

Galway County Council

**Meelick, Williamstown
Co. Galway F45 FW95**

Site Characterisation Assessment Report

April / 2026

0615-MFA-SCA-RP-100-01

**DESIGNING A
SUSTAINABLE
FUTURE**



CIVIL | STRUCTURAL | ROADS | PROJECT MANAGEMENT

APPENDIX A
SITE CHARACTERISATION FORM

APPENDIX A: SITE CHARACTERISATION FORM

File Reference:

1.0 GENERAL DETAILS (From planning application)

Prefix: First Name: Surname:

Address: Site Location and Townland:
ITM Co-ordinates: 559902, 766762

Number of Bedrooms: Maximum Number of Residents:

Comments on population equivalent

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 1 km:

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

Presence of Significant Sites
(Archaeological, Natural & Historical):

Past experience in the area:

Comments:

(Integrate the information above in order to comment on: the potential suitability of the site, potential targets at risk, and/or any potential site restrictions).

The potential targets at risk include groundwater.

The site appears to be potentially suitable for a standard on-site treatment system, provided that trial hole and percolation data are satisfactory. It must meet the requirements for an R1 groundwater response - meaning it is acceptable, subject to adherence to normal good practice, including system selection, construction, operation, and maintenance in accordance with the EPA Code of Practice for Domestic Waste Water Treatment System (DWWTS).

Note: Only information available at the desk study stage should be used in this section.

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment

Landscape Position: The site is located on relatively flat land. Site has a gentle elevation change from west to east.

Slope: Steep (>1:5) ☐ Shallow (1:5-1:20) ☐ Relatively Flat (<1:20) ☒

Slope Comment Gentle Slope

Surface Features within a minimum of 250m (Distance To Features Should Be Noted In Metres)

Houses:

2 No. Houses within 250m of this site.

Existing Land Use:

Existing dwelling house is vacant as of January 2025. Storm Éowyn caused severe damage to the structure, lifting the roof off the building allowing for water ingress.

Vegetation Indicators:

Grasses.

Groundwater Flow Direction: Potentially West to East (ground slopes down in the direction).

Ground Condition:

Ground was dry and firm under foot.

Site Boundaries:

Site boundaries are made up of a combination of masonry walls and hedgerows with a section of trees near the rear of the dwelling. Access road is located at the northeast of the property.

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Roads:

L2201 Meelick road is adjacent the property. Local access road comes off the L2201, allowing for access to the property. L2201 continues northwards to join the R360. In a southbound direction, the L2201 joins up to the R362.

Outcrops (Bedrock And/Or Subsoil):

None within 250m of the site.

Surface Water Ponding:

None identified on the day of the test.

Lakes:

Polleagh Lake located approx. 2.4km from the site.

Beaches/Shellfish Areas:

N/A

Wetlands:

Meelick Knockauns Cutifadda Cutover Complex located approx. 300m east from the site.
Meelick Ballinphull Cutover Bogs located approx. 400m west from the site.

Karst Features:

None within 250m of this site.

Watercourses/Streams:*

Streams within 250m of the site.

*Note and record water level

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Drainage Ditches:*

Drainage Ditch within 150m of the site.

Springs:*

None identified on site. None within 250m of this site as per GSI Mapping.

Wells:*

None identified on site. None within 250m of this site as per GSI Mapping.
Well located approx. 1.6km from the site, used for agricultural and domestic purposes.

Comments:

(Integrate the information above in order to comment on: the potential suitability of the site, potential targets at risk, the suitability of the site to treat the wastewater and the location of the proposed system within the site).

- The site appears suitable for on-site wastewater treatment.
- The size of the site may affect the type of on-site wastewater treatment.
- Groundwater is the potential target at risk.
- The ground was firm and dry underfoot, indicating free drainage.
- The site has a very gentle slope, descending towards the east.

*Note and record water level

3.2 Trial Hole (should be a minimum of 2.1m deep (3m for regionally important aquifers))

To avoid any accidental damage, a trial hole assessment or percolation tests should not be undertaken in areas which are at or adjacent to significant sites, (e.g. NHAs, SACs, SPAs, and/or Archaeological etc.), without prior advice from National Parks and Wildlife Service or the Heritage Service.

Depth of trial hole (m):

Depth from ground surface
to bedrock (m) (if present):

Depth from ground surface
to water table (m) (if present):

Depth of water ingress: Rock type (if present):

Date and time of excavation: Date and time of examination:

Depth of Surface and Subsurface Percolation Tests	Soil/Subsoil Texture & Classification**	Plasticity and dilatancy***	Soil Structure	Density/ Compactness	Colour****	Preferential flowpaths
0.1 m	Topsoil	Slightly plastic	Granular/rooted	Soft to firm	Dark Brown	Roots/root channels
0.2 m	Clayey silt	Plastic	Cohesive	Firm to stiff	Yellow brown	Root channels and stone interfaces
0.3 m						
0.4 m						
0.5 m						
0.6 m	Coarse sand & gravel	Non-plastic	Loose granular	Medium dense	Pale brown	Stone interfaces & fine gravel seems
0.7 m						
0.8 m						
0.9 m						
1.0 m	Trial Pit Depth					
1.1 m						
1.2 m						
1.3 m						
1.4 m						
1.5 m						
1.6 m						
1.7 m						
1.8 m						
1.9 m						
2.0 m						
2.1 m						
2.2 m						
2.3 m						
2.4 m						
2.5 m						
2.6 m						
2.7 m						
2.8 m						
2.9 m						
3.0 m						
3.1 m						
3.2 m						
3.3 m						
3.4 m						
3.5 m						

Likely Subsurface Percolation Value:

Likely Surface Percolation Value:

Note: *Depth of percolation test holes should be indicated on log above. (*Enter Surface or Subsurface at depths as appropriate).

** See Appendix E for BS 5930 classification.

*** 3 samples to be tested for each horizon and results should be entered above for each horizon.

**** All signs of mottling should be recorded.

3.2 Trial Hole (contd.) Evaluation:

Trial pit excavated to approximately 2.1 m BGL. Subsoil generally comprised clayey silt with frequent cobbles/boulders below topsoil. No bedrock was encountered within the trial pit depth. No standing groundwater was observed at the time of inspection. Preferential flowpaths were generally limited to root channels in the upper topsoil/subsoil and stone interfaces and fine gravel seems within the clayey silt.

3.3(a) 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)	550	400	490
Depth from ground surface to base of hole (mm) (B)	1,010	840	890
Depth of hole (mm) [B - A]	460	440	400
Dimensions of hole [length x breadth (mm)]	330 x 320	300 x 290	340 x 360

Step 2: Pre-Soaking Test Holes

Pre-soak start	Date	25-Mar-2026	25-Mar-2026	25-Mar-2026
	Time	10:30	10:35	10:40
2nd pre-soak start	Date	25-Mar-2026	25-Mar-2026	25-Mar-2026
	Time	17:30	17:35	17:40

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

Step 3: Measuring T_{100}

Percolation Test Hole No.	1	2	3
Date of test	26-03-2026	26-03-2026	26-03-2026
Time filled to 400 mm	12:35	12:42	12:43
Time water level at 300 mm	12:40	12:46	12:47
Time (min.) to drop 100 mm (T_{100})	5.00	4.00	4.00
Average T_{100}			4.33

If $T_{100} > 480$ minutes then Subsurface Percolation value >120 – site unsuitable for discharge to ground

If $T_{100} \leq 210$ minutes then go to Step 4;

If $T_{100} > 210$ minutes then go to Step 5;

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

Percolation Test Hole	1			2			3		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)
1	12:46	12:49	3.00	12:40	12:48	8.00	12:47	12:52	5.00
2	12:49	12:57	8.00	12:48	12:58	10.00	12:52	13:02	10.00
3	12:57	13:26	29.00	12:58	13:28	30.00	13:02	13:36	34.00
Average Δt Value			13.33			16.00			16.33
	Average $\Delta t/4 =$ [Hole No.1] 3.33 (t_1)			Average $\Delta t/4 =$ [Hole No.2] 4.00 (t_2)			Average $\Delta t/4 =$ [Hole No.3] 4.08 (t_3)		

Result of Test: Subsurface Percolation Value = 3.81 (min/25 mm)

Comments:

The subsurface percolation value of 3.81 falls within the acceptable range of 3 to 50. Therefore, the site is suitable for the development of a septic tank system or a secondary treatment system discharging to the ground via a percolation area, constructed in accordance with the EPA Code of Practice 2021.

