from the source to the sensitive receptor is crucial. The initial risk screening stage (Tier 1) focuses upon the potential for dust generation at the site and the distance between source and receptors. In Tier 1 of the assessment, a representative selection of dust sensitive receptors in each direction of the application site is identified within the 1 km study area.

8.87 Further assessment is required for those nearest receptors within 500m (shaded green on **Table 8-6**) of dust generating activities. Receptors within 500m[14] of dust generating processes progress onto a Tier 2 assessment. Other receptors beyond 500m are considered too far away to be impacted by potential dust from the site and not considered any further in this assessment.

8.88 Tier 2 involves identifying source-pathway-receptor linkages and a semi-quantitative assessment of the likelihood and magnitude of any effects that could be associated with each pollutant linkage. This assessment takes account of:

- wind direction and speed data (to estimate frequency of exposure);
- proximity to source (to estimate magnitude of exposure);
- sensitivity of receptor; and
- occurrence of natural dust suppression (rainfall patterns).

8.89 This information is used to inform a semi-quantitative assessment of the likely magnitude of impact and is based upon professional experience of the assessor as the issue of dust nuisance on local receptors is a subjective issue, where public perception on what constitutes 'acceptable' levels varies from one person to the next. Assigning significance to nuisance

[14] Residence R21 which lies just outside the 500m radius is included in the assessment

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impacts is qualitative and involves a judgement based on the likely magnitude, frequency, duration, and reversibility (or recovery) of the impact. In this context, significant impact is taken to mean what is generally not publicly acceptable and desirable.

8.90 Note that the Tier 2 risk screening assessment **does not consider proposed mitigation measures** to be implemented at the proposed development. These will include provision of perimeter screening berms, dust suppression measures etc., identified in the section dealing with Mitigation Measures later in this Chapter.

8.91 Following the results of the risk assessment, mitigation measures are detailed, and the residual impact assessed. The detailed methodology used within the assessment is described in more detail in **Appendix 8-A**.

PM_{10} Contribution from Site-Based Activities: Methodology

8.92 In terms of whether the PM_{10} concentration in the local area is likely to exceed the AQS, the following information has been reviewed:

- existing PM_{10} concentrations; and
- expected additional contribution of PM_{10} from site operations.

8.93 In terms of estimating the potential magnitude of impact from site operations, a UK edition of the LAQM Technical Guidance (LAQM.TG (03)) stated that fugitive dust from stockpiles and quarry operations can potentially contribute up to 5 µg/m^3 towards annual mean background concentrations of the coarse fraction of particulates (2.5-10 µm diameters) in the surrounding area.

8.94 Given that the nature and scale of proposed future activities around the proposed development will be comparable to pre-existing / prior activities, the potential PM_{10} impact is likely to be lower than that indicated by the LAQM guidance. However, to ensure a robust assessment of potential PM_{10} impacts, the upper limit of 5 µg/m^3 has been applied to represent the development contribution to annual ambient PM_{10} concentrations. This value has then been added to existing background levels to assess whether the Air Quality Standards objective is likely to be exceeded.

Traffic Emissions - Methodology

8.95 Atmospheric emissions related to site proposals are primarily associated with the exhaust emissions from heavy duty vehicles (HDVs also termed heavy goods vehicles HGV's). The decision as to whether an assessment of potential impact is required is based upon the criteria set out in the DMRB.

8.96 The criterion for assessment of air quality contained within the latest DMRB guidance (LA 105) focuses on roads with relatively high changes in flows or high proportion of HDV / HGV traffic.

8.97 The following traffic scoping criteria shall be used to determine whether the air quality impacts of a project can be scoped out or require an assessment based on the changes between the do something traffic (with the project) compared to the do minimum traffic (without the project) in the opening year:

- annual average daily traffic (AADT) ≥ 1,000; or
- heavy duty vehicle (HDV) AADT ≥ 200; or
- a change in speed band; or
- a change in carriageway alignment by ≥ 5 m.

