



SOIL CHARACTERISATION AND
SITE SUITABILITY ASSESSMENT REPORT
TE REF: 22/042TE

**LONGFORD COUNTY COUNCIL
LETTERGEERAGH
DRUMLISH
CO. LONGFORD**

**IN ACCORDANCE WITH
EPA CODE OF PRACTICE
WASTEWATER TREATMENT AND DISPOSAL
SYSTEMS SERVING SINGLE HOUSES 2021**



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SITE CHARACTERISATION FORM FOR AN ON-SITE WASTEWATER TREATMENT SYSTEM

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1.0 GENERAL DETAILS (From planning application)

Name(S)	Longford County Council	
Address of Correspondance	c/o CS Pringle & Associates Moraghy, Castleblayney, Co. Monaghan	
Site Location and Townland	Lettergeeragh Drumlish Co Longford	
Number of Bedrooms	4	Maximum Number of Residents:
		6
Comments on population equivalent	6PE is the maximum capacity of the dwelling	

Proposed Water Supply:

Mains: Private Well/Borehole Group Well/Borehole

2.0 GENERAL DETAILS (From planning application)

Soil Type, (Specify Type):	Soil Association 25 Gleys (50%), Acid Brown Earths (40%), Interdrumlin Peat and Peaty Gleys (10%)		
Subsoil, (Specify Type):	Silt/Clay		
Bedrock Type:	Ordovician Metasediments		
Aquifer Category:	Regionally Important <input type="checkbox"/>	Locally Important <input type="checkbox"/>	Poor <input checked="" type="checkbox"/>
Vulnerability:	Extreme <input type="checkbox"/>	High <input type="checkbox"/>	Moderate <input type="checkbox"/> Low <input checked="" type="checkbox"/>
Groundwater Body:	IE_SH_G_149	Status	Not at Risk
Name of Public/Group Scheme Water Supply within 1km:	Unknown		
Source Protection Area:	ZOC <input type="checkbox"/> n/a	SI <input type="checkbox"/> n/a	SO <input type="checkbox"/> n/a
Groundwater Protection Response:	R1		
Presence of Significant sites (Archaeological, natural and historical):	None evident within the locality		
Past experience in the area:	Variable percolation characteristics of the topsoil and subsoil materials.		

R1 = Acceptable subject to normal good practice. Site may be suitable for discharge to ground, if the minimum depths are met on the site and if there exists suitable percolation. As the soil type in the area is gleys (50% of the land area), and as the area is mapped as 'Low' Vulnerability. Groundwater as a resource will be at risk if the minimum depths required are not achieved on the site, or if the percolation rate is too rapid. Older wells in the area may also be at risk, if the minimum separation distances are not adhered to. Groundwater and wells are therefore the main targets, following the desk study. Given the response and the aquifer type, the site is potentially suitable for a conventional septic tank system if the minimum depths required are met on the site, if the minimum separation distances can be met, and if the percolation rate is adequate.

¹This figure of 6 people refers to the potential 6 people maximum that will stay at the proposed dwelling at any one time. As per the Clarification to the design capacity requirements in Section 7 and Section 9 of the Code of Practice: Waste Water Treatment and Disposal Systems serving Single Houses (p.e. <10) (CoP) 4 double rooms is equivalent to 6PE as per the Clarification.

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment

Landscape Position	<i>Relatively Flat</i>			
Slope	<i>Steep <1:5</i>	<i>Shallow 1.5 to 1.20</i>	✓	<i>Relatively Flat</i>
Slope Comment	<i>Sloping in west direction</i>			

Surface features within a minimum of 250 metres (Distances to features should be noted in metres)

Houses	<i>Neighbouring house located >10m northeast from the proposed percolation area (ppa).</i>
Existing Land Uses	<i>Agricultural grassland</i>
Vegetation Indicators	<i>Grass is the predominant vegetation within the ppa.</i>
Groundwater Flow Directions	<i>West Direction</i>
Ground Condition	<i>Ground conditions are best described as dry in the ppa.</i>
Site Boundaries	<i>Hedge and road are located to the west of the ppa. Hedge and lane are located to the north of the ppa. Hedge is located to the south of the ppa. Farm sheds are located to the east of the ppa.</i>
Roads	<i>Located road located >10m west from the ppa</i>
Outcrops (Bedrock and/or subsoil)	<i>None Identified or Evident within the locality.</i>
Surface water ponding	<i>No surface water ponding was evident in the ppa when examined on 19.01.22. It must be noted that weather conditions prior to the site assessment taking place was generally wet and windy conditions.</i>
Lakes	<i>None occur within 10m of the ppa.</i>
Beaches/Shellfish Areas	<i>None occur within 200m of the ppa.</i>
Wetlands	<i>None occur within 200m of the ppa.</i>
Karst Features	<i>None occur within 200m of the ppa.</i>
Watercourses/Streams	<i>None occur within 10m of the ppa.</i>
Drainage Ditches	<i>Drain located >10m north and south from the ppa.</i>
Springs	<i>None occur within 50m from the ppa.</i>