Step 5: Modified Method (where $T_{100} > 210$ minutes)

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			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 1 = (T_1)		0.00	

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			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 2 = (T_2)		0.00	

Result of Test: Subsurface Percolation Value =

0.00 (min/25 mm)

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			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 3 = (T_3)		0.00	

Comments:

3.3(b) Surface Percolation Test for Soil

Step 1: Test Hole Preparation

Percolation Test Hole	1	2	3
Depth from ground surface to top of hole (mm)	0	0	0
Depth from ground surface to base of hole (mm)	480	410	450
Depth of hole (mm)	480	410	450
Dimensions of hole [length x breadth (mm)]	330 x 320	300 x 300	340 x 360

Step 2: Pre-Soaking Test Holes

Pre-soak start	Date	25-Mar-2026	25-Mar-2026	25-Mar-2026
	Time	11:05	11:10	11:15
2nd pre-soak start	Date	25-Mar-2026	25-Mar-2026	25-Mar-2026
	Time	17:05	17:01	17:15

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

Step 3: Measuring T_{100}

Percolation Test Hole No.	1	2	3
Date of test	26-Mar-26	26-Mar-26	26-Mar-2026
Time filled to 400 mm	12:46	13:07	13:29
Time water level at 300 mm	13:16	14:07	13:41
Time to drop 100 mm (T_{100})	30.00	60.00	12.00
Average T_{100}			34.00

If $T_{100} > 480$ minutes then Surface Percolation value >90 – site unsuitable for discharge to ground

If $T_{100} \leq 210$ minutes then go to Step 4;

If $T_{100} > 210$ minutes then go to Step 5;

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

Percolation Test Hole	1			2			3		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)
1	13:01	13:09	8.00	13:29	13:47	18.00	13:41	13:59	18.00
2	13:09	13:20	11.00	13:47	14:13	26.00	13:59	14:23	24.00
3	13:20	13:40	20.00	14:13	17:30	197.00	14:23	14:30	7.00
Average ΔT Value			13.00			80.33			16.33
	Average $\Delta T/4 =$ [Hole No.1] 3.25 (T_1)			Average $\Delta T/4 =$ [Hole No.2] 20.08 (T_2)			Average $\Delta T/4 =$ [Hole No.3] 4.08 (T_3)		

Result of Test: Surface Percolation Value = 9.14 (min/25 mm)

Comments:

The surface percolation value of 9.14 falls within the acceptable range of 3 to 50. Therefore, the site is suitable for the development of a septic tank system or a secondary treatment system discharging to the ground via a percolation area, constructed in accordance with the EPA Code of Practice 2021.

Step 5: Modified Method (where $T_{100} > 210$ minutes)

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			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value	T- Value Hole 1 = (T_1)				0.00

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			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value	T- Value Hole 2 = (T_2)				0.00

Result of Test: Surface Percolation Value =

0.00 (min/25 mm)

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			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value	T- Value Hole 3 = (T_3)				0.00

Comments:

4.0 CONCLUSION 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:

Flat

Are all minimum separation distances met?

✓

Depth of unsaturated soil and/or subsoil beneath invert of gravel (or drip tubing in the case of drip dispersal system)

0.90

Percolation test result: Surface: 3.81

Sub-surface: 9.14

Not Suitable for Development

Suitable for Development

Identify all suitable options

1. Septic tank system (septic tank and percolation area) (**Chapter 7**)
2. Secondary Treatment System (**Chapters 8 and 9**) and soil polishing filter (**Section 10.1**)
3. Tertiary Treatment System and Infiltration / treatment area (**Section 10.2**)

No

Yes

Yes

Discharge Route ¹

Discharge to ground water.

5.0 SELECTED DWWTs

Propose to install:

Tertiary Treatment System and Infiltration /treatment area

and discharge to:

Ground Water

Invert level of the trench/bed gravel or drip tubing (m)

90.35

Site Specific Conditions (e.g. special works, site improvement works testing etc.

The ground conditions meet the requirements specified in the EPA Code of Practice for Domestic Wastewater Treatment Systems, Population Equivalent ≤ 10 . It is recommended that effluent be treated in a secondary wastewater treatment system, followed by a tertiary wastewater system (coconut filter) and gravel distribution layer, before being discharged to ground.

The proposed system will operate via pumped flow to the secondary treatment unit, followed by pressurised distribution to the tertiary wastewater system, and final discharge to a 300 mm deep gravel distribution layer (pea gravel 12–32 mm) in accordance with Section 10.2 of the EPA Code of Practice.

The tertiary infiltration area is sized in accordance with Table 10.1 as follows: $A = 3.75 \times 4 \text{ PE} = 15 \text{ m}^2$. The filtration bed must be laid flat to allow proper infiltration. A minimum of 900 mm of unsaturated subsoil must be present beneath the bed. The pea gravel should be wrapped in Terram, with topsoil reinstated over the area.

All setback distances shall comply with Table 6.2 of the EPA Code of Practice 2021.

¹ A discharge of sewage effluent to "waters" (definition includes any or any part of any river, stream, lake, canal, reservoir, aquifer, pond, watercourse or other inland waters, whether natural or artificial) will require a licence under the Water Pollution Acts 1977-90. Refer to Section 2.4.

6.0 TREATMENT SYSTEM DETAILS

SYSTEM TYPE: Septic Tank Systems (Chapter 7)

Tank Capacity (m ³)		Percolation Area		Mounded Percolation Area	
		No. of Trenches		No. of Trenches	
		Length of Trenches (m)		Length of Trenches (m)	
		Invert Level (m)		Invert Level (m)	

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)*	Depth of Filter	Invert Level
Sand/Soil			
Soil			
Constructed Wetland			
Other			

Packaged Secondary Treatment Systems receiving raw wastewater (Chapter 9)

Type	Tricel Novo IRL6+
Capacity PE	6
Sizing of Primary Compartment	2.40 m ³

Polishing Filter*: (Section 10.1)

Surface Area (m ²)*	15.00	Option 3 - Gravity Discharge Trench length (m)	
Option 1 - Direct Discharge Surface area (m ²)		Option 4 - Low Pressure Pipe Distribution Trench length (m)	
Option 2 - Pumped Discharge Surface area (m ²)		Option 5 - Drip Dispersal Surface area (m ²)	

SYSTEM TYPE: Tertiary 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

DISCHARGE ROUTE:

Groundwater	☒	Hydraulic Loading Rate * (l/m ² .d)		Surface area (m ²)	
Surface Water **	☐	Discharge Rate (m ³ /hr)			

* Hydraulic loading rate is determined by the percolation rate of subsoil

** Water Pollution Act discharge licence required

6.0 TREATMENT SYSTEM DETAILS

QUALITY ASSURANCE:

Installation & Commissioning

The installation is to be supervised by a suitably qualified person and contractor. All works must be inspected and approved by an engineer.

Note: This assessment has been compiled based on an examination of a limited section of the site and test holes. The report presents an opinion on site suitability based on these limited results. No liability can be accepted for changes in conditions that were not revealed by the test holes.

On-going Maintenance

The homeowner should enter into an annual maintenance contract with the treatment unit manufacturer for a minimum period of 10 years or longer, as required.

7.0 SITE ASSESSOR DETAILS

Company: MFA Consulting Engineers Ltd.

Prefix: Mr First Name: Mark Surname: Forbes

Address: Block B, Innovation Quarter Ballina,
Tone St, Ballina,
Co. Mayo, F26 WY4X

Qualifications/Experience: Chartered BE CEng MIEI

Date of Report: 15-Apr-2026

Phone: +353 96-56095 E-mail: info@mfagroup.ie

Indemnity Insurance Number: On Request

Signature: Mark Forbes

NOTE: To secure your work prior to forwarding to third parties please select **Print**, select Printer **"print to PDF"** and name and save document.