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Assessment of Impacts

Construction Stage, Soil Stripping & Restoration Activities Stages Impacts – Assessment

8.98 An overview of the sources and processes associated with the preparatory site works (topsoil and overburden removal), the construction / infrastructure activities and restoration activities, and their respective potential for dust deposition (both dust and smaller particles), is presented below in **Table 8-11**.

Table 8-11: Site Activities: Sources of Dust Emissions

Activity	Source	Emission potential	Comments
Earthworks, Construction and Trackout Activities	Excavators / Dozers / HGVs	**High** - dry or fine materials during strong windy weather	Temporary, variable from day to day depending on prevailing meteorological conditions, level, and location of activity.
		Low - coarse or wet materials during conditions of low wind speed	Soils immediately used to construct berms, used in restoration works or placed in stockpiles.

8.99 During the site preparatory works, activities at the site will be confined to within the application site. In light of this and the separation distance to sensitive receptors, the IAQM Construction Dust Guidelines indicates that the dust risk category would be considered to be 'low risk' to 'negligible'. A summary of the determined risk category for proposed operation identified is presented in **Table 8-12**.

Table 8-12: Site Activities: Risk of Dust Emissions

Source	Risk of Dust Soiling Effects	Ecological Effects
Earthworks	Low risk	Negligible
Construction	Low risk	Negligible
Trackout	Low risk	Negligible

8.100 While the overall risk category has been assessed as 'low risk' to 'negligible', if the soils stripping, construction and trackout activities were not mitigated, the effects of dust during dry and windy conditions could possibly lead to occasional increases in nuisance dust immediately surrounding the application area. However, these are not considered to be significant given the limited duration of such meteorological conditions and the limited change in the extent and scale of the proposed activities.

Operational Stage (Extraction & Processing) Dust Impact – Assessment

8.101 When commenced and operational, the principal air quality impacts generated by the proposed development will be dust and traffic related emissions. An overview of the sources and processes associated with the extraction and processing activities, and their respective potential for dust deposition, is presented **Table 8-13** below.

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Table 8-13: Sources of Particulate Emissions

Activity	Source	Emission potential	Comments
Material transfer to processing area	On-site vehicle, Dry loose material.	**High** when dry material being handled during strong windy weather	Emissions due to prevailing meteorological conditions and amount of dry loose material. Emissions due to re-suspension of loose material on surfaces.
Processing of sand and gravel	Processing plant, Dry loose material	**High** when dry material being processed during strong windy weather	Emissions due to prevailing meteorological conditions (high winds).
Material transfer to storage area	On-site vehicle, Dry loose material	**High** when dry material being handled during strong windy weather	Emissions due to prevailing meteorological conditions and amount of dry loose material. Emissions due to re-suspension of loose material on surfaces.
Material storage	Dry loose material in stockpiles	**High** when dry material being stored during strong windy weather	Emissions due to prevailing meteorological conditions (high winds).
Material loading to HGV	On-site vehicle, Dry loose material	**High** when dry material being handled during strong windy weather	Emissions due to prevailing meteorological conditions and amount of dry loose material. Emissions due to re-suspension of loose material on surfaces.
Transfer off site / traffic off site	HGV / Road vehicles	**Low** - on paved road surfaces	Dependent on the amount of loose material on road surface available for re-suspension and track out.

Human Receptors

8.102 A total of 50 representative residence receptors were identified within the c. 1km study area around the application site. Using the tiered assessment methodology, 21 of these receptors located within c. 500m have progressed onto a Tier 2 assessment as they are considered to have a greater risk of dust impact. Each receptor is assessed against the frequency of exposure and the distance from the source to the receptor (i.e., the pathway) in accordance with the methodology described in **Appendix 8-A.**

8.103 The frequency of exposure of each receptor is based upon the frequency of winds capable of carrying dust particles blowing in the direction, from the source to the receptor, on days when rainfall does not inhibit dust from becoming airborne. Representative data on the local wind climate is therefore required for this section of the assessment.

