



SOIL CHARACTERISATION AND
SITE SUITABILITY ASSESSMENT REPORT
TE REF: 21/712B TE

BRIAN DUNNE
LYNBROOK
WHITECHURCH RD
RATHFARNHAM
DUBLIN 16
SITE B

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)	Brian Dunne
Address of Correspondance	Site Location and Townland
c/o McCrae Consulting Engineers Rear 6B Arbourfield Terrace, Dundrum Business Park, Dublin 14, D14 F5C6	Lynbrook Whitechurch Rd Rathfarnham Dublin 16

Number of Bedrooms **Maximum Number of Residents:**

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):

Subsoil, (Specify Type):

Bedrock Type:

Aquifer Category: Regionally Important Locally Important Poor

Vulnerability: Extreme High Moderate Low

Groundwater Body: **Status**

Name of Public/Group Scheme Water Supply within 1km:

Source Protection Area: ZOC SI SO **Groundwater Protection Response:**

Presence of Significant sites (Archaeological, natural and historical):

Past experience in the area:

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 Grey Brown Podzolics (75% 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 North direction</i>			

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

Houses	<i>Neighbouring house located >10m south, from the proposed percolation area (ppa).</i>
Existing Land Uses	<i>Garden Area</i>
Vegetation Indicators	<i>Grass is the predominant vegetation in the ppa and throughout the site.</i>
Groundwater Flow Directions	<i>North Direction</i>
Ground Condition	<i>Ground conditions are best described as dry and firm in the ppa.</i>
Site Boundaries	<i>Hedge is located to the north & west of the ppa. Garden located to the south of the ppa. Hedge & local road is located to the east of the ppa.</i>
Roads	<i>Located road located >10m east 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 24.09.21. It must be noted that weather conditions prior to the site assessment taking place was generally dry and mild 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>Stream located >10m north & east of the ppa.</i>
Drainage Ditches	<i>None occur within 10m of 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.

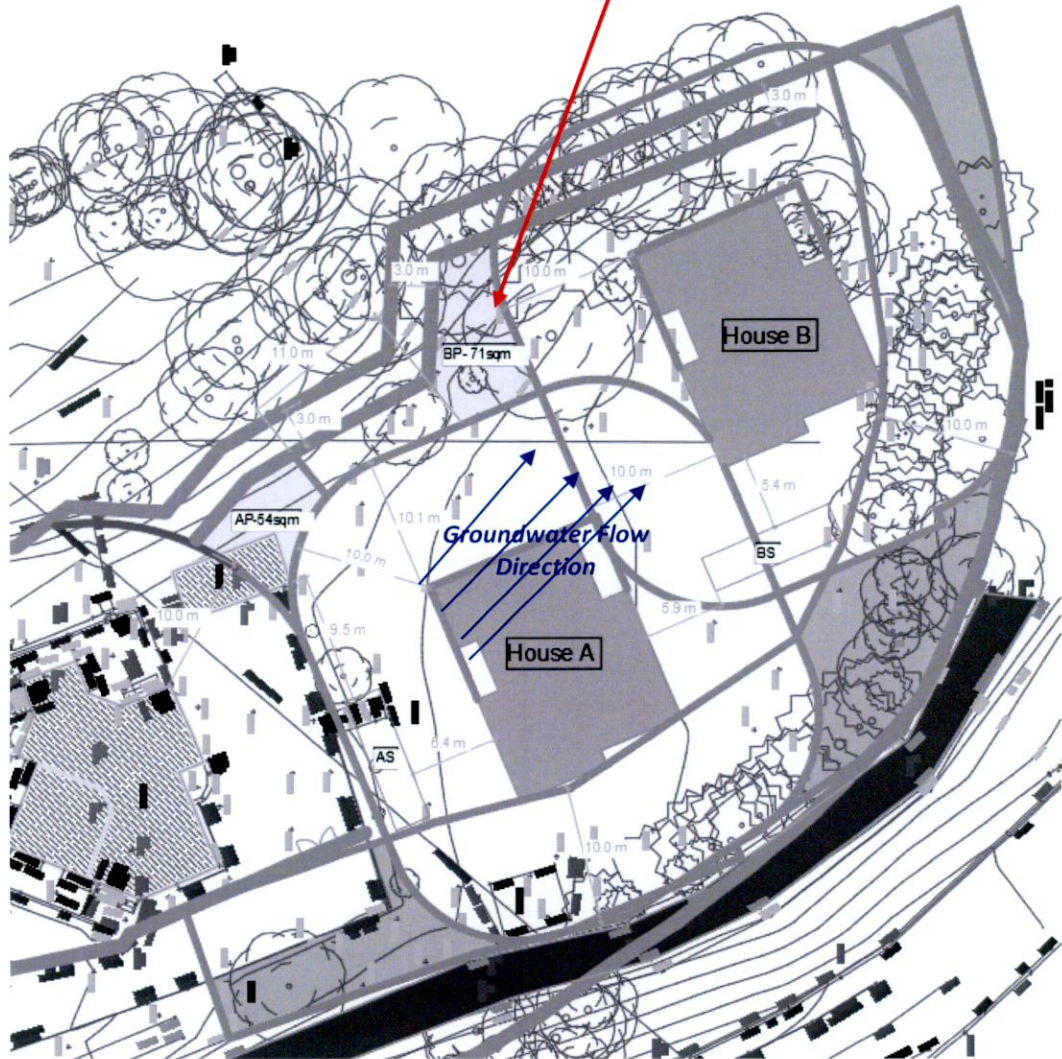
3. The suitability of the site to treat the wastewater:

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 24.09.21



3.2 Trial Hole

Should be a minimum 2.10m deep

Depth of Trial Hole	2.10m BGL				
Depth from Ground Surface to bedrock (m) if Present	None Encountered	Depth from Ground Surface to Water Table (m) if Present	1.30m BGL		
Depth of water ingress	1.10m BGL	Rock Type if Present	None Encountered		
Date and Time of Excavation	22.09.21	09.00	Date and Time of Examination	24.09.21	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 30.40.50 1,1,2Threads	Crumb	Low	Brown	
0.2m							
0.3m							
0.4m	Depth of subsurface Test	Clay intermixed with stone	Ribbons 50.60.70 2,2,2Threads	Blocky	Medium	Brown	
0.5m							
0.6m							
0.7m							
0.8m		Gravel intermixed with stone	Ribbons 10.10.10 1,1,1Threads	Crumb	Low	Grey	
0.9m							
1.0m							
1.1m							
1.2m		WWT	WWT	WWT	WWT	WWT	WWT
1.3m							
1.4m		GWT	GWT	GWT	GWT	GWT	GWT
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 & Gravel

Groundwater was encountered in the trial hole at a depth of 1.30m BGL. Winter Groundwater was encountered in the trial hole at a depth of 1.10m BGL. Bedrock was not encountered in the trial hole.

Likely Subsurface Percolation Value:	<50.00 min /25mm
Likely Surface Percolation Value:	<50.00 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):	300	300	300
Depth from ground surface to base of hole (mm) (B):	700	700	700
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	23.09.21	23.09.21	23.09.21
	Time	11.05	11.05	11.05
2nd pre-soak start	Date	23.09.21	23.09.21	23.09.21
	Time	16.50	16.50	16.50

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	24.09.21	24.09.21	24.09.21
Time Filled to 400mm	12.00	12.00	12.00
Time Water Level at 300mm	13.48	13.53	14.00
Time to drop 100mm (T ₁₀₀)	108.00	113.00	120.00
Average T ₁₀₀			113.60

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	13.49	15.40	111.00	13.54	15.50	116.00	14.01	16.05	124.00
2	15.41	17.36	115.00	15.51	17.50	119.00	16.06	18.14	128.00
3	17.37	19.38	121.00	17.51	19.57	126.00	18.15	20.28	133.00
Average Δt			115.60			120.30			128.30
	Average $\Delta t/4 =$ [Hole No. 1]		28.92	Average $\Delta t/4 =$ [Hole No. 2]		30.08	Average $\Delta t/4 =$ [Hole No. 2]		32.08
Result of Test: Subsurface Percolation Value:			30.36	min/25mm					

Comments

Result of Subsurface Percolation: 30.36min/25mm.
Good Percolation Characteristics of the Surface 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	23.09.21	23.09.21	23.09.21
	Time	11.10	11.10	11.10
2nd pre-soak start	Date	23.09.21	23.09.21	23.09.21
	Time	17.00	17.00	17.00

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	24.09.21	24.09.21	24.09.21
Time Filled to 400mm	12.10	12.10	12.10
Time Water Level at 300mm	13.29	13.34	13.42
Time to drop 100mm (P ₁₀₀)	79.00	84.00	92.00
Average T ₁₀₀			85.00

If T₁₀₀ > 480 minutes then Surface Percolation value > 90 – 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		
Fill No.	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	13.30	14.52	82.00	13.35	15.02	87.00	13.43	15.19	96.00
2	14.53	16.18	85.00	15.03	16.32	89.00	15.20	16.59	99.00
3	16.19	17.50	91.00	16.33	18.07	94.00	17.00	18.44	104.00
Average Δt			86.00			90.00			99.60
	Average $\Delta t/4 =$ [Hole No. 1]		21.50	Average $\Delta t/4 =$ [Hole No. 2]		22.50	Average $\Delta t/4 =$ [Hole No. 2]		24.92
Result of Test : Surface Percolation Value	22.97		min/25mm						

Comments

**Result of Subsurface Percolation: 22.97min/25mm.
Good Percolation Characteristics of the Surface Material.**

5.0 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:	22.97min/25mm
Sub-surface:	30.36min/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"/>	<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 an O'Reilly Oakstown Treatment System or similar manufactured EN certified system and sand filter with gravel base layer. This will provide the site with tertiary effluent treatment.</i>
And discharge to	<i>Groundwater</i>
Invert level of the trench/bed gravel or drip tubing (m)	<i>0.90m Above Ground Level (AGL)</i>

Site Specific Conditions (if any) e.g. special works, Site Improvement Works, Testing etc.

The tests showed that the site has a Sub-surface value rating of 30.36min/25mm indicating average percolation characteristics of the Sub-surface. A surface value rating of 22.97 min/25mm was attained indicating good percolation characteristics of the surface. Groundwater was encountered in the trial hole at a depth of 1.30m BGL. Winter Groundwater was encountered in the trial hole at a depth of 1.10m BGL. Bedrock was not encountered in the trial hole. A purpose-built sand polishing filter and gravel layer 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 gravel base at all times. The distribution pipes used in this system will be smooth walled, have a diameter of 25mm, have 8mm holes drilled in them 300mm apart, and each pipe should be spaced parallel and 1000mm centre to centre apart. A gravel layer will also be required under the sand filter.

Traynor Environmental Ltd also recommends that the O' Reilly Oakstown Treatment System and sand polishing filter and gravel bed construction is overseen by a suitable qualified and accredited person.

6.0 TREATMENT SYSTEM DETAILS

SYSTEM TYPE: Septic Tank System (Chapter 7)

Tank Capacity (m ²)	N/A	<i>Percolation Area</i>	<i>Mound Percolation Area</i>
		<i>No. of Trenches</i>	<i>No. of Trenches</i>
		N/A	N/A
		<i>Length of Trenches (m)</i>	<i>Length of Trenches (m)</i>
		N/A	N/A
		<i>Invert Level (m)</i>	<i>Invert Level (m)</i>
		N/A	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)				Package Treatment Systems receiving raw wastewater (Chapter 9)	
Media Type	Area (m ²)	Deep of Filter (m)	Invert Level (m)		
Sand/Soil	N/A	N/A	N/A	Type	N/A
Soil	N/A	N/A	N/A	Capacity PE	N/A
Constructed Wetland	N/A	N/A	N/A	Sizing of Primary Compartment	
Other	N/A	N/A	N/A	N/A	m ²

Polishing Filter: (Section 10.1)

Surface Area Sand Filter (m ²)	15	<i>No. of Trenches</i>	N/A
Option 1 – Direct Discharge Surface area (m ²)	45	<i>Length of Trenches (m)</i>	N/A
Option 2 – Pumped Discharge Surface Area (m ²)	N/A	<i>Invert Level (m)</i>	0.90m AGL

SYSTEM TYPE: O'Reilly Oakstown 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 sand polishing filter with gravel layer	

DISCHARGE ROUTE:

Groundwater	<input checked="" type="checkbox"/>	Hydraulic Loading Rate (l/m2. d)	900	Surface Area (m ²)	
Surface Water	<input type="checkbox"/>	Discharge Rate (m ³ /hr)	0.009		

QUALITY ASSURANCE:

Installation & Commissioning	On-going Maintenance
Recommend to be overseen by plant supplier.	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:

30.09.21

Phone:

049 9522236

Fax:

049 9522808

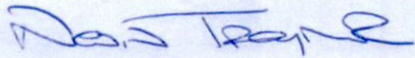
E-mail:

nevin@traynorenvironmental.com

Indemnity Insurance Number:

20/1/04786 (Renewed 12th July 2021)

Signed:



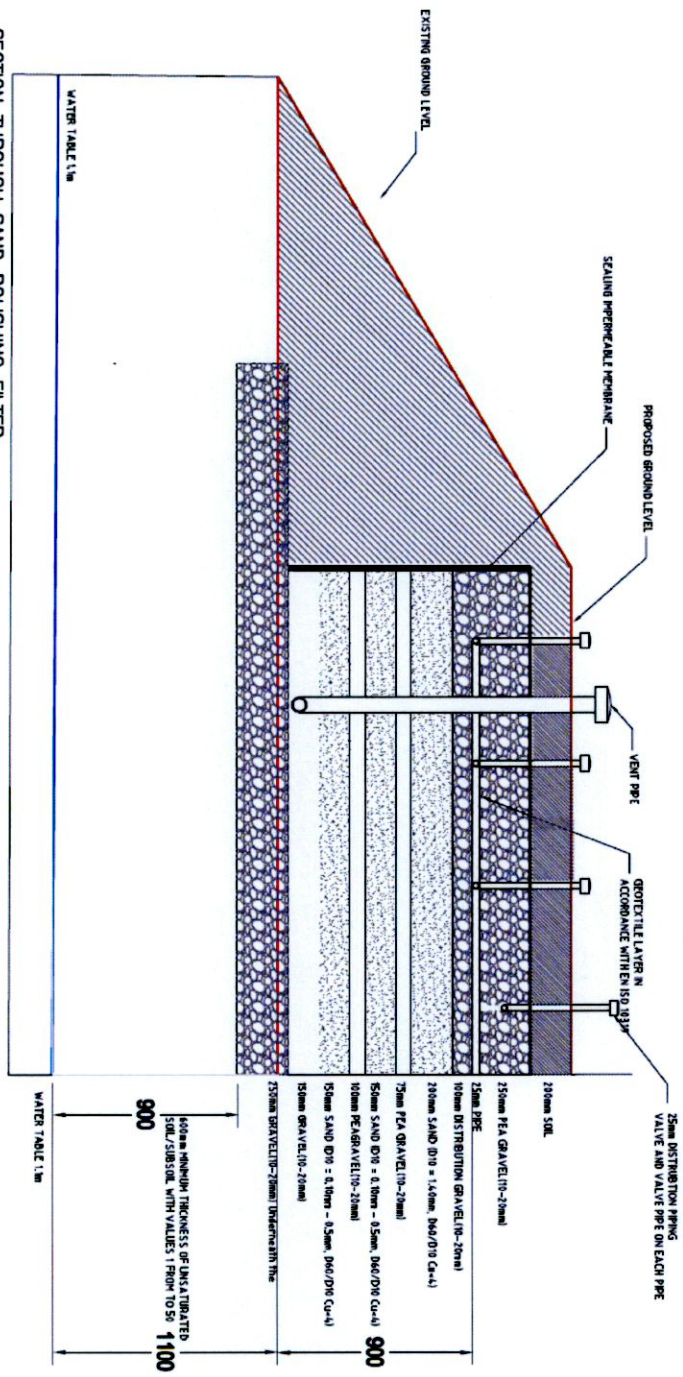
Nevin Traynor

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

For Traynor Environmental Ltd

Cross Section

SECTION THROUGH SAND POLISHING FILTER
SCALE: 1:50



8.0 SITE PHOTOGRAPHS

Facing South From the Trial Hole Excavation



Facing North From the Trial Hole Excavation



Facing West From the Trial Hole Excavation



Facing East From the Trial Hole Excavation



Trial Hole – Front View



Trial Hole – Side View



Percolation ("Sub-surface") Test 1



Percolation ("Sub-surface") Test 2



Percolation ("Sub-surface") Test 3



Percolation ("surface") Test 1



Percolation ("surface") Test 2



Percolation ("surface") Test 3



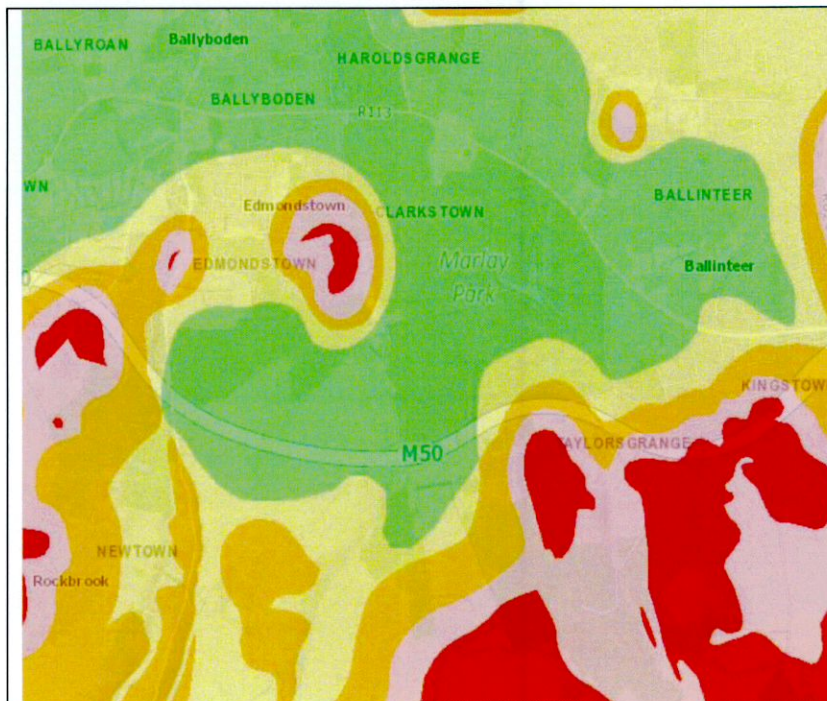
Maps Used As Part of the EPA Site Suitability Assessment

Groundwater/Aquifer Map



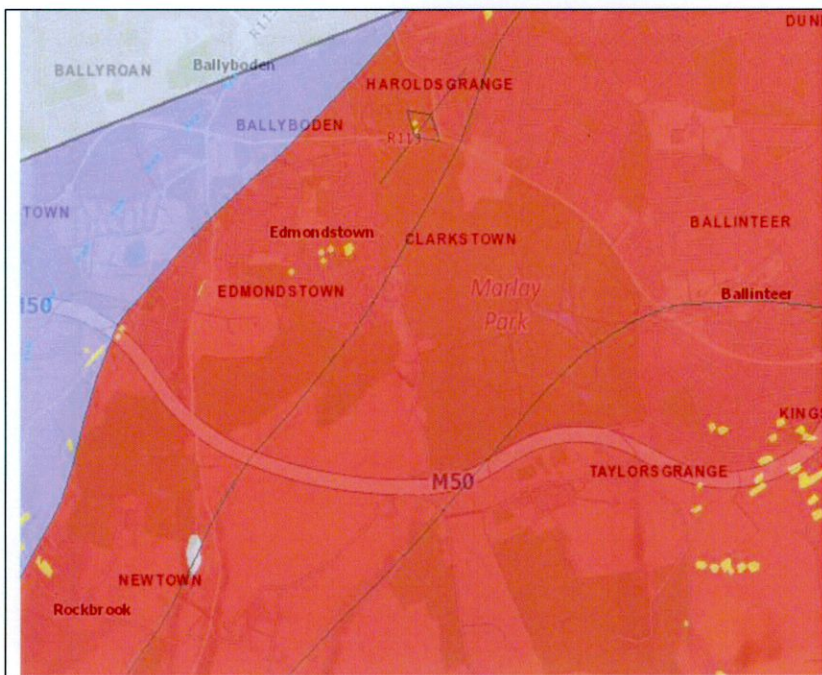
From the GSI Groundwater Aquifer Map Site is classified as PI- Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones

Vulnerability Map



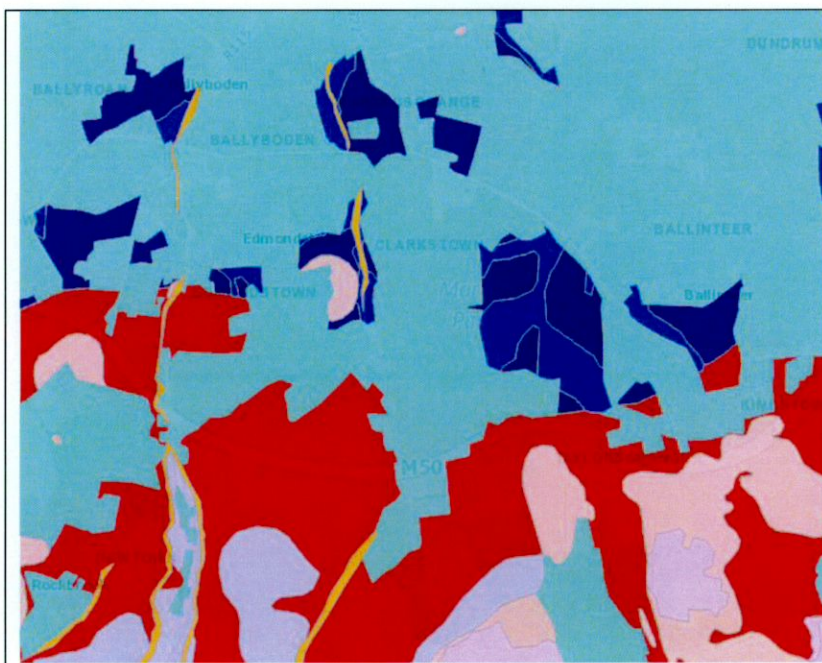
From the GSI Vulnerability Map Site is classified as Low

Bedrock Map



From the GSI Bedrock Map the Site is classified as GII-Granites & other Igneous Intrusive rocks

Teagasc Subsoil Map



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



F/NSC 003535



Forbairt na rannacha
Beitioscáil agus Oibris

National Skills Certificate (FÁS)

Awarded to
Bronnta ar

Nevin Traynor

who has achieved the National Standards for
a bhain Caighdeán Náisiúnta amach maidir le
Site Suitability Assessment for On-Site

Wastewater Treatment Systems

John O'Connor
Chief, FETAC

Stam Ue Urygh
Chief Executive, FETAC



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PROFESSIONAL INDEMNITY INSURANCE

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

Insured: Traynor Environmental Ltd

Address: Belturbet Business Park
Creeny
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 Sandycroft 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

BRIAN DUNNE

LYNBROOK

WHITECHURCH RD

RATHFARNHAM

DUBLIN 16

SITE B