APPENDIX B
PHOTOGRAPHIC REPORT

No.	Photo	Note
1		Site Overview
2		Trial Hole
3		Trial Hole Spoil

4			"T1" Test Hole
5			"T2" Test Hole
6			"T3" Test Hole

7		"P1" Test Hole
8		"P2" Test Hole
8		"P3" Test Hole

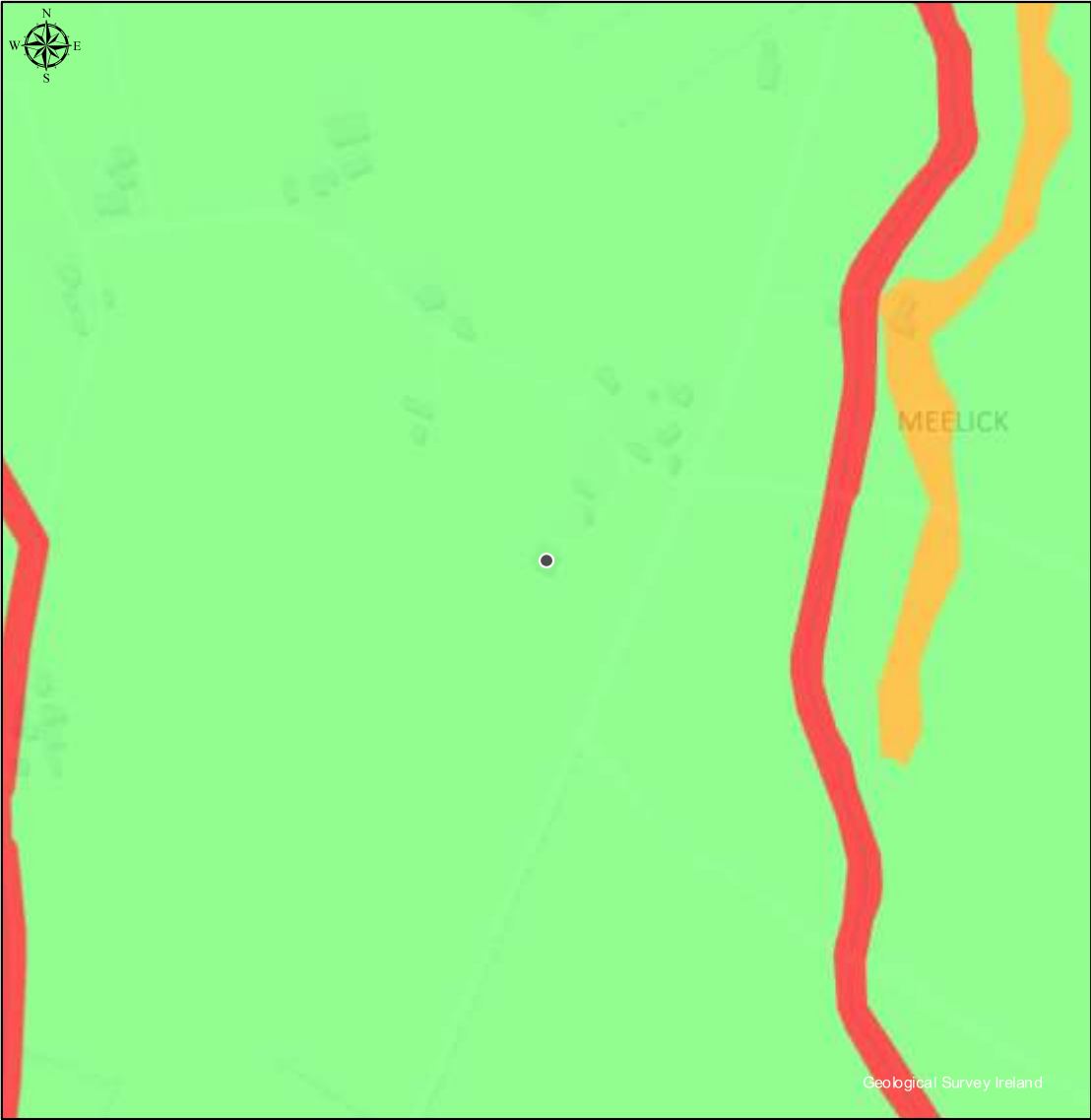
APPENDIX C
GSi MAPS

Meelick Groundwater Vulnerability

Legend

IE_GSI_Groundwater_V...

- Rock at or near Surface or Karst
- Extreme
- High
- Moderate
- Low
- Water



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Department of the Environment,
Climate and Communications



Meelick Groundwater Soils



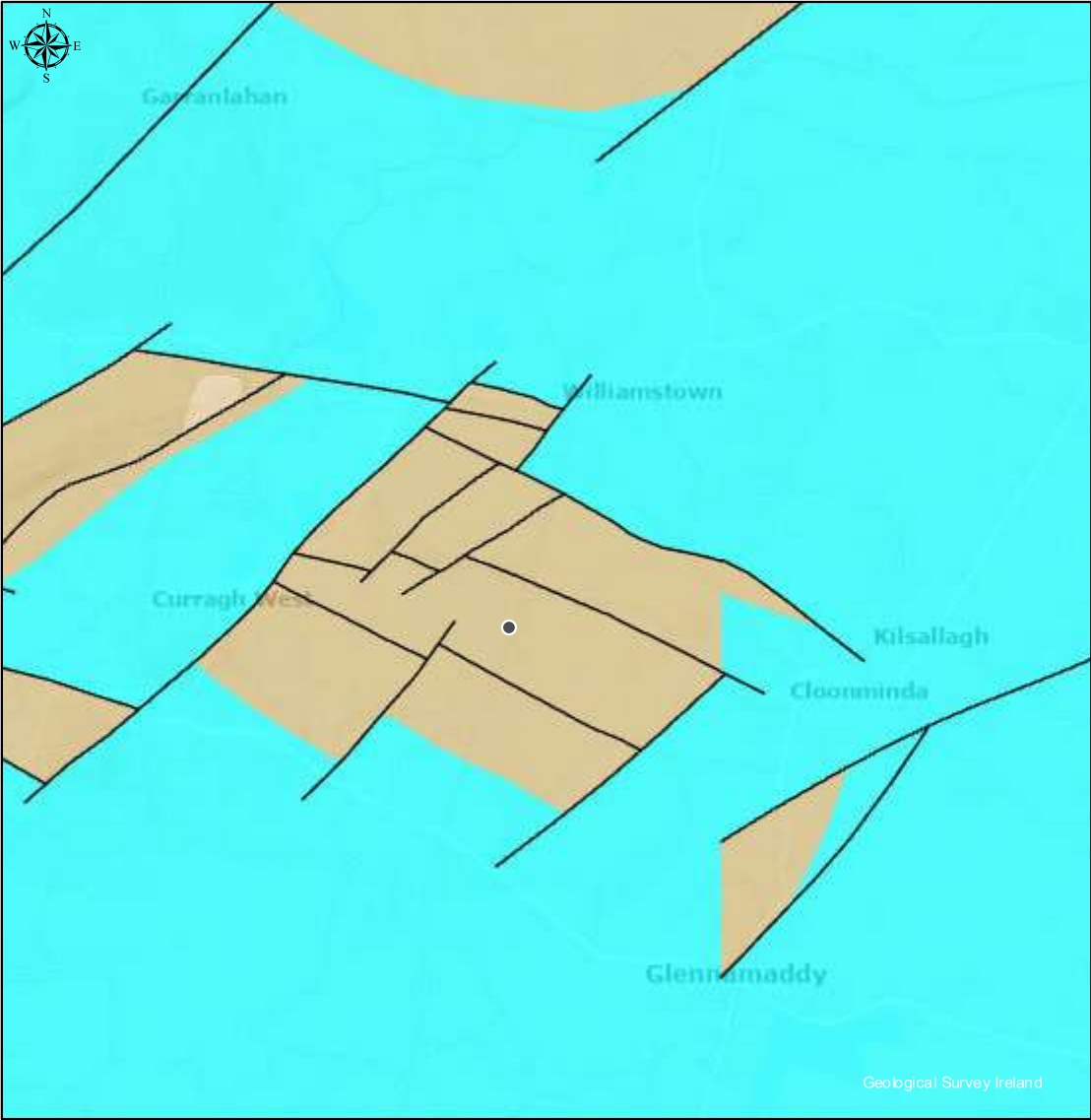
Legend

IE_GSI_TEAGASC_EPA...