Wells

If a well is to be bored onsite it should be located at least 30m up-gradient from the ppa; this will therefore be outside the minimum separation distances of the Groundwater Protection Responses of GSI/EPA/DoELG and the EPA Code of Practice (2021).

As all the wells in the locality will therefore meet the required separation distances of the Groundwater Protection Responses of GSI/EPA/DoELG and the EPA Code of Practice (2021), none are deemed to be at risk from the proposed polishing filter's installation.

Integrate the information above in order to comment on:

1. The potential suitability of the site:

The site still seems suitable for discharge to ground.

2. Potential targets at risk:

Following the desk study surface water was thought not to be at risk; this was corroborated during the visual assessment.

There appears to be few issues with respect to impermeability. From this, surface water does not seem to be a potential target,

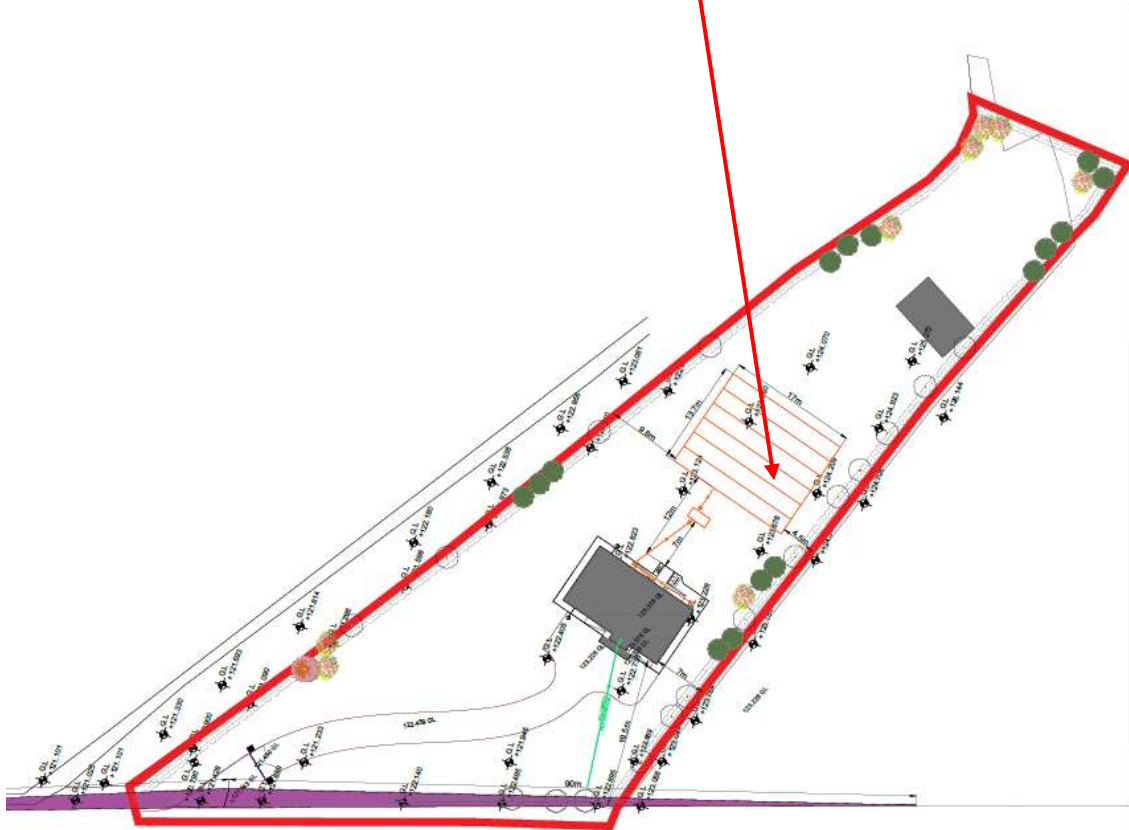
Groundwater is still a target following the visual assessment, unless the minimum depths required are met on the site and there exists adequate percolation.