8.104 The wind-rose presented in **Figure 8-1** for Mullingar Meteorological Station (and which is considered indicative of the application site conditions) illustrates the predominant wind directions from the south-west. The potential for the generation of airborne dust will increase with wind speed, with winds greater than 3 m/s capable of carrying airborne dust[15].

8.105 The wind rose shows the frequency of winds at wind speeds of greater than 2 m/sec with the individual frequencies for each 10-degree compass sector used within the assessment. In this assessment, wind speeds over 2 m/s were used as this is how the data on percentage

[15] Department of the Environment, Transport, and the Regions, 1995. *The Environmental Effects of Dust from Surface Mineral Workings* – Volume 2. Technical Report. December 1995.

occurrence of wind frequency and wind speed is calculated and presented by Met Eireann. For this reason, the impact assessment presented herein is conservative.

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8.106 A summary of the risk assessment of dust impacts at the selected Tier 2 receptors / locations arising from the proposed development activities (**in the absence of any mitigation measures**) is presented in **Table 8-14** below.

Table 8-14: Dust Risk Assessment Screening (Without Mitigation Measures)

Receptor Reference	Distance From Operations (m)	Relevant Wind Direction (A)	Potential Exposure Duration (B)	Rank (C) Relative Rank: Windy/Distance	Risk Evaluation
R1	25 (E)	130-360	32.0	5/8	Moderate Adverse
R2	25 (E)	250-320	10.4	2/8	Slight Adverse
R3	5 (E)	260-330	9.4	2/8	Slight Adverse
R4	205 (E)	260-310	8.0	2/4	Acceptable
R5	235 (S)	340-30	1.7	1/4	Insignificant
R6	245 (SW)	30-70	2.6	1/4	Insignificant
R7	300 (S)	0-40	1.0	1/3	Insignificant
R8	385 (SW)	20-50	1.1	1/3	Insignificant
R9	475 (SW)	30-60	1.6	1/2	Insignificant
R10	345 (W)	90-140	4.2	1/3	Insignificant
R11	275 (NE)	190-250	14.1	3/4	Acceptable
R12	305 (NE)	200-260	14.5	3/3	Acceptable
R13	350 (NE)	220-270	11.5	2/3	Insignificant
R14	395 (NE)	230-280	10.2	2/3	Insignificant
R15	305 (E)	270-300	5.8	1/3	Insignificant
R16	330 (E)	270-300	5.8	1/3	Insignificant
R17	350 (E)	270-300	5.8	1/3	Insignificant
R18	400 (E)	260-290	6.1	1/2	Insignificant
R19	415 (E)	260-290	6.1	1/2	Insignificant
R20	450 (E)	260-290	6.1	1/2	Insignificant
R21	505 (E)	260-290	6.1	1/1	Insignificant
(**A**) – relevant wind direction based on upwind sector which would potentially convey from site towards the receptor.					
(**B**) – Potential duration of exposure based on frequency of moderate to high wind speed (adjusted for dry days only) as described in the methodology in **Appendix 8-A.**					
(**C**) – Ranking as per methodology in **Appendix 8-A**. Refer to **Figure 8-1** for Receptor Locations					

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8.107 From **Table 8-14** above, it is observed that the risk of impact from dust emissions associated with the proposed development at Mounthall (**without any mitigation measures in place**) varies from:

- Insignificant at R5 - R10 and R13 – R21;
- Acceptable at R4, R11 & R12;
- Slight Adverse at R2 & R3; and
- Moderate Adverse at R1 (Landowner residence).

8.108 Using the screening assessment tool, the Air Quality Assessment (outlined in **Appendix 8-A**) considers that there is generally an insignificant to moderate adverse risk that dust may cause an impact at sensitive receptors within 500m of the source of the dust generated activities.