- AminDW - Deep well drained mineral (Mainly acidic)
- AminPD - Mineral poorly drained (Mainly acidic)
- AminPDPT - Peaty poorly drained mineral (Mainly acidic)
- AminSW - Shallow well drained mineral (Mainly acidic)
- AminSP - Shallow poorly drained mineral (Mainly acidic)
- AminSPPT - Shallow peaty poorly drained mineral (Mainly acidic)
- AminSRPT - Shallow, rocky, peaty/non-peatymi... complexes (Mainly acidic)
- BminDW - Deep well drained mineral (Mainly basic)
- BminPD - Mineral poorly drained (Mainly basic)
- BminPDPT - Peaty poorly drained mineral (Mainly basic)
- BminSW - Shallow well drained mineral (Mainly basic)

- BminSP - Shallow poorly drained mineral (Mainly basic)
- BminSPPT - Shallow peaty poorly drained mineral (Mainly basic)
- BminSRPT - Shallow, rocky, peaty/non-peatymi... complexes (Mainly basic)
- BktPt - Blanket peat
- FenPt - Fen peat
- RsPt - Raised Peat
- Cut - Cutover/cutaway peat
- AlluvMIN - Alluvial (mineral)
- AlluvMRL - Alluvial (marl)
- Lac - Lacustrine type soils
- Scree - Scree
- AeoUND - Aeolian undifferentiated
- MarSands - Marine sand and gravel
- MarSed - Marine/estuarine sediments
- Made - Made ground
- Water - Water
- Unclass

Meelick Aquifer



Legend

IE_GSI_Sand_and_Gra...

- Regionally important gravel aquifer
- Locally important gravel aquifer
- IE_GSI_Aquifer_G...

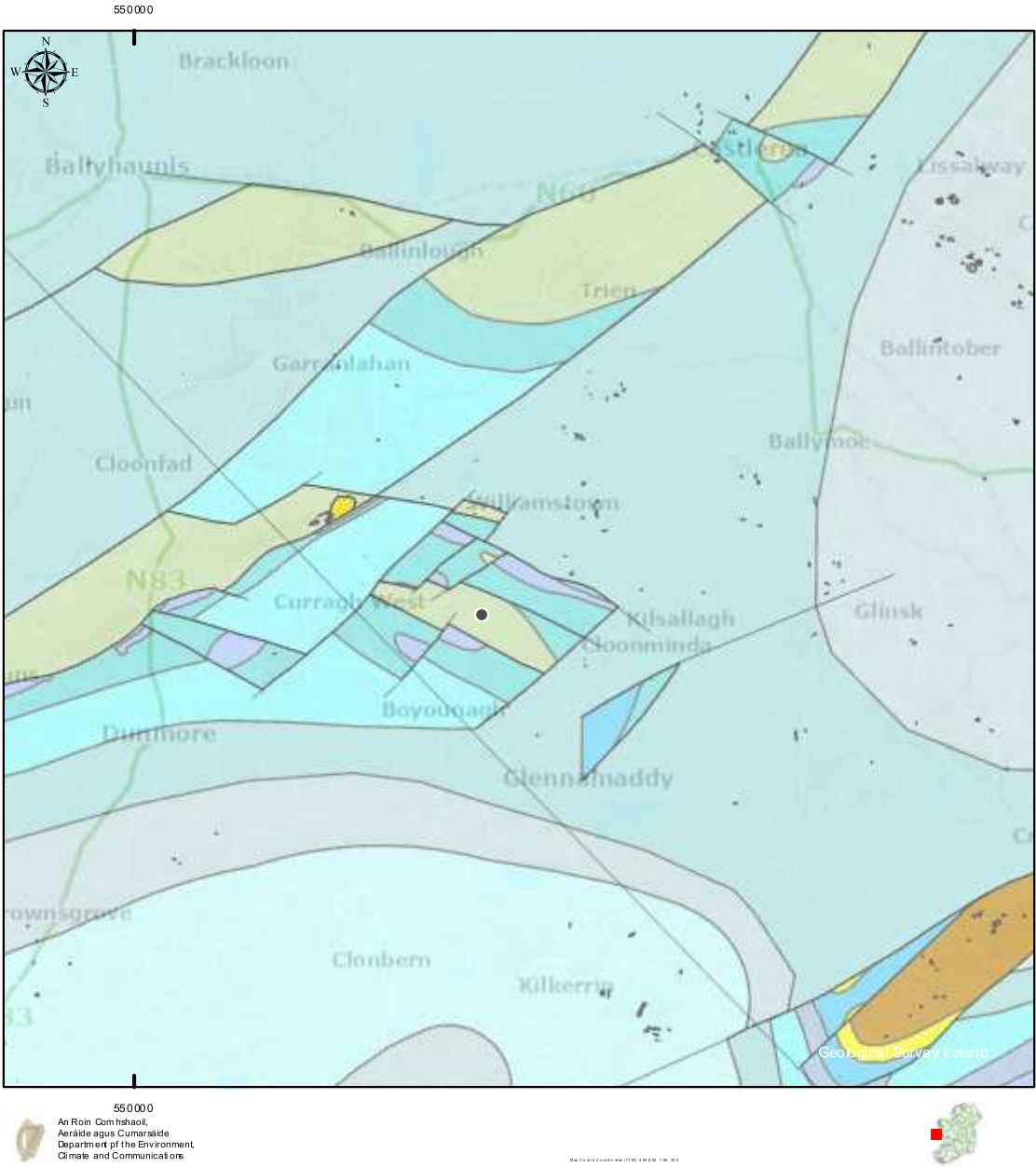
IE_GSI_Bedrock_Aquif...

- Rkc - Regionally Important Aquifer - Karstified (conduit)
- Rkd - Regionally Important Aquifer - Karstified (diffuse)
- Rk - Regionally Important Aquifer - Karstified
- Rf - Regionally Important Aquifer - Fissured bedrock
- Rf/Rk - Regionally Important Aquifer - Fissured bedrock/Regionally Important Aquifer - Karstified
- Lm - Locally Important Aquifer - Bedrock which is Generally Moderately Productive

- Lk - Locally Important Aquifer - Karstified
- 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
- Pu - Poor Aquifer - Bedrock which is Generally Unproductive
- Lake
- Unclassified

Meelick Bedrock



Legend

Bedrock Outcrops

IE_GSI_Geological_Lin...

Antidinal Axis

Antiformal axis

Aquifer Boundary

Area

Coal seam

Dyke

Fault

Ghost Line

Goniatite marine band (R1-R4)