3. The suitability of the site to treat the wastewater:

Following the visual assessment it is seen that all appropriate separation distances can be met and the site seems well drained, and pending confirmation of the presence of adequate depths of unsaturated soil and subsoil within the percolation area, as well as sufficient percolation rates under the site, the site should be suitable for treating wastewater adequately.

Sketch of site showing measurement to Trial Hole location and Percolation test Hole locations, wells and direction of ground water flow, proposed house (incl. distances from boundaries) adjacent houses, watercourses, significant sites and other features. North point should always be included.
SITE LAYOUT DRAWING SHOWING TEST HOLE LOCATIONS

Approximate Location of Trial Hole & Percolation Test Holes Examined on 19.01.22



3.2 Trial Hole

Depth of Trial Hole

1.10m BGL

Depth from Ground Surface to bedrock (m) if Present

1.10m BGL

Depth from Ground Surface to Water Table (m) if Present

0.90m BGL

Depth of water ingress

0.90m BGL

Rock Type if Present

None Encountered

Date and Time of Excavation

17.01.22 09.00

Date and Time of Examination

19.01.22 09.30

	Depth of surface & subsurface Test	Soil/Subsoil Texture Classification	Plasticity and Dilatancy	Soil Structure	Density Compactness	Colour	Preferential Flowpaths
0.1m	Depth of surface Test	Silt/Clay	Ribbons 60.70.80 2,2,2Threads	Crumb	Medium	Brown	
0.2m							
0.3m							
0.4m							
0.5m	Depth of subsurface Test	Clay Intermixed With stone	Ribbons 100.110.120 3,3,4Threads	Blocky	Medium	Brown	
0.6m							
0.7m							
0.8m							
0.9m							
1.0m							
1.1m							
1.2m							
1.3m							
1.4m							
1.5m							
1.6m							
1.7m							
1.8m							
1.9m							
2.0m							
2.1m							

EVALUATION:

Weather conditions: Dry and Mild

According To The Flowchart For Describing Subsoil's based on BS5930:1999, the subsoil is best described as Clay intermixed with stone

Groundwater was encountered in the trial hole at a depth of 0.90m BGL. Bedrock was encountered in the trial hole at a depth of 1.10m BGL.

Likely Subsurface Percolation Value:

<75.00
min /25mm

Likely Surface Percolation Value:

<75.00
min /25mm

*Note: Depth of percolation test holes should be indicated on log above (Enter Subsurface & Surface Depths as appropriate)

* See Appendix E for BS5930 Classification

** 3 samples to be tested

*** All signs of mottling should be recorded.

3.3a Subsurface Percolation Test for Subsoil

Step 1 Test Hole Preparation

Percolation Test Hole	1	2	3
Depth from ground surface to top of hole (mm) (A):	150	150	150
Depth from ground surface to base of hole (mm) (B):	550	550	550
Depth of hole (mm) (B-A):	400	400	400
Dimensions of hole [length x breadth (mm)]:	300 x 300	300 x 300	300 x 300

Step 2 Pre-Soaking Test Holes

Pre-soak start	Date	18.01.22	18.01.22	18.01.22
	Time	09.55	09.55	09.55
2nd pre-soak start	Date	18.01.22	18.01.22	18.01.22
	Time	14.50	14.50	14.50

Each hole should be pre-soaked twice before the test is carried out. Each hole should be empty before refilling.

Step 3 Measuring T₁₀₀

Percolation Test Hole	1	2	3
Date of Test	19.01.22	19.01.22	19.01.22
Time Filled to 400mm	10.00	10.00	10.00
Time Water Level at 300mm	14.14	14.23	14.31
Time to drop 100mm (T ₁₀₀)	254.00	263.00	271.00
Average T ₁₀₀			262.60

If T₁₀₀ > 480mins then Subsurface Percolation value > 120 – site unsuitable for discharge to ground
 If T₁₀₀ ≤ 210mins then go to Step 4
 If T₁₀₀ ≥ 210mins then go to Step 5

Step 4 Standard Method (where $T_{100} \leq 210\text{min}$)

Percolation Test Hole	1			2			3		
	Start Time at 300mm	Finish Time at 200mm	Δt (min)	Start Time at 300mm	Finish Time at 200mm	Δt (min)	Start Time at 300mm	Finish Time at 200mm	Δt (min)
1									
2									
3									
Average Δt									
	Average $\Delta t/4 =$ [Hole No. 1]			Average $\Delta t/4 =$ [Hole No. 2]			Average $\Delta t/4 =$ [Hole No. 2]		
Result of Test: Subsurface Percolation Value:									min/25mm
Comments									