8.109 Note that this assessment ***does not consider*** implementation of mitigation measures within the proposed development that include provision of perimeter screening berms and strengthened boundary vegetation / screen planting, dust suppression measures etc. (as outlined in the section of Mitigation Measures section below).

8.110 Furthermore, the assessment is considered conservative on the basis that the reference wind speed for the risk evaluation was less than that required to carry airborne dust.

Restoration Phase

8.111 The restoration phase will entail decommissioning and removal of plant and equipment following cessation of sand and gravel extraction activities and the final restoration of the application site to agricultural lands thereafter. Potential air quality impacts associated with this phase of development will be negligible.

Ecological Receptors

8.112 The existing sand and gravel pit and extension application site are not subject to any statutory nature conservation designation.

8.113 The Slieve Bloom Mountains SAC & pNHA (both 1.5km north), the River Barrow and River Nore SAC (2km east) and the Delour river near Lacca Manor pNHA (3km east), due to the small-scale operations proposed at the site and their distance from the site are considered too far distant to be significantly impacted by dust.

8.114 However, as noted previously, the nearest protected site (the Slieve Bloom Mountains SPA) is located directly north of the application site boundary at its nearest point.

8.115 The distance where sand and gravel extraction will be carried out will mostly be in excess of 100m from the edge of the SPA boundary. Therefore, most of the dust created through the proposed works will deposit within 100m and will not reach the SPA. Large dust particles (greater than 30 µm), which make up the greatest proportion of dust emitted from minerals workings, will largely deposit within 100m of sources. Intermediate-sized particles (10-30 µm) are likely to travel up to 200-500m (IAQM, 2016). Therefore, the potential area of habitat within the SPA likely to be impacted by dust is relatively small, as identified in the Natura Impact Statement (NIS).

8.116 As noted in the 2016 IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning, an ecological receptor refers to any sensitive habitat affected by dust deposition and can include the direct impacts on vegetation or aquatic ecosystems and the indirect impacts on fauna (e.g. on foraging habitats). For locations with a statutory designation such as the Slieve Bloom Mountains SPA, consideration should be given as to whether the particular site is sensitive to dust, and this will depend on why it has been designated.

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8.117 The conservation objective for Slieve Bloom Mountains SPA aims to maintain the extent and condition of hedgerows, heath, bog, low intensity managed grasslands, and associated habitats within the SPA. These can provide important foraging resources for breeding hen harriers, and in the case of heath and bog, can also provide important nesting resources. The level of dust deposition likely to lead to a change in vegetation is very high (over 1g/m2/day) and the likelihood of a significant effect is therefore very low except on the site with the highest dust release close to sensitive habitats.

8.118 The NIS determines that emissions to air will not directly impact the qualifying interests (QI) species hen harrier but there is a risk that dust created from the project could impact important habitats within the SPA for this species, albeit at a very small fraction of the overall habitat within the wider SPA. Without appropriate mitigation measure, this would have potential to impact the integrity of the site.

8.119 It is proposed that the direction of sand and gravel extraction (refer to EIAR Chapter 2 **Figure 2-2**) will be carried out in a northerly direction towards the SPA boundary with the intervening face and site topography acting as a wind break. It is anticipated that this, along with the proposed perimeter screening berms and vegetation planting and the range of mitigation measures outlined in **Table 8-15** will screen fugitive dust and prevent it from being carried any significant distance into the forested area.

8.120 It should also be noted that the prevailing winds are from the southwest and the SPA boundary is located to the north of the existing pit over a short length of boundary (c. 150m) in a localised area with the majority of the application site boundary being in excess of 250m from the SPA.

8.121 Studies have indicated that fugitive dust is typically deposited within 100 to 200m of the source, the greatest proportion of which, comprising larger particles (greater than 30 microns) is deposited within 100m. Where large amounts of dust are deposited on vegetation over a long timescale (a full growing season for example) there may be some adverse effects upon plants restricting photosynthesis, respiration, and transpiration.