Lithological boundary offshore

Metadolerite sheet, mainly sills

Paleogene/ Tertiary Dyke

Syndinal Axis

Synformal axis

Tectonic Slide, barbs on hanging-wall

Thin stratigraphical unit, diagrammatic

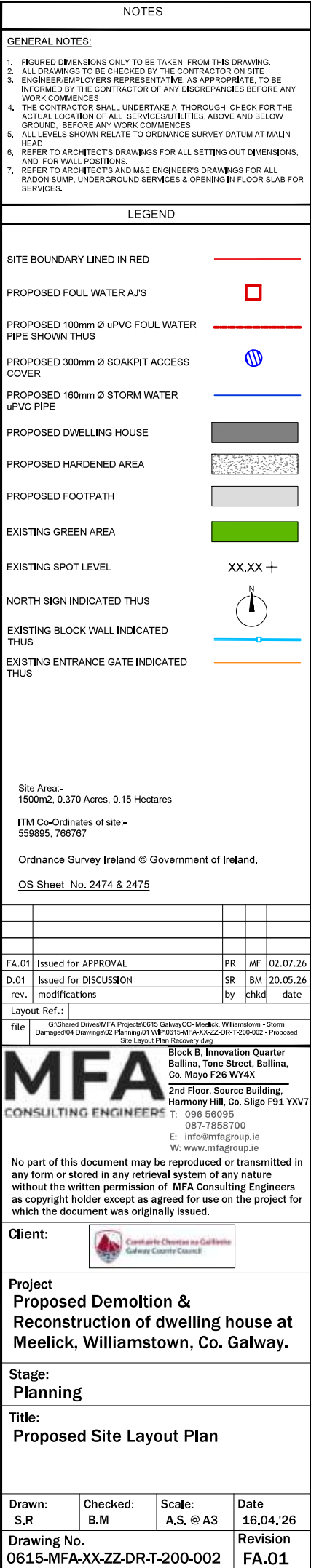
Thrust, barbs on hanging-wall side

Tuff band

Unconformity, dots on younger side

X-Section

APPENDIX D
SITE LAYOUT PLAN



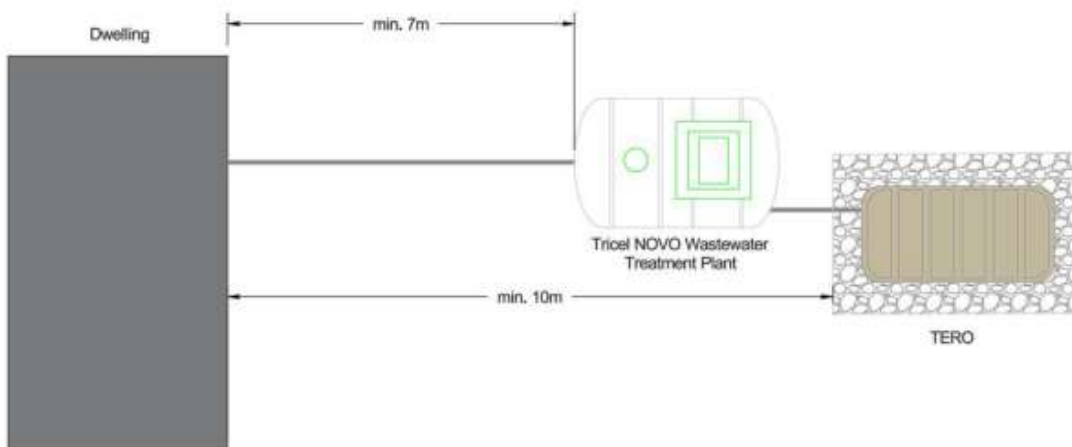
APPENDIX E
WASTEWATER TREATMENT SYSTEM DETAILS

Date	02/07/2026
Report No:	TSA_G_19474_2
Client Name	Galway
Site Location & Townland	County Council, Meelick, Williamstown, Galway

Thank you for choosing Tricel for your wastewater treatment requirements. This report contains the following information for your site and is based on a population of 4 and a subsurface/surface value of between 3-20.

Based on the information provided to us and using SR66 and the EPA Code of Practice: Wastewater Treatment and Disposal Systems Serving Single Houses (p.e. ≤ 10), the appropriate solution for treating wastewater on your site is a Tricel Novo Package Plant and Tricel Tero.

Typical layout of a Tricel Novo Package Plant and Tricel Tero:



Note:

In the above named site, a substitute wastewater treatment system may not be put in place of the following recommendation.

This recommendation only applies to the above named site based on the information supplied to Tricel.

A Site Characterisation Form should accompany this report. Tricel cannot be responsible for misinformation due to misleading information being received by us from clients.

Section 1: Information on the Novo Package Plant

- Manufacturers report and sizing of the Tricel Novo Package Plant.
- Drawings of the Novo Package Plant.
- Pump selection and technical data
- Certification of the selected Novo Package Plant.
- Brochure on the Novo Package Plant.
- Optional Novo maintenance agreement.

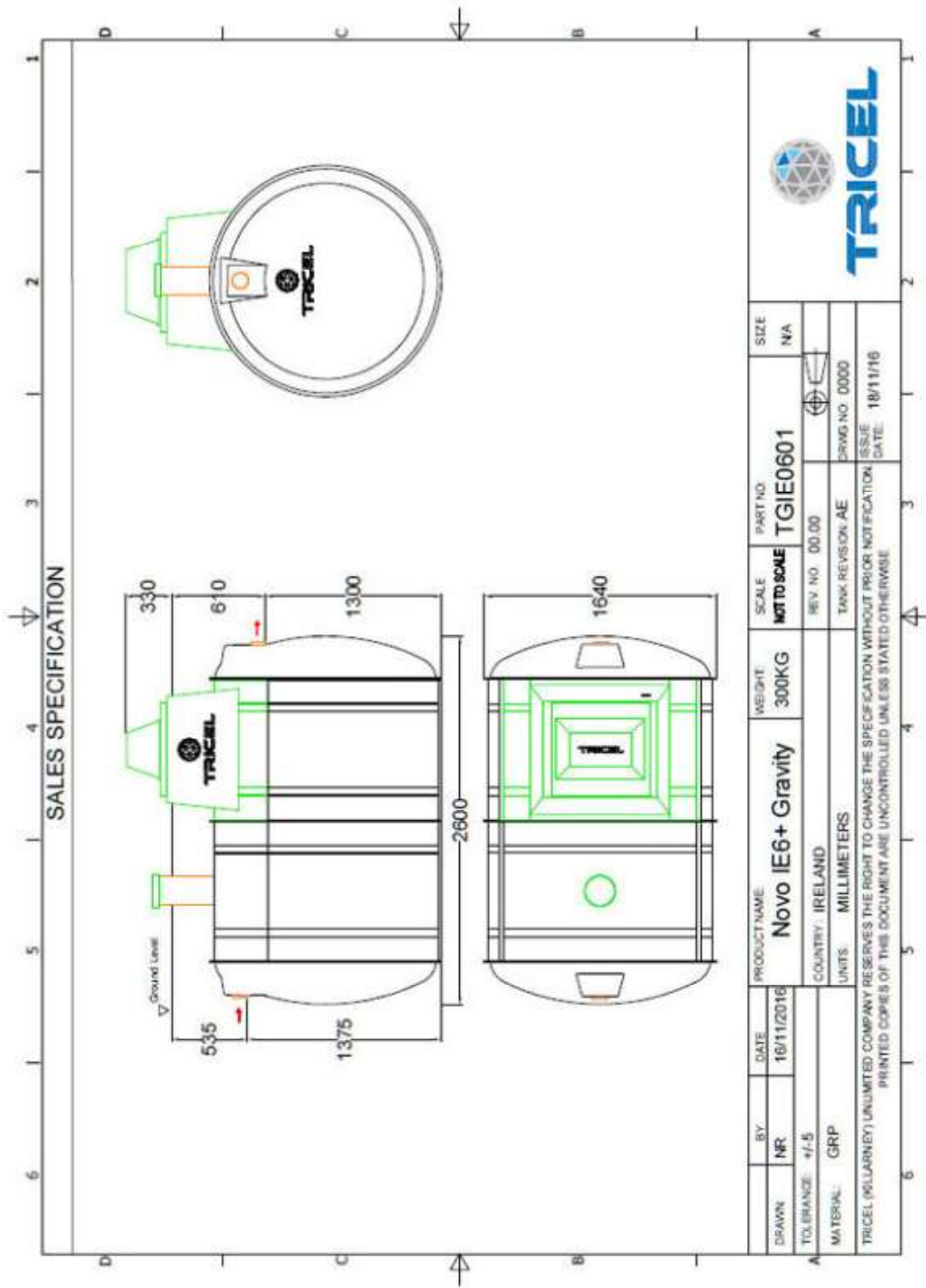
For your site, we recommend a Novo IRL6+ wastewater treatment plant which is designed to treat a maximum of 900 litres of wastewater per day. The Tricel Novo range of wastewater treatment plants is fully in conformance with EN12566-3 and complies with SR66.

The Novo IRL6+ has a capacity of 4000 litres, of which 2400 are in the primary chamber, this ensures a long desludging interval.

This solution contains a BEST ONE pump based on an the Length of Rising Main 18.64 metres and Difference in Height of Rising Main 0.514 metres. A 38mm compression is supplied for connection to a rising main of 38mm internal bore pipework. Details and pump specifications are contained in Section 1.