Step 5 Modified Method (where $T_{100} > 210\text{min}$)

Percolation Test Hole No	1					
Fall of Water In Hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f/T_m$	T-value = $4.45/K_{fs}$
300 – 250	8.1	14.15	16.37	142	0.06	78.01
250 – 200	9.7	16.38	19.06	148	0.07	67.90
200 – 150	11.9	19.07	21.44	157	0.08	58.71
150 - 100	14.1	21.45	00.26	161	0.09	50.81
Average	T-Value	T-Value Hole 1 = (T_1)				63.86

Percolation Test Hole No	2					
Fall of Water In Hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f/T_m$	T-value = $4.45/K_{fs}$
300 – 250	8.1	14.24	16.50	146	0.05	80.21
250 – 200	9.7	16.51	19.32	153	0.06	70.19
200 – 150	11.9	19.25	22.08	163	0.07	60.95
150 - 100	14.1	22.09	01.03	174	0.08	54.91
Average	T-Value	T-Value Hole 2 = (T_2)				66.57

Percolation Test Hole No	3					
Fall of Water In Hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f/T_m$	T-value = $4.45/K_{fs}$
300 – 250	8.1	14.32	17.02	150	0.05	82.41
250 – 200	9.7	17.03	19.47	164	0.06	75.24
200 – 150	11.9	19.48	22.41	173	0.07	64.69
150 - 100	14.1	22.42	01.41	179	0.08	56.49
Average	T-Value	T-Value Hole 3 = (T_3)				69.71

Result of Test: Subsurface Percolation Value = 66.71min/25mm.

Comments

Average Percolation Characteristics of the Subsoil Material.

3.3b Surface Percolation for Soil

Step 1 Test Hole Preparation

Percolation Test Hole	1	2	3
Depth from ground surface to top of hole (mm) (A):	0	0	0
Depth from ground surface to base of hole (mm) (B):	400	400	400
Depth of hole (mm) (B-A):	400	400	400
Dimensions of hole [length x breadth (mm)]:	300 x 300	300 x 300	300 x 300

Step 2 Pre-Soaking Test Holes

Pre-soak start	Date	18.01.22	18.01.22	18.01.22
	Time	10.05	10.05	10.05
2nd pre-soak start	Date	18.01.22	18.01.22	18.01.22
	Time	15.00	15.00	15.00

Each hole should be pre-soaked twice before the test is carried out. Each hole should be empty before refilling.

Step 3 Measuring T₁₀₀

Percolation Test Hole	1	2	3
Date of Test	19.01.22	19.01.22	19.01.22
Time Filled to 400mm	10.10	10.10	10.10
Time Water Level at 300mm	13.01	13.05	13.12
Time to drop 100mm (P ₁₀₀)	171.00	175.00	182.00
Average T ₁₀₀	176.00		

If T₁₀₀ > 480 minutes then Surface Percolation value > 90 – site unsuitable for discharge to ground
 If T₁₀₀ ≤ 210 mins then go to Step 4
 If T₁₀₀ ≥ 210 mins then go to Step 5

Step 4 Standard Method (where $T_{100} \leq 210$ min)

Percolation Test Hole	1			2			3		
	Start Time at 300mm	Finish Time at 200mm	Δt (min)	Start Time at 300mm	Finish Time at 200mm	Δt (min)	Start Time at 300mm	Finish Time at 200mm	Δt (min)
1	13.02	15.56	174.00	13.06	16.03	177.00	13.13	16.17	184.00
2	15.57	18.54	177.00	16.04	19.04	180.00	16.18	19.25	187.00
3	18.55	21.57	182.00	19.05	22.10	185.00	19.26	22.37	191.00
Average Δt			177.60			180.60			187.30
	Average $\Delta t/4 =$ [Hole No. 1]		44.42	Average $\Delta t/4 =$ [Hole No. 2]		45.16	Average $\Delta t/4 =$ [Hole No. 2]		46.83
Result of Test : Surface Percolation Value			45.47	min/25mm					
Comments									
<p>Result of Surface Percolation: 45.47 min/25mm.</p> <p>Average Percolation Characteristics of the Subsoil Material.</p>									

4.0 CONCLUSIONS of SITE CHARACTERISATION:

Integrate the information from the desk study and on-site assessment (i.e. visual assessment, trial hole and percolation tests) above and conclude the type of system(s) that is (are) appropriate. This information is also used to choose the optimum final disposal route of the treated wastewater.

