Waste Water
Maintenance Limited

SITE CHARACTERISATION REPORT

Ref: **Keith Justice**
Glenaraneen
Brittas
Co. Dublin

DATE: **16 February 2021**

Site Assessment Summary:

- Groundwater: Not encountered at 2.1m
- Bedrock: Not encountered at 2.1m
- T Value: 18
- P Value: n/a
- Well: Wells >30m

The house is currently served by an old septic tank and soak – pit. Recently the soak-pit has started to flood discharging raw effluent over ground in the lower garden.

As the existing septic tank system has failed it is proposed to install a new on-site sewage system to serve the house.

Based on the site assessment with consideration to the proximity of the Well, the available area and the high loading of 11 people a tertiary on-site system is recommended to include, sewage treatment plant and sand filter overlying soil / stone polishing filters.

This will provide greater protection and separation distances from the Well as well as reducing the required footprint for the necessary percolation which will be beneficial due to the mature vegetation and roots.

Based on the site assessment I have made the following recommendations.

- Install new wastewater treatment system.
- Install a 30m square sand filter
- 80m sq soil filter under the sand filter

Report & Recommendations prepared by: Waste Water Maintenance Ltd.

SITE CHARACTERISATION FORM
COMPLETING THE FORM

Note:	This form requires the latest version of Adobe Acrobat Reader and on PC's Windows 7 or later. Windows XP produces errors in calculations

Step 1:

Goto Menu Item **File, Save As** and save the file under a reference relating to the client or the planning application reference if available.

Clear Form Use the **Clear Form** button to clear all information fields.

Notes:

All calculations in this form are automatic.

Where possible information is presented in the form of drop down selection lists to eliminate potential errors.

Variable elements are recorded by tick boxes. In all cases only one tick box should be activated.

All time record fields must be entered in twenty four hour format as follows: HH:MM

All date formats are DD-MM-YYYY.

All other data fields are in text entry format.

This form can be printed out fully populated for submission with related documents and for your files. It can also be submitted by email.

Section 3.2 In this section use an underline _____ across all six columns to indicate the depth at which changes in classification / characteristics occur.

Section 3.4 Lists supporting documentation required.

Section 4 Select the treatment systems suitable for this site and the discharge route.

Section 5 Indicate the system type that it is proposed to install.

Section 6 Provide details, as required, on the proposed treatment system.

APPENDIX A: SITE CHARACTERISATION FORM

File Reference:

1.0 GENERAL DETAILS (From planning application)

Prefix: Mr First Name: Keith Surname: Justice

Address:

Glenaraneen, Brittas, Co. Dublin

Site Location and Townland:

Same - proposed new on-site sewage system to replace old septic tank and failed soak-pit

Number of Bedrooms: 7 Maximum Number of Residents: 9

Comments on population equivalent

4 Double bedrooms & 3 Single.
Currently 11 people living in the house - Minimum 12pe sewage treatment plant recommended.

Proposed Water Supply:

Mains ☐ Private Well/Borehole ☑ Existing well on-site Group Well/Borehole ☐

2.0 GENERAL DETAILS (From planning application)

Soil Type, (Specify Type): Brown Podzolics

Subsoil, (Specify Type):

Bedrock Type: Silurian Metasediments & volcanics

Aquifer Category: Regionally Important | Locally Important _____ Poor Pl

Vulnerability: Extreme ☑ High ☐ Moderate ☐ Low ☐

Groundwater Body: Kilcullen Status _____

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

Source Protection Area: ZOC ☐ SI ☐ SO ☐ Groundwater Protection Response: R2[1]

Presence of Significant Sites (Archaeological, Natural & Historical): None within 250m

Past experience in the area: Mixed area with good & bad soakage

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).