8.122 Dust deposition monitoring at the site indicates that the levels of dust generated are well below the level of 1,000 mg/m^2/day, where it is considered that dust could be likely to have a significant effect on sensitive ecosystems, refer to guidance section above.

8.123 Based on the above, with the proposed mitigation measures to be implemented and given the low baseline dust levels observed along with the fact that the vast majority of sand and gravel extraction will be carried out well in excess of 100m from the Slieve Bloom Mountain SPA boundary, it is considered that the proposed development will have an insignificant dust deposition impact on ecological receptors, including the adjoining Slieve Bloom Mountains SPA and the other Natura sites identified in **Table 8-5** above.

8.124 Furthermore, the Natura Impact Statement, based on the best available scientific information, concludes that, considering the proposed mitigation measures which are designed to prevent likely significant effects from emissions to air (dust) from the Project will not undermine the conservation objectives of the River Barrow and River Nore SAC, Slieve Bloom Mountains SPA and River Nore SPA, either alone or in-combination with other projects or plans.

Traffic Emissions - Assessment

8.125 For the purposes of assessment, the projected traffic movements associated with the proposed development will generate an average of 24 HGV trips per day[16].

8.126 In view of:

[16] Based on an average annual extraction rate of 80,000 tonnes

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- the low levels of predicted HGV traffic associated with the development; and
- the fact that none of the roads in the surrounding local road network meet any of the traffic / alignment criteria set out in LA 105.

it is considered that the extent of any traffic related change arising from future extraction and restoration activities can be deemed 'negligible' in terms of its resultant impact on local air quality and that no further air quality assessment is necessary.

8.127 On this basis, the impact of the proposed development can be screened out and combustion emissions (primarily oxides of nitrogen) from vehicle exhaust emissions associated with the transportation of materials will not have the potential to contribute to local air pollution.

PM_{10} Contribution from Extraction / Production Activities - Assessment

8.128 In terms of PM_{10}, the maximum recent annual mean measured baseline background concentration was 14.5µg/m^3 in 2022 at Birr, Co. Offaly monitoring station. In terms of estimating the potential magnitude of impact from site operations, a UK edition of the LAQM Technical Guidance (LAQM.TG(03)) stated that fugitive dust from stockpiles and quarry operations can potentially contribute up to 5 µg/m^3 towards annual mean background concentrations of the coarse fraction of particulates (2.5 – 10 µm diameters) in the surrounding area. Given that the nature and scale of proposed future activities around the site will be comparable to pre-existing/prior activities, the potential PM_{10} impact is likely to be lower than that indicated by the LAQM guidance. To ensure a robust assessment of potential PM_{10} impacts, one approach might be to apply the upper limit of 5 µg/m^3 to represent potential future development contribution to annual background/ambient PM_{10} concentrations to assess whether the Air Quality Standards objective is likely to be exceeded. The potential contribution of up to 5 µg/m^3 towards annual mean background concentrations of the coarse fraction (2.5 – 10 µm diameters) of particulates (in the immediate area of the site) is insignificant and well below the annual objective of 40 µg/m^3.

8.129 Therefore, the potential impacts in relation to increase in ambient PM_{10} concentrations can be classified as 'negligible' when the limited duration of conditions and the magnitude of change in the extent and scale of activities are considered to significantly reduce the generation of airborne PM_{10} beyond the site development boundary.

8.130 Given the limited magnitude of change in the extent and scale of planned activities at the site, the available monitoring data are taken to be representative of ambient PM_{10} concentrations likely to arise over the life of the proposed pit extension. As such, any potential future impact in relation to increased ambient PM_{10} concentrations is classified as 'negligible'.

