APPLICANT: MR. GARY McKEON

EXISTING DEVELOPMENT AT GLASSAMUCKY,
BOHERNABREENA, DUBLIN 24

WASTEWATER TREATMENT SYSTEM REPORT

PATRICK JOYCE ASSOCIATES

CONSULTING ENGINEERS

2 PROSPECT GROVE

STOCKING LANE,

RATHFARNHAM,

DUBLIN 16.

MAY 2022

PATRICK JOYCE ASSOCIATES
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Dublin 16

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PATRICK C. JOYCE BE, MBA, C.Eng., MIEI

APPLICANT: MR. GARY McKEON

EXISTING DEVELOPMENT AT GLASSAMUCKY,
BOHERNABREENA, DUBLIN 24

WASTEWATER TREATMENT SYSTEM REPORT

Introduction:

The relevant development, relating to wastewater treatment, is the retention of existing building (A1) with new direct link to the existing family dwelling-house at Glassamucky, Bohernabreena, Dublin 24.

The existing dwelling-house is a detached bungalow with a converted attic area. The dwelling-house appears to have been constructed circa 40 years ago and contains three bedrooms. The building for which retention is sought was originally a detached garage and it is proposed to construct a new connecting lobby between the building and the dwelling-house to provide extra living accommodation.

Site Inspections:

I have carried out a visual inspection of the dwelling-house and of the existing wastewater treatment arrangements.

The existing wastewater arrangement consists of 2 No. septic tanks which are marked on Drawing No. EX-22-03: Existing Drainage Plan. I am instructed by the applicant there is an existing percolation area located where shown on the Drawing. The percolation area was constructed by the previous owner of the dwelling-house. The applicant purchased the property circa 2011. I understand from the applicant that there have been no issues with the existing septic tanks or the percolation area. There were no obvious smells or drainage problems evident in the vicinity of the septic tanks or the percolation area.

Having regard to the unusual arrangement of two septic tanks and the limited information available on the existing percolation area, I recommend that a new wastewater treatment system be installed and the existing septic tanks be decommissioned. I therefore requested the applicant to excavate a trial hole and percolation test holes.

Assessment:

On the 15th/16th April 2022, I carried out percolation tests in accordance with the recommendations of Code of Practice on Wastewater Treatment and Disposal Systems serving Single Houses issued by Environmental Protection Agency 2021. Based on the test results the site is suitable for the discharge of the sewage treatment effluent to groundwater.

I have recommended the installation of a Domestic Sewage Treatment Plant (Klargester BioDisc Domestic Sewage Treatment Plant, Model Reference BA, or similar approved system) with sand polishing filter as shown on Drawing No. PP-22-02: Proposed Drainage Layout Plan.

The treated water from the sewage treatment plant shall be discharged onto the mongrade sand polishing filter. The sand layer shall have a minimum total thickness of 900 mm.

The sand polishing filter shall have a plan area of 20 m2 and unit shall be constructed in accordance with the EPA 2021 Code of Practice. Details of the sand polishing filter are shown on the attached Drawing No. PP-22-09.

Signed: Patrick Joyce

Patrick C. Joyce
Patrick Joyce Associates

Date: 26th May 2022

APPENDIX A: SITE CHARACTERISATION FORM

File Reference:

1.0 GENERAL DETAILS (From planning application)

Prefix: Mr First Name: Gary Surname: McKeon

Address: Glenside House, Glassamucky, Bohernabreena, Dublin 24

Site Location and Townland: Glassamucky, Bohernabreena, Dublin 24

Number of Bedrooms: 3 Maximum Number of Residents: 5

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): AminDW - Deep well drained mineral (mainly acidic) soil

Subsoil, (Specify Type): Till derived from Metamorphic rocks

Bedrock Type: Butter Mountain Formation - Dark slate-schist, quartzite & coticule

Aquifer Category: Regionally Important | Locally Important Ll Poor

Vulnerability: Extreme ☐ High ✓ Moderate ☐ Low ☐

Groundwater Body: Status

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

Source Protection Area: ZOC ☐ SI ☐ SO ☐ Groundwater Protection Response: R1

Presence of Significant Sites (Archaeological, Natural & Historical): None identified

Past experience in the area: Suitable for development with secondary treatment system and polishing filter

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 site is potentially suitable for development with secondary treatment system and polishing filter.

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:	Site elevated relative to local roadway to east of site		
Slope:	Steep (>1:5) ☐	Shallow (1:5-1:20) ☑	Relatively Flat (<1:20) ☐
Slope Comment			

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

Houses:

There are existing houses adjacent to the site as shown on the attached Site Location Map.

Existing Land Use:

Residential garden

Vegetation Indicators:

Grass

Groundwater Flow Direction: North

Ground Condition:

Good

Site Boundaries:

Trees and hedgerows along boundaries

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Roads:

Public roadway to west and east of site

Outcrops (Bedrock And/Or Subsoil):

None

Surface Water Ponding:

None

Lakes:

None

Beaches/Shellfish Areas:

None

Wetlands:

None

Karst Features:

None

Watercourses/Streams:*

There is an existing stream running to the north of the site

*Note and record water level

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Drainage Ditches:*

None

Springs:*

None

Wells:*

No well on site

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).

There are two existing septic tanks on site which it is proposed to decommission and replace with a wastewater treatment system.

The site appears generally suitable for wastewater treatment system.

*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): 2.3

Depth from ground surface to bedrock (m) (if present): Not reached

Depth from ground surface to water table (m) (if present): 2.0

Depth of water ingress: 0.3

Rock type (if present): None

Date and time of excavation: 06-Apr-2022

Date and time of examination: 15-Apr-2022 12:00

Depth of Surface and Subsurface Percolation Tests	Soil/Subsoil Texture & Classification**	Plasticity and dilatancy***	Soil Structure	Density/ Compactness	Colour****	Preferential flowpaths
0.1 m						
0.2 m	Silty Topsoil			Soft	Brown	None
0.3 m						
0.4 m	Sandy Clay			Compact	Light Brown	None
0.5 m						
0.6 m						
0.7 m						
0.8 m						
0.9 m						
1.0 m						
1.1 m						
1.2 m						
1.3 m						
1.4 m	Silty Clay			Stiff	Dark Brown	None
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:

No rock was encountered at 2.3 metres depth.

The presence of land drain was noted circa 0.5 metre below ground level.

There was some water present in trial hole at 2.0 metres below ground level. Water was still at same level on re-inspection on the 19th April 2022.

There was no indication of mottling.

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)	800	630	670
Depth from ground surface to base of hole (mm) (B)	1,200	1,030	1,120
Depth of hole (mm) [B - A]	400	400	450
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	14-Apr-2022	14-Apr-2022	14-Apr-2022
	Time	10:00	10:00	10:00
2nd pre-soak start	Date	14-Apr-2022	14-Apr-2022	14-Apr-2022
	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	15-04-2022	15-04-2022	15-04-2022
Time filled to 400 mm	09:20	09:23	09:26
Time water level at 300 mm	11:03	12:38	11:18
Time (min.) to drop 100 mm (T_{100})	103.00	195.00	112.00
Average T_{100}			136.67

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	12:25	14:13	108.00	12:38	15:59	201.00	12:27	14:21	114.00
2	14:19	16:10	111.00	09:21	12:40	199.00	14:27	16:25	118.00
3	09:26	11:13	107.00	12:47	16:11	204.00	09:29	11:26	117.00
Average Δt Value			108.67			201.33			116.33
	Average Δt/4 = [Hole No.1]		27.17 (t_1)	Average Δt/4 = [Hole No.2]		50.33 (t_2)	Average Δt/4 = [Hole No.3]		29.08 (t_3)

Result of Test: Subsurface Percolation Value = 35.53 (min/25 mm)

Comments:

Based on Percolation Value the site is suitable for septic tank and percolation area as well as secondary treatment system and polishing filter. It is noted that the percolation rate in Test Hole No. 2 was slower than Test Hole Nos. 1 and 3.

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

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	$K_{ts} = T_f / T_m$	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_2)			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)			
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

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

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

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: <1:10

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: 35.53

Not Suitable for Development ☐ **Suitable for Development** ✓

Identify all suitable options

1. Septic tank system (septic tank and percolation area) **(Chapter 7)** — Yes
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

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)

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

It is proposed to install a Klargester BioDisc Domestic Sewage Treatment Plant (Model Reference BA), or similar approved, with a sand polishing filter as shown on the Drainage Layout Plan.

The treated water from the sewage treatment plant shall be discharged onto the monograde sand polishing filter. The sand layer shall have a minimum total thickness of 900 mm.

The sand polishing filter shall have a plan area of 20 m2 and it shall be constructed in accordance with the EPA 2021 Code of Practice.

For details of the sand polishing filter refer to Drawing No. PP-22-09.

[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: Klargester BioDisc WWTS

Capacity PE: 6

Sizing of Primary Compartment: ____ m^3

Polishing Filter*: (Section 10.1)

Surface Area (m^2)*: 20.00

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

Option 2 - Pumped Discharge Surface area (m^2): 20.00

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

DISCHARGE ROUTE:

Groundwater	✓	Hydraulic Loading Rate * ($l/m^2.d$)	60.00	Surface area (m^2)	22.50
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 sewage treatment system shall be installed and commissioned by the manufacturer. The construction of the sand polishing filter shall be carried out by the applicant and supervising Engineer and will be certified on completion to comply with the EPA Code of Practice.

The existing septic tanks shall be decommissioned i.e. emptied out and filled with inert material.

On-going Maintenance

An annual maintenance contract shall be put in place prior to the commissioning of the system.

7.0 SITE ASSESSOR DETAILS

Company: Patrick Joyce Associates, Consulting Engineers

Prefix: Mr First Name: Patrick Surname: Joyce

Address: 2 Prospect Grove,
Stocking Lane,
Rathfarnham,
Dublin 16

Qualifications/Experience: BE, CEng, MIEI, MBA

Date of Report: 26-May-2022

Phone: 087-2476375 E-mail patrickjoyceassociates@gmail.com