Slope of Proposed Infiltration/treatment area	1.200
Are all minimum separation distance met?	Yes
Depth of unsaturated soil and/or subsoil beneath invert of gravel (or drip tubing in the case of drip dispersal system)	0.90m
Percolation test results: Surface:	45.47min/25mm
Sub-surface:	66.71min/25mm
Not suitable for Development <input type="checkbox"/>	Suitable for Development <input checked="" type="checkbox"/>

Identify all suitable options	Discharge Route
1. Septic tank System (Septic tank and percolation area) (Chapter 7) <input type="checkbox"/>	Groundwater
2. Secondary Treatment System (Chapters 8 and 9) and soil polishing filter (Section 10.1) <input checked="" type="checkbox"/>	
3. Tertiary Treatment System and Infiltration/treatment area (Section 10.2) <input checked="" type="checkbox"/>	

5.0 RECOMMENDATION:

Propose to install	<i>Traynor Environmental recommends that an O'Reilly Oakstown Treatment System or similar manufactured EN certified system into 500mm wide trenches (Option 3 EPA Code of Practice 2021).</i>
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And discharge to	<i>Groundwater</i>
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Invert level of the trench/bed gravel or drip tubing (m)	<i>0.30m Above Ground Level (AGL)</i>
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Site Specific Conditions (if any) e.g. special works, Site Improvement Works, Testing etc.
<p><i>The tests showed that the site has a Sub-surface value rating of 66.71min/25mm indicating average percolation characteristics of the subsoil. Sub-surface. A Surface value rating of 45.47 min/25mm was attained indicating average percolation characteristics of the topsoil. Groundwater was encountered in the trial hole at a depth of 1.10m BGL. Winter Groundwater was encountered in the trial hole at a depth of 0.90m BGL Bedrock was not encountered in the trial hole.</i></p> <p><i>A purpose-built polishing filter should be constructed to ensure that there is a minimum of 0.90m of suitable percolating material between the base of the lowest part of the percolation area at all times. The distribution pipes used in this system will be smooth walled, have a diameter of 100mm, have 8mm holes drilled in them 75mm apart, and each pipe should be spaced parallel and 2500mm centre to centre apart.</i></p> <p><i>Traynor Environmental Ltd also recommends that the O' Reilly Oakstown Treatment System and polishing filter construction is overseen by a suitable qualified and accredited person</i></p>

6.0 TREATMENT SYSTEM DETAILS

SYSTEM TYPE: Septic Tank System (Chapter 7)

Tank Capacity (m²)

N/A

Percolation Area

Mound Percolation Area

No. of Trenches

N/A

No. of Trenches

N/A

Length of Trenches (m)

N/A

Length of Trenches (m)

N/A

Invert Level (m)

N/A

Invert Level (m)

N/A

SYSTEM TYPE: Secondary Treatment System (Chapters 8 and 9) and polishing filter (Section 10.1)

Secondary Treatment Systems receiving septic tank effluent (Chapter 8)

Media Type	Area (m ²)	Deep of Filter (m)	Invert Level (m)
Sand/Soil	N/A	N/A	N/A
Soil	100m (10No. 10m Trenches)	300mm	0.30m AGL
Constructed Wetland	N/A	N/A	N/A
Other	N/A	N/A	N/A

Package Treatment Systems receiving raw wastewater (Chapter 9)

Type	<i>O' Reilly Oakstown Treatment System</i>
Capacity PE	8PE
Sizing of Primary Compartment	
	m ²

Polishing Filter: (Section 10.1)

Surface Area Sand Filter (m ²)	N/A		No. of Trenches	N/A
Option 1 – Direct Discharge Surface area (m ²)	N/A		Length of Trenches (m)	N/A
Option 2 – Pumped Discharge Surface Area (m ²)	N/A		Invert Level (m)	N/A

SYSTEM TYPE: Treatment System and infiltration/ treatment area (section 10.2)

Identify purpose of tertiary treatment

Provide performance information demonstrating system will provide required treatment levels

Provide design information

O' Reilly Oakstown Treatment System and gravity fed into 500mm wide trenches.

DISCHARGE ROUTE:

Groundwater	✓		Hydraulic Loading Rate (l/m ² . d)	900	Surface Area (m ²)	
Surface Water			Discharge Rate (m ³ /hr)	0.009		

QUALITY ASSURANCE:

Installation & Commissioning

Recommend to be overseen by plant supplier.

On-going Maintenance

Maintain and de-sludge annually

7.0 SITE ASSESSOR DETAILS

Company:	Traynor Environmental Ltd				
Prefix:	Mr.	First Name:	Nevin	Surname:	Traynor
Address:	Belturbet Business Park, Creeny, Belturbet, Co. Cavan.				
Qualifications/Experience:	BSc. Env, H.Dip I.T, Cert SHWW, EPA/FAS Course Certified Professional Indemnity Insurance Holder (€1 million cover)				
Date of Report:	17.02.22				
Phone:	049 9522236	Fax:	049 9522808	E-mail:	nevin@traynorenvironmental.com
Indemnity Insurance Number:	20/1/04786 (Renewed 12 th July 2021)				

Signed:



Nevin Traynor

BSc. Env, H.Dip I.T, Cert SHWW, EPA/FAS Cert.

For Traynor Environmental Ltd

8.0 SITE PHOTOGRAPHS

Facing North From the Trial Hole Excavation



Facing West From the Trial Hole Excavation



Facing South From the Trial Hole Excavation



Facing East From the Trial Hole Excavation



Trial Hole – Side View



Trial Hole – Front View



Percolation ("Subsurface") Test 1



Percolation ("Subsurface") Test 2



Percolation ("Subsurface") Test 3