Unplanned Events (i.e., Accidents)

8.131 Accidents, malfunctions, and unplanned events refer to events or upset conditions that are not part of any activity or normal operation of the proposed development planned by the Applicant. Even with the best planning and the implementation of preventative measures, the potential exists for accidents, malfunctions, or unplanned events to occur during the proposed development operations.

8.132 Many accidents, malfunctions and unplanned events are, however, preventable and can be readily addressed or prevented by good planning, design, emergency response planning, and mitigation. In terms of air quality impact, the following unplanned events could influence the local area:

- equipment malfunction;
- vehicle collision;
- dry and windy weather conditions with dust suppression equipment malfunction; and

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- accidental material spillages during transport.

8.133 In relation to air quality, the impacts of any unplanned events are considered to be negligible. If unplanned events were not mitigated, the effects of dust during dry and windy conditions could possibly lead to occasional increases in nuisance dust and 24-hour mean PM_{10} concentration immediately surrounding the application site. However, these are not considered to be significant given the limited duration of such meteorological conditions and the likely limited scale of any incident.

Cumulative / Synergistic Impacts

8.134 In essence, cumulative impacts are those which result from incremental changes caused by other past, present, or reasonably foreseeable actions or developments together with those generated by the proposed development. Therefore, the potential impacts of the proposed development cannot be considered in isolation but must be considered in addition to impacts already arising from existing or planned development.

8.135 This air quality impact assessment herein indicates that the proposed development will not contribute to a significant increase in local air pollution by way of excessive air / dust emissions. There are no other significant sources of air emissions approved or planned within 2 km of the application site and no potential for significant cumulative impacts has been identified. The cumulative impact of the proposed development is therefore classified as insignificant.

Interaction with Other Impacts

8.136 The potential impact on air quality by the project on sensitive receptors including sensitive ecological receptors and people living in the area has been fully assessed in this chapter. The overall impact of the project on these receptors is further considered in Chapter 4 Population and Human Health and Chapter 5 Biodiversity.

Mitigation Measures

8.137 A wide range of dust mitigation and management measures are recommended for implementation at the application site. These include the measures listed in **Table 8-15** below:

Table 8-15: Particulate Emission Mitigation Measures

Source / Receptor	Emission Potential	Recommended Mitigation Measures	Effectiveness
Excavators / HGV Loading	**High** – dry or fine material during strong windy weather	Minimise drop heights when handling materials. Maximise use of excavated soil in construction of vegetated screening berms or in pit restoration works. Dampen materials using mist cannon, sprinklers, or water bowser	High
	Low – material of high moisture content during conditions of low wind speed	Minimise drop heights when handling material. Protect from wind where possible.	High
		Minimise length of on-site haul routes.	High

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Source / Receptor	Emission Potential	Recommended Mitigation Measures	Effectiveness
On-site Vehicles	**High** when travelling over un-surfaced and dry site roads.	Use of mist cannon / sprinklers / water bowser t dampen haul routes during dry weather periods.	High
		Restrict vehicle speeds to less than 20kph. Install signage and undertake staff training.	High
		Routing of traffic and away from any surrounding sensitive receptors.	High
Road Vehicles (transfer off-site)	**Low** / **Moderate** on paved road surfaces	Use of road sweeper to reduce the amount of material available for re-suspension.	Moderate / High
		Travel over paved surfaces / access road.	High
		Direct all HGVs through wheelwash facility	High
Stockpiles	**High** when dry or fine material being stored or handled during strong windy weather	Seed / vegetate surfaces of completed perimeter mounds and stockpiles of restoration soils.	High
		Locate stockpiles to take advantage of any available shelter from wind.	High
		Use of mist cannon / sprinklers / bowser to moisten materials during periods of dry and windy weather	High
		Limit mechanical disturbance of materials more likely to become airborne and/or time operations having regard to expected weather conditions	High
Moderate and Slight Adverse Risk Receptors	**High** – during dry and strong windy weather	Hardstanding areas/site roads, stockpiles with the potential to give rise to dust will be regularly watered as appropriate during dry and/or windy conditions by dust cannon, sprinklers, or water bowser.	High
		Retention of perimeter hedgerows	High
		Provision of screening berms	High

Trackout Measures

8.138 When required, for example during adverse weather conditions (dry, windy weather), water from a bowser will be sprayed on dry unpaved road surfaces to minimize dust rise. Any paved surfaces around the site and/or along the access road leading in and out of the site will also be sprayed as required.