Section 1



Rev.M

SUBMERSIBLE SUMP PUMPS

BEST ONE

SPECIFICATION

50Hz

PUMP		
Liquid Handled	Type of liquid	Clear water (Clean water for MS version)
	Max temperature [°C]	50
	Max solids size [mm]	10 20 (for Vortex version)
Maximum immersion [m]		5
Construction	Impeller	Semi-open centrifugal type (BEST ONE) Vortex type (BEST ONE VOX)
	Shaft seal type	Oil lubricated mechanical seal (pump side) + lip seal (motor side)
	Bearing	Sealed ball bearing
Pipe Connection	Suction	Strainer
	Discharge nozzle [inch]	G1½": UNI ISO 228
Material	Pump casing	AISI 304
	Impeller	AISI 304
	Shaft seal	Mechanical seal: Ceramic/Carbon/NBR Lip seal: NBR
	Casing cover	AISI 304
	Shaft	AISI 303 + AISI 303 ceramic coated shaft sleeve
	Lubricating liquid	White mineral oil: Esso Marcol 152
Applicable standard of test		ISO 9906 – Annex A

MOTOR		
Type	Submersible dry type	
	Single Phase	Three Phase
No. of Poles	2	
Rotation speed [min ⁻¹]	≈2800	
Insulation Class	F	
Protection degree	IP 68	
Power rating [kW]	0.25	
	0.33	
Frequency [Hz]	50	
Voltage [V]	230 ±10%	400 ±10%
Capacitor	Built in	-
Over load protection	Built in	-
Casing material	AISI 304	
Switch	float	MA version (no maintenance required)
	magnetic	MS version (maintenance required)
Float/magnetic switch cable	material	H07RN-F
	size	3G1
	length [m]	5 (only for internal usage)
Power cable	material	H05RN-F
	size	3G0.75
Cable entry	Cable Gland	

200



EBARA PUMPS EUROPE S.p.A.

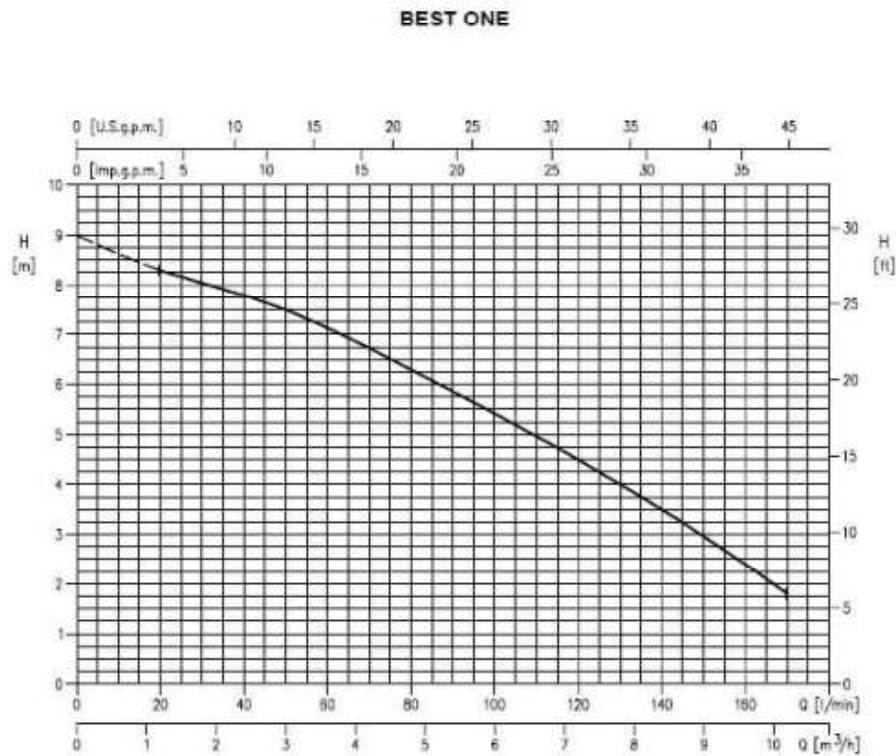
Rev.M

SUBMERSIBLE SUMP PUMPS

BEST ONE

PERFORMANCE CURVE

50Hz



Certificate in accordance with SR66 for EN12566-Part 3



Prüfinstitut für
Abwassertechnik
GmbH

TREATMENT PERFORMANCE RESULTS

Tricel (Killarney)
Ballyspillane Industrial Est., Killarney, Co. Kerry, Ireland

EN 12566-3
Results corresponding to EN 12566-3 and S.R. 66
PIA-SR66-1512-1062

Novo
Submerged fixed film

Nominal organic daily load	0.26 kg/d		
Nominal hydraulic daily load	0.90 m ³ /d		
Material	Glass reinforced plastic		
Watertightness	Pass		
Structural behaviour (Calculation)	Pass (also wet conditions)		
Durability	Pass		
Treatment efficiency (nominal sequences)			
	Efficiency	Effluent	
	COD	91.6 %	52 mg/l
	BOD ₅	95.9 %	11 mg/l
	NH ₄ -N	79.9 %	8 mg/l
	SS	95.3 %	16 mg/l
Number of desludging	Not more than once		
Electrical consumption	1.1 kWh/d		

Performance tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergenrather Weg 30
52074 Aachen, Germany

This document replaces neither the declaration
of performance nor the CE marking.



Notified Body
No.: 1739



Certified according to
ISO 9001:2008



ILAC-MEA



DAKKS
Deutsche
Akkreditierungsstelle
D-PL 17712-01-00



Elmar Lancé
July 2015

NOVO BROCHURE

Homeowners: Individual domestic installation



► The lightweight nature of the system makes for easy on-site delivery.



► No need for big excavators and large holes that disrupt and disturb your garden.



► Very low visual impact from fully installed units.

Larger projects: Commercial installations up to 50PE



► These units are suitable for installation at housing estates, camping sites, hotels etc. and have low maintenance and running costs.



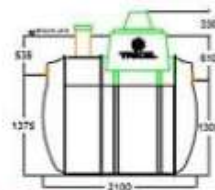
► Each WWTP unit is constructed of lightweight SMC and is easy to maneuver which simplifies the installation process.



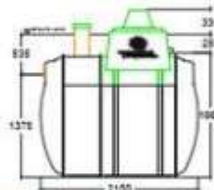
► Example of a fully installed 50PE Novo wastewater treatment unit in a 5-star hotel.

Technical characteristics/ Plant dimensions

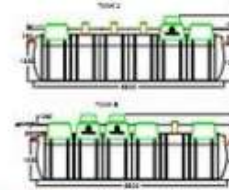
Form	Design Population	No. of people	Length	Width	Height	Wastewater inlet/outlet diameter	Weight empty	Inlet Invert to base	Outlet Invert to base	Inlet Invert to ground level	Air blower rating
			m			mm	kg	m			watts
IE6		1-5	2.1	1.64	2.24	110	270	1.375	1.1	0.535	60
IE6+		3-6	2.6	1.64	2.24	110	500	1.375	1.1	0.535	60
IE8		2-8	2.6	1.64	2.24	110	300	1.375	1.1	0.535	80
IE10		3-10	3.1	1.64	2.24	110	370	1.375	1.1	0.535	80
IE11		4-12	3.6	1.64	2.27	110	400	1.375	1.1	0.535	100
IE15		6-18	4.6	1.64	2.27	110	500	1.375	1.1	0.535	200
IE24		8-24	6.6	1.64	2.27	150	700	1.35	1.1	0.56	200
IE30	Tank A	10-30	2.6	1.64	1.99	150	300	1.35	1.1	0.46	
	Tank B		5.6	1.64	2.27	150	600	1.35	1.1	0.56	200 x 80
IE36	Tank A	12-36	3.6	1.64	1.99	150	400	1.35	1.1	0.46	
	Tank B		6.6	1.64	2.27	150	700	1.35	1.1	0.56	200 x 80
IE42	Tank A	14-42	5.6	1.64	2.27	150	600	1.35	1.1	0.46	
	Tank B		5.6	1.64	2.27	150	600	1.35	1.1	0.56	200 x 2
IE50	Tank A	18-50	6.6	1.64	2.27	150	700	1.35	1.1	0.46	
	Tank B		6.6	1.64	2.27	150	700	1.35	1.1	0.56	200 x 120 x 80



► **IE6 gravity outlet**
Up to 6PE domestic gravity flow outlet.