Percolation ("Surface") Test 1



Percolation ("Surface") Test 2

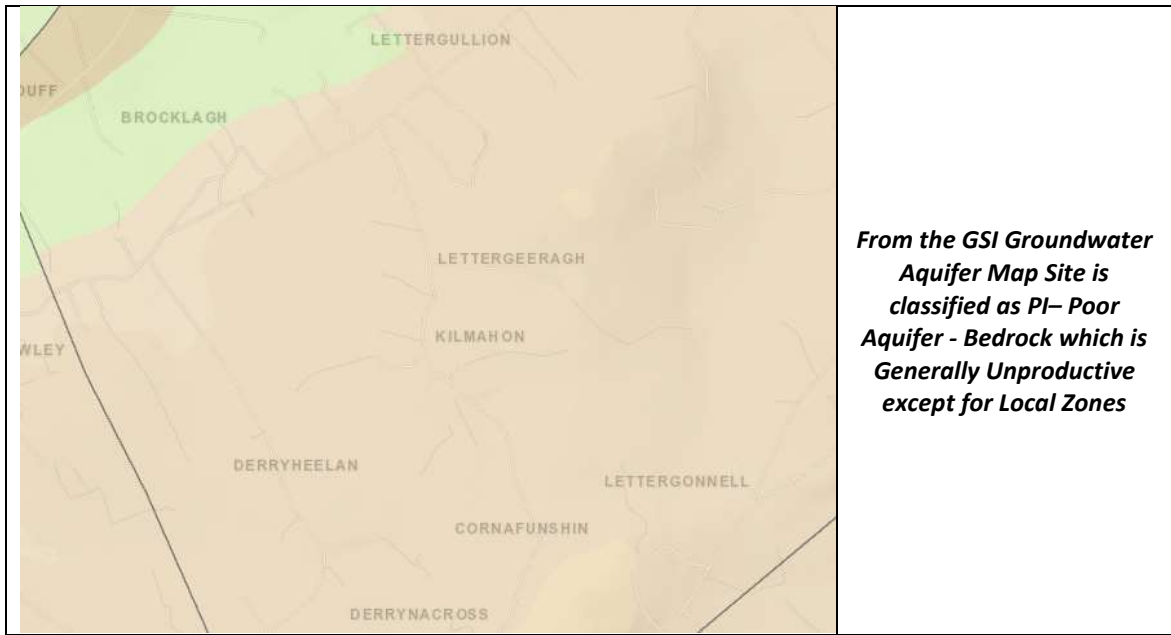


Percolation ("Surface") Test 3

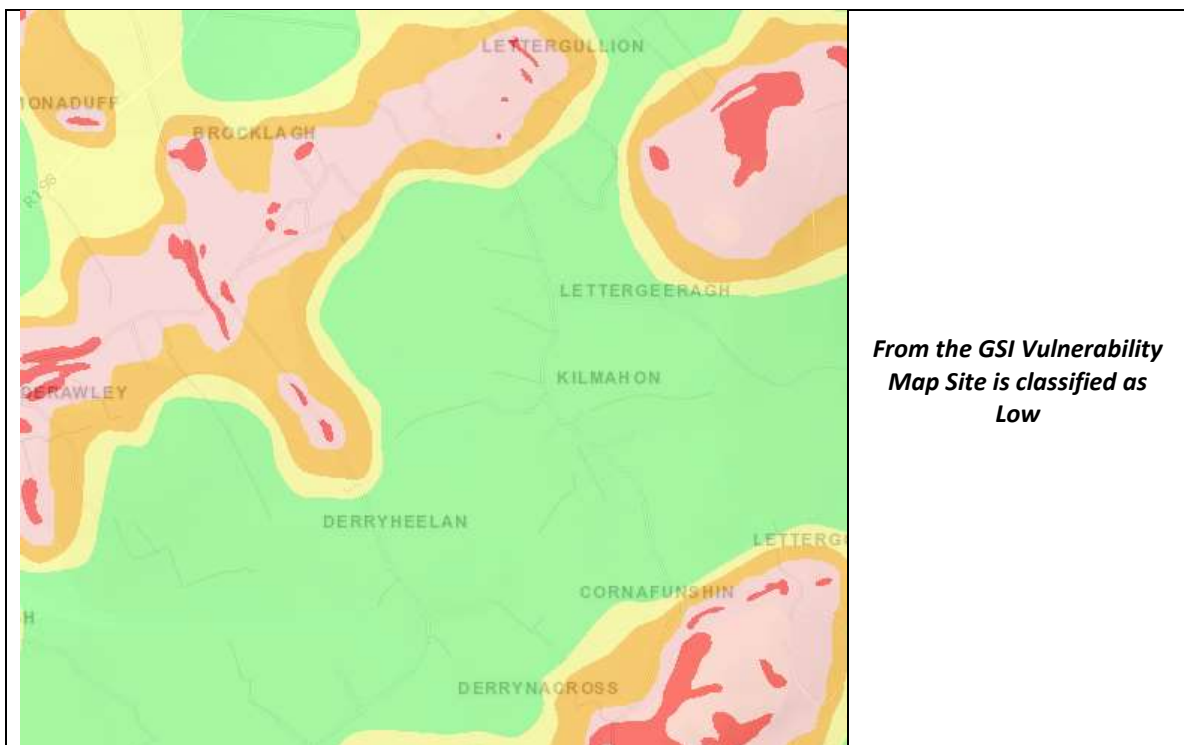


Maps Used As Part of the EPA Site Suitability Assessment

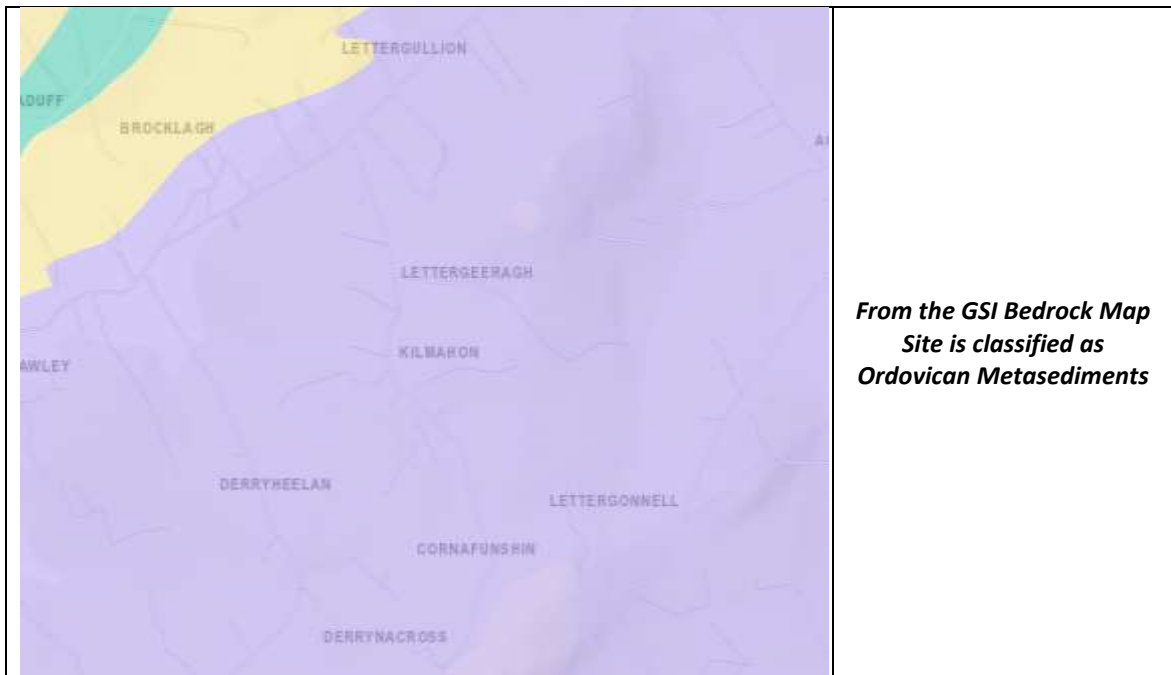
Groundwater/Aquifer Map



Vulnerability Map

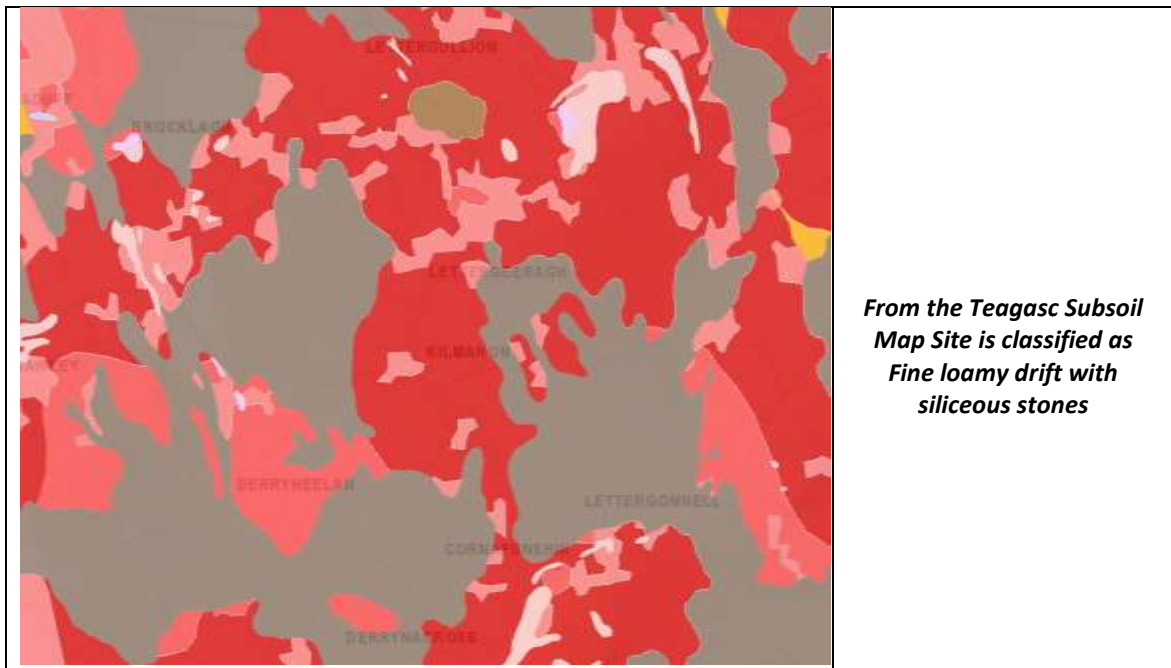


Bedrock Map



*From the GSI Bedrock Map
Site is classified as
Ordovician Metasediments*

Teagasc Subsoil Map



*From the Teagasc Subsoil
Map Site is classified as
Fine loamy drift with
siliceous stones*



10.0 P.I INSURANCE

Griffiths & Armour Europe DAC

Alexandra House
The Sweepstakes
Ballsbridge
Dublin 4

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+353 (0)1 634 9001
info@griffithsandarmour.com
griffithsandarmour.com



PROFESSIONAL INDEMNITY INSURANCE

We confirm the following details relating to our client's Professional Indemnity Insurance:

Insured: Traynor Environmental Ltd

Address: Belturbet Business Park
Creery
Belturbet
Co. Cavan
H14AY94

Lead Insurer(s): Axis Specialty Europe SE

Period of Insurance: 12 July 2021 to 11 July 2022

Policy Number: 20/1/04786

Limit of Indemnity: €1,500,000 any one claim and unlimited in the period of insurance

Signed:

Graeme Tinney
Chief Executive Officer
Griffiths & Armour Europe DAC

Date: 22 June 2021

The policy is subject to the insuring agreements, exceptions, exclusions, limitations, conditions and declarations contained therein. The above is accurate at the date of signature. No obligation is imposed herein on the signatory to advise of any alteration.

Directors: G Tinney C Evans (UK) D J Whalley (UK) T Cosgrove (Non-Executive)
Registered in Ireland No. 632268
Registered Office: Q House 108 Furze Road Sandycove Dublin 18 Ireland
Griffiths & Armour Europe Designated Activity Company is regulated by the Central Bank of Ireland

Disclosure

PROPOSAL

FOR

A

O'REILLY OAKSTOWN TREATMENT SYSTEM

PREPARED

FOR

LONGFORD COUNTY COUNCIL

LETTERGEERAGH

DRUMLISH

CO. LONGFORD