8.139 All heavy goods vehicles leaving the application site will be routed through the proposed new wheelwash facility to remove and / or dampen any particulate materials attaching to the undercarriage and to prevent transport of fine particulates off-site, onto the local public road network.

Good Practice Measures

8.140 Effective site management practices are critical to demonstrate the willingness of the operator to control dust emissions. Monitoring of dust deposition and recording of any complaints shall be carried out to take appropriate measures to reduce emissions in a timely manner.

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8.141 Breedon Ireland have in place a group wide Environmental Management System (EMS) which is accredited to ISO 14001 standard. The EMS contains procedures and work instructions which include specific measures in relation to the protection of air quality and control of dust at operational sites. All personnel within Breedon Ireland undergo EMS training regularly.

8.142 Training on dust mitigation measures shall be provided to site-based staff. Training will also cover an 'emergency preparedness plan' to react quickly in case of any failure of dust mitigation measures.

8.143 A water bowser will be made available at required times to dampen down stockpiled / particulate materials and/or unpaved surfaces when adverse (dry, windy) conditions apply.

Residual Impact Assessment

Human Receptors

8.144 With the range of mitigation measures to be implemented and design measures to be incorporated into the working scheme, it is considered that the risk of dust related impacts at receptors generated by the proposed site activities will be further reduced.

8.145 After an assessment of potential adverse effects produced by the development it was concluded that there would be no significant adverse air quality effects for human receptors which could cumulatively impact the site or the surrounding area. Overall, the effects of the proposed development on air quality have been considered to be insignificant to acceptable because of the high effectiveness and range of possible mitigation measures at source locations as indicated in **Table 8-15**.

8.146 A summary of the residual dust risk impact assessment at the closest sensitive receptors is provided in **Table 8-16** below.

Table 8-16: Residual Dust Risk Assessment (With Mitigation Measures)

Receptor Reference	Risk Evaluation
R1	Acceptable
R2	Acceptable
R3	Acceptable
R4	Insignificant
R5	Insignificant
R6	Insignificant
R7	Insignificant
R8	Insignificant
R9	Insignificant
R10	Insignificant
R11	Insignificant
R12	Insignificant
R13	Insignificant
R14	Insignificant

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Receptor Reference	Risk Evaluation
R15	Insignificant
R16	Insignificant
R17	Insignificant
R18	Insignificant
R19	Insignificant
R20	Insignificant
R21	Insignificant

8.147 On the basis of the assessment presented above, it is concluded that the proposed development, with the range of mitigation measures to be implemented and design measures incorporated into the working scheme, will not have any adverse or unacceptable dust deposition impact on any nearby sensitive receptors.

Monitoring

8.148 Dust deposition monitoring will be undertaken at the site for the duration of extraction and restoration activities at the proposed development site (in accordance with conditions attached to any future planning permission and in line with the EPA and DoEHLG guidelines). Dust monitoring will be undertaken at the existing baseline monitoring locations D1 to D4 on a quarterly basis (or other agreed time schedule with the Planning Authority) using the Bergerhoff Method.

8.149 Dust monitoring locations shall be reviewed and revised where and as / when necessary, as the proposed development progresses. The results of the dust monitoring will be submitted to Laois County Council as required for review and record purpose.

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Figures

Figure 8-1 Baseline Dust Monitoring Locations (And Receptors within 1km)