Ground water & shallow rock are targets
The well is a target

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: Hilly

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

Slope Comment: Steep to flat in test area

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

Houses:

Existing house on site >30m up steep gradient

Existing Land Use:

House & mature gardens

Vegetation Indicators:

No soakage indicators noted

Groundwater Flow Direction: West / South to North

Ground Condition:

Soft underfoot

Site Boundaries:

Wire fencing, trees & bushes

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Roads:

Local road passes the front entrance

Outcrops (Bedrock And/Or Subsoil):

None visible

Surface Water Ponding:

None on test days - but septic tank heavily ponding - failed soak-pit

Lakes:

Brittas ponds > 250m

Beaches/Shellfish Areas:

None within 250m

Wetlands:

None within 250m

Karst Features:

None

Watercourses/Streams:*

None within 100m

*Note and record water level

3.1 Visual Assessment (contd.)

Drainage Ditches:*

None around the site

Springs:*

Well located N > 30m up gradient

Wells:*

The well is a target but should be protected by distance and gradient
Well located up steep gradient >30m

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 house is served by a very old septic tank (>40 years old) which drains into a soak-pit that has failed resulting in raw sewage & effluent ponding in the immediate area presenting a serious health & safety risk,

It is proposed to decommission the septic tank and soak-pit and install a new on-site sewage system designed based on the findings of the completed site assessment.

***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): 2.1

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): No rock or water encountered at 2.1m

Date and time of excavation: 10-Feb-2021

Date and time of examination: 16-Feb-2021

Depth of Surface and Subsurface Percolation Tests	Soil/Subsoil Texture & Classification**	Plasticity and dilatancy***	Soil Structure	Density/ Compactness	Colour****	Preferential flowpaths
0.1 m	slightly gravelly slightly sandy (gritty) SILT/CLAY 0-0.4m	Threads 6/3/3 Ribbons 85/70mm Dilates	Crumb	Firm / Soft	Dark Brown	Roots
0.2 m						
0.3 m						
0.4 m						
0.5 m	sandy SILT/CLAY) REAM) 0.4-0.5m	Threads 4/3/1 Ribbons 80/60mm Dilates	Blocky	Firm	Orange / Brown	Random
0.6 m						
0.7 m						
0.8 m						
0.9 m						
1.0 m						
1.1 m	sandy gravelly SILT/CLAY with cobbles & occasional boulders 0.5-2.1m	Threads 7/4/3 Ribbons 90/60mm Dilates	Blocky	Firm / Soft	Light Brown	Random
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	END OF PIT AT 2.1M					
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:

No seepage or mottling noted in the pit walls.
Groundwater is not a target

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)	600	600	600
Depth from ground surface to base of hole (mm) (B)	1,000	1,000	1,000
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

		1	2	3
Pre-soak start	Date	15-Feb-2021	15-Feb-2021	15-Feb-2021
	Time	08:45	08:45	08:45
2nd pre-soak start	Date	15-Feb-2021	15-Feb-2021	15-Feb-2021
	Time	14:00	14:00	14:00

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	16-02-2021	16-02-2021	16-02-2021
Time filled to 400 mm	09:14	09:15	09:17
Time water level at 300 mm	09:50	10:02	10:07
Time (min.) to drop 100 mm (T_{100})	36.00	47.00	50.00
Average T_{100}			44.33

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	09:50	10:47	57.00	10:02	11:05	63.00	10:07	11:07	60.00
2	10:47	11:58	71.00	11:05	12:15	70.00	11:07	12:22	75.00
3	11:58	13:11	73.00	12:15	13:32	77.00	12:22	13:50	88.00
Average Δt Value			67.00			70.00			74.33
	Average Δt/4 = [Hole No.1]		16.75 (t_1)	Average Δt/4 = [Hole No.2]		17.50 (t_2)	Average Δt/4 = [Hole No.3]		18.58 (t_3)

Result of Test: Subsurface Percolation Value = 17.61 (min/25 mm)

Comments:

The subsoil in the tested area is suitable for the treatment of effluent.

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	$K_{ts} = T_f / T_m$	T – Value = 4.45 / K_{ts}
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	$K_{ts} = T_f / T_m$	T – Value = 4.45 / K_{ts}
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

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	$K_{ts} = T_f / T_m$	T – Value = 4.45 / K_{ts}
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

Result of Test: Subsurface Percolation Value =

0.00 (min/25 mm)

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)			
Depth of hole (mm)	0	0	0
Dimensions of hole [length x breadth (mm)]	x	x	x

Step 2: Pre-Soaking Test Holes

Pre-soak start	Date			
	Time			
2nd pre-soak start	Date			
	Time			

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			
Time filled to 400 mm			
Time water level at 300 mm			
Time to drop 100 mm (T_{100})	0.00	0.00	0.00
Average T_{100}			0.00