► **IE6 pumped outlet**
1-6 domestic pumped unit. Suitable for pumping to a raised discharge area (over).



► **Gravity IE50 outlet**
Suitable for commercial installation, caters for up to 50 people.

Tricel Novo riser options for deep installation

Tricel offer 3 different manhole riser heights to suit different Invert/Inlet levels. Manhole risers allow for the positioning of the treatment plants at the depth which is optimum to each individual installation. Wastewater is gravity fed from the home to your treatment plant. The inlet pipe's position from the premises determines the excavation depth for the WWTP plant. Tricel offer a choice of manhole risers 250mm/500mm/750mm to help with installation where site conditions require a flexible solution.

**Tricel Novo: Wastewater Treatment System
Service Agreement**

Establishing a regime of yearly inspections and maintenance is advised to ensure that your Tricel Novo continues to perform to the same high standards throughout its lifetime. The service agreement covers travel, the service and the labour cost of servicing only. Other labour costs are excluded, as are all replacement parts.

Tricel (Killarney) Unlimited Company, Ballyspillane Industrial Estate, Killarney, Co. Kerry, V93 X253, Ireland ("the Company") enter this Tricel Novo service agreement with the Customer named below:

Customer Details:			
Name:			
Address:		Address of Site: (If other)	
Telephone No.:			
Date of Tricel Novo Order:			
Work Order No.:			
Date of Delivery of Tricel Novo:			
Date of System Commissioning:			
Service Agreement Fee Paid:			
Date of Service Agreement Commencement:			
Unit Serial No.:			

During routine servicing, the service technician will perform a series of checks and procedures:

Checks:

- The air-diffuser is monitored to check for sufficient dispersion of air.
- The sludge return system is functioning correctly.
- The covers and locks are in place and in good condition.
- General appearance and condition of the treatment system is good.

Procedures:

- The blower is tested.
- The blower filter is replaced.
- The system alarm is tested.
- The pump and float-switch are tested (if applicable).
- The vents are cleared of any blockages.
- The sludge level in the primary chamber is measured.

Notes:

- Full inspection labour is covered (including any immediate minor system adjustment required). This service agreement does not cover the cost of any labour or materials that may arise as a result of this inspection.
- Components that require replacing will incur additional charges.
- All service agreements exclude de-sludging.

Tricel (Killarney) Unlimited Company trading as Tricel.

March 2017

Section 2: Information on Tertiary Treatment and Disposal route

The proposed solution to use on site is a Tero module.

This system will provide tertiary treatment a total of 1 modules are required to ensure the loading rate of the coconut coir filter per day is not exceeded.

The tertiary treated liquids is disposed into the ground through a gravel distribution layer required underneath the Tero module. The gravel distribution layer must be 300mm thick and should be 15.00m² based on a population of 4 and a Subsurface/surface Value of 3-20.

The location and construction of the Tertiary infiltration area is the responsibility of the site engineer. A full site layout drawing should accompany this report.

The EPA CoP 2021 outlines the design, siting and construction requirements for tertiary polishing filters. The tables below outline some of the key factors to take into consideration when designing and locating a tertiary polishing filter.

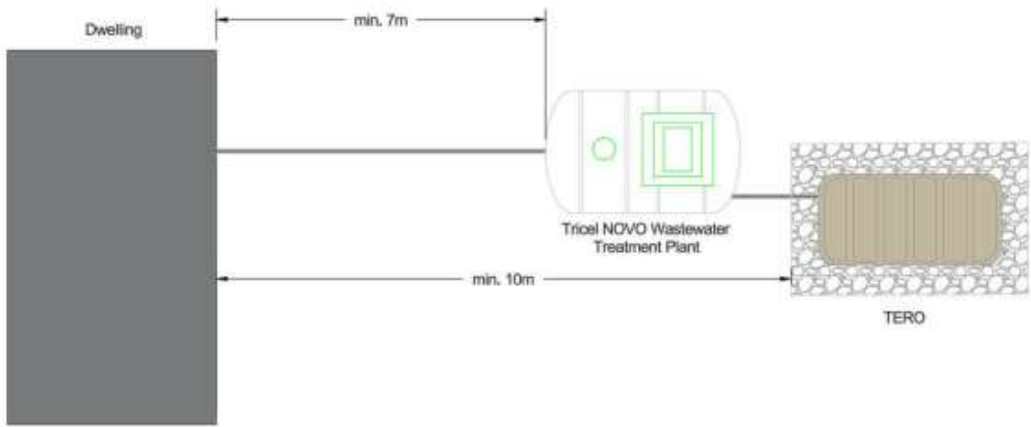
Table 6.2: Minimum separation distances from the entire DWWTS

Features			DWWTS – periphery of tank/plant and infiltration/treatment area (m)
Public/group water supply abstraction points/wells			60
Down-gradient domestic well	3 ≤ PV ≤ 10 (usually SAND- or GRAVEL-dominated material)	Depth of soil/subsoil > 2.0 m between invert level and bedrock, and water table 1.2–2.0 m	60
		Depth of soil/subsoil 2.0–8.0 m between invert level and bedrock, and water table > 2.0 m	40
		Depth of soil/subsoil > 8.0 m between invert level and bedrock, and water table > 2.0 m	30
	10 < PV ≤ 30 (usually SILT- or SAND- or silty GRAVEL-dominated material)	Depth of soil/subsoil 1.2–8.0 m between invert level and bedrock	45
		Depth of soil/subsoil > 8.0 m between invert level and bedrock	30
	30 < PV ≤ 120 (usually SILT/CLAY- or CLAY-dominated material)	Depth of soil/subsoil 1.2–3.0 m between invert level and bedrock	40
		Depth of soil/subsoil ≥ 3.0 m between invert level and bedrock	30
Alongside domestic well			25
Up-gradient domestic well			15
Karst feature			15
Lake or foreshore			50
Watercourse/stream			10
Open drain or drainage ditch			10
Adjacent tank/plant and percolation area, polishing filter or infiltration area			10
On-site dwelling house			7 (tank/plant)
			10 (free water surface constructed wetland)
			10 (infiltration/treatment area)
Neighbouring dwelling house			7 (tank/plant)
			25 (free water surface constructed wetland)
			10 (infiltration/treatment area)
Surface water soakaway ^a			5
Road			4
Slope breakouts			4
Trees ^b			3
Site boundary			3
Heritage features, NBHA/SAC/SPA ^c			See note
PV, percolation value. ^a The soakaway for surface water drainage should be located down-gradient of the infiltration/treatment area; it should also be ensured that this distance is maintained from neighbouring storm water disposal areas or soakaways. ^b Tree roots may lead to PFPs developing. The canopy spread indicates potential root coverage. ^c The distances required depend on the importance of the feature. Therefore, advice should be sought from the local authority and/or from the the Department of Housing, Local Government and Heritage, specifically the National Monuments Service and the National Parks and Wildlife Service.			

Table 6.1 EPA CoP 2021: Minimum separation distances

Please see attached the accompanying documents in Section 2 for the Tricel Tero

- Separation Distances
- Tero Drawing
- Tero Technical Specification
- Technical information on the Tero



The Tricel Tero modules are filled with coconut coir. The wastewater is distributed over the top of the coir filter using a specially designed pipe network. Through a combination of biological, chemical and physical processes the coir treats the wastewater as it filters through. At the outlet of the Tero modules the tertiary treated wastewater is discharged into the in situ subsoil through a gravel distribution area.

TERO BROCHURE

TERO module

The Tricel TERO tertiary wastewater system further purifies the treated effluent from a packaged wastewater treatment plant resulting in a reduced area and depth of discharge bed.

Stage One:

TERO receives secondary treated effluent from a wastewater treatment plant. The TERO is designed to work seamlessly with the Tricel NOVO but can also be used with third-party products, providing that a pumped discharge with a dose limit is utilised.

Stage Two:

The pre-treated effluent is dispersed using an easily serviceable distribution network which ensures the effluent is distributed evenly and uniformly onto natural filter media. The effluent filters through the media and is treated by a combination of biological, chemical and physical processes. The treated water is transported to the soil at the base of the tank.



Diagram Index:

1. Tricel NOVO wastewater treatment plant
2. TERO Module
3. Inlet Pipe
4. Distribution Pipework
5. Coconut Fibre
6. Outlets
7. Gravel Bed

The environmental advantages of TERO

- Improved BOD treatment efficacy. Test results show less than 5000 cfu/100mL reducing soil depth requirements to 500mm.
- TERO is an environmentally friendly system that utilises natural, long-life renewable media. The remarkable filtration properties of coconut fibre requires no chemical additives in achieving exceptional results.
- The closed system design of TERO greatly reduces odour whilst ensuring high treatment efficiency of the wastewater.

Advantages for you

- Compact system - one module meets requirements for SFE.
- The modular design of TERO makes it ideal for retrofit upgrades, extensions etc., and can be used with many existing treatment systems.
- The shallow profile of TERO makes it easy to incorporate into landscape design.
- Simple maintenance. No desludging required.
- No electrical components or power consumption used in the TERO system.

Advantages for installation

- Easy installation - Flat base for easy installation, one start connection from wastewater plant. Reduced discharge depth and area, thus reducing contractor expense and costs.
- Plug and play system - assembled module with single input connection.

The TERO system has undergone a rigorous performance testing regime to achieve the highest results required. The tables below show the sites and the wastewater treatment capability of a TERO. If you have any specific requirements, please contact the Tricel sales team who will be able to assist you with your enquiry.

Tertiary Treatment Performance	
Site/Location	Performance
Minimum Organic Design Load	0.02 kg BOD/d
Minimum Hydraulic Daily Design Load	0.16 m³/d
Q10	3 m³/d
BOD5	4 m³/d
SS	0.3 m³/d
Peak	0.3 m³/d
Electrical Power Consumption	0.2 kWh/d
Number of desludging	0

* Determined at temperature of 12°C

TERO module dimensions	
Length	1.600m
Height	1.070m
Width	1.000m
Weight (over 1000 modules)	100kg

SEWAGE TREATMENT SIMPLIFIED

Sewage Treatment: Combination of physical and biological processes which break down the organic and inorganic sewage content which cause pollution to receiving waters.

Receiving Waters: All groundwaters and watercourses such as streams and rivers.

Population Equivalent (PE): A measure of the number of people that treatment plant serves.

Media: Coconut fibre.

Biodegradable: The solids that settle to the bottom of the tank.

BOD: Biological Oxygen Demand measured in milligrams per litre (mg/l) is a relative measure of how polluting the sewage is.

SS: Suspended Solids measured in milligrams per litre (mg/l) includes all suspended matter both organic and inorganic.

E.Coli/bacteria: commonly used as an indicator microorganism for faecal pollution, and the sanitary quality of foods and water. Measured in 1000s (1000s).

Pathogenic Bacteria: Pathogenic bacteria such as Salmonella and bacteria which cause disease in humans and animals.

The Tero modules are a tertiary treatment filter. They can be located above or below ground depending on the existing bedrock or subsoil. According to the EPA Code 2021 the tertiary treated effluent can be discharge to ground through a gravel distribution area. As outlined below in table 10.1 the area required per person of this distribution bed is dependent on the Subsurface value of the receiving subsoil. It is compulsory that the percolation test is carried out at the infiltration level which is located at the base of the proposed distribution layer. This distribution bed should comprise of a 300mm layer of 12 -32mm gravel

Table 10.1: Infiltration/treatment area and trench length design for tertiary treatment, per PE

Percolation values (PVs)	Pumped or underlying gravity discharge (Options 1 and 2)	Gravity discharge into 500 mm wide trenches (Option 3)	Low-pressure pipe distribution into 300 mm wide trenches (Option 4)	Drip dispersal system (Option 5)	Tertiary infiltration area (Option 6)
	Area required per person (m ²)	Trench length required per person (m)	Trench length required per person (m)	Area required per person (m ²)	Area required per person (m ²)
$3 \leq PV \leq 20$	≥ 7.5	≥ 6	≥ 6	≥ 5	≥ 3.75
$21 < PV \leq 40$	≥ 15	≥ 12	≥ 12	≥ 14	≥ 7.5
$41 < PV \leq 50$	≥ 30	≥ 17	≥ 17	≥ 16	≥ 15
$51 < PV \leq 75$	≥ 50	≥ 19	≥ 19	≥ 22	≥ 25
$76 < PV \leq 90$	–	–	≥ 28	≥ 34	–
$91 < PV \leq 120$	–	–	–	≥ 54	–

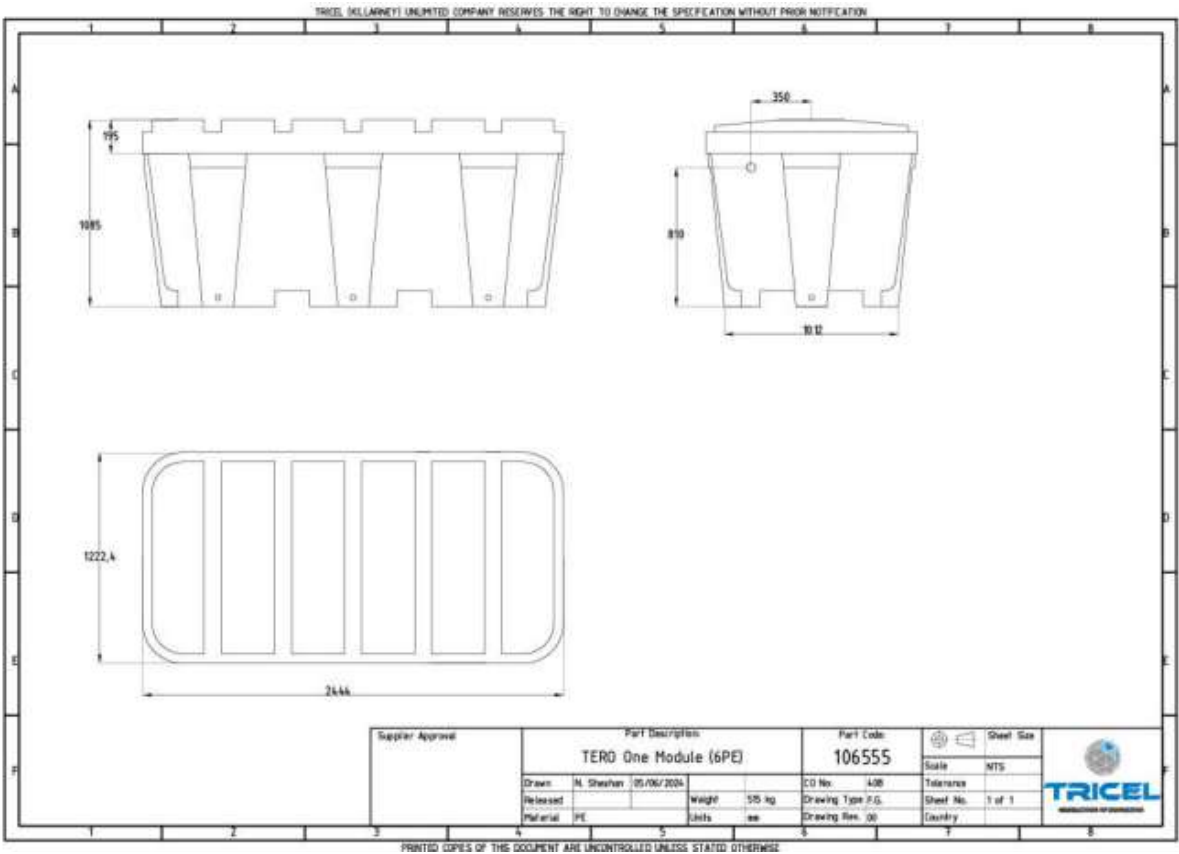
Table 10.1 from EPA CoP 2021 - Loading rates for infiltration/treatment area

Terms and conditions:

Tricel cannot accept responsibility for incorrect site details or calculations as these are based on user inputs which are outside of Tricel control.

Full terms of website use are available at www.tricelsiteassessor.ie/TermsOfWebsiteUse

*****Domestic WwTP catering for over 10 Population Equivalent that are discharging to TERO Tertiary Treatment modules may require a pump station*****





Contact us

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