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			0.00			0.00			0.00
2			0.00			0.00			0.00
3			0.00			0.00			0.00
Average ΔT Value			0.00			0.00			0.00

Average ΔT/4 = [Hole No.1] 0.00 (T_1)

Average ΔT/4 = [Hole No.2] 0.00 (T_2)

Average ΔT/4 = [Hole No.3] 0.00 (T_3)

Result of Test: Surface Percolation Value = 0.00 (min/25 mm)

Comments:

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_2)		0.00

Comments:

3.4 The following associated Maps, Drawings and Photographs should be appended to this site characterisation form.

1. Discovery Series 1:50,000 Map indicating overall drainage, groundwater flow direction and housing density in the area.
2. Supporting maps for vulnerability, aquifer classification, soil, subsoil, bedrock.
3. North point should always be included.
4. (a) Scaled sketch of site showing measurements to Trial Hole location and
   (b) Percolation Test Hole locations,
   (c) wells and
   (d) direction of groundwater flow (if known),
   (e) proposed house (incl. distances from boundaries)
   (f) adjacent houses,
   (g) watercourses,
   (h) significant sites
   (i) and other relevant features.
5. Site specific cross sectional drawing of the site and the proposed layout[1] should be submitted.
6. Photographs of the trial hole, test holes and site including landmarks (date and time referenced).
7. Pumped design must be designed by a suitably qualified person.

[1] The calculated percolation area or polishing filter area should be set out accurately on the site layout drawing in accordance with the code of practice's requirements.

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:

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)

Percolation test result: Surface: Sub-surface:

Not Suitable for Development **Suitable for Development**

Identify all suitable options		**Discharge Route**[1]
1. Septic tank system (septic tank and percolation area) **(Chapter 7)**	No	Proposed to use a tertiary waste water system on this site due to the limited available space, contours of the site and mature vegetation. Proposed sewage treatment plant with sand & stone polishing filters with final discharge to ground water.
2. Secondary Treatment System **(Chapters 8 and 9)** and soil polishing filter **(Section 10.1)**	Yes	
3. Tertiary Treatment System and Infiltration / treatment area **(Section 10.2)**	Yes	

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) 0.90

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

Based on the site assessment, number of occupants, the site layout and available space it is proposed to install a tertiary waste water system to include a sewage treatment plant, sand & stone polishing filters with a final discharge to ground water subject to approval by the County Council.

The system must be installed in accordance with the EPA CoP 2021.

Only foul and grey water to discharge to the sewage system.
Storm water must not be allowed into the sewage system.

[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	30		
Soil	80		
Constructed Wetland			
Other			

Packaged Secondary Treatment Systems receiving raw wastewater (Chapter 9)

Type: Tricel Treatment Plant

Capacity PE: 12

Sizing of Primary Compartment: ____ m^3

Polishing Filter*: (Section 10.1)

Surface Area (m^2)*

Option 1 - Direct Discharge
Surface area (m^2)

Option 2 - Pumped Discharge
Surface area (m^2)

Option 3 - Gravity Discharge
Trench length (m)

Option 4 - Low Pressure
Pipe Distribution
Trench length (m)

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
Site specific - contours of the site, mature vegetation and limited available space with a high loading of 11 people using the system	Tricel STP En & SR66 Certified BOD 95.9 SS 95.3 NH4-N 74.9	Tertiary system with final discharge to ground water

DISCHARGE ROUTE:

Groundwater	✔	Hydraulic Loading Rate * ($l/m^2.d$)	1,650.00	Surface area (m^2)	
Surface Water **		Discharge Rate (m^3/hr)	1.15		

* 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 must be supervised by suitably qualified person with a Completion Report prepared to include photographic evidence on completion of works.

On-going Maintenance

The system must be desludged annual or in accordance with the manufacturers instructions and serviced at least once every year by a suitably qualified person.

7.0 SITE ASSESSOR DETAILS

Company: Waste Water Maintenance Limited

Prefix: Mr First Name: Aidan Surname: Comerford

Address: 149 Woodfield, Scholarstown Road, Rathfarnham, Dublin 16

Qualifications/Experience: EPA SIte Assessor, Dip. Environmental Impact & Strategic Impact Assessment

Date of Report: 16-Feb-2021

Phone: E-mail info@wastewater.ie

Indemnity Insurance Number: ARB PI/D/1256/20/1

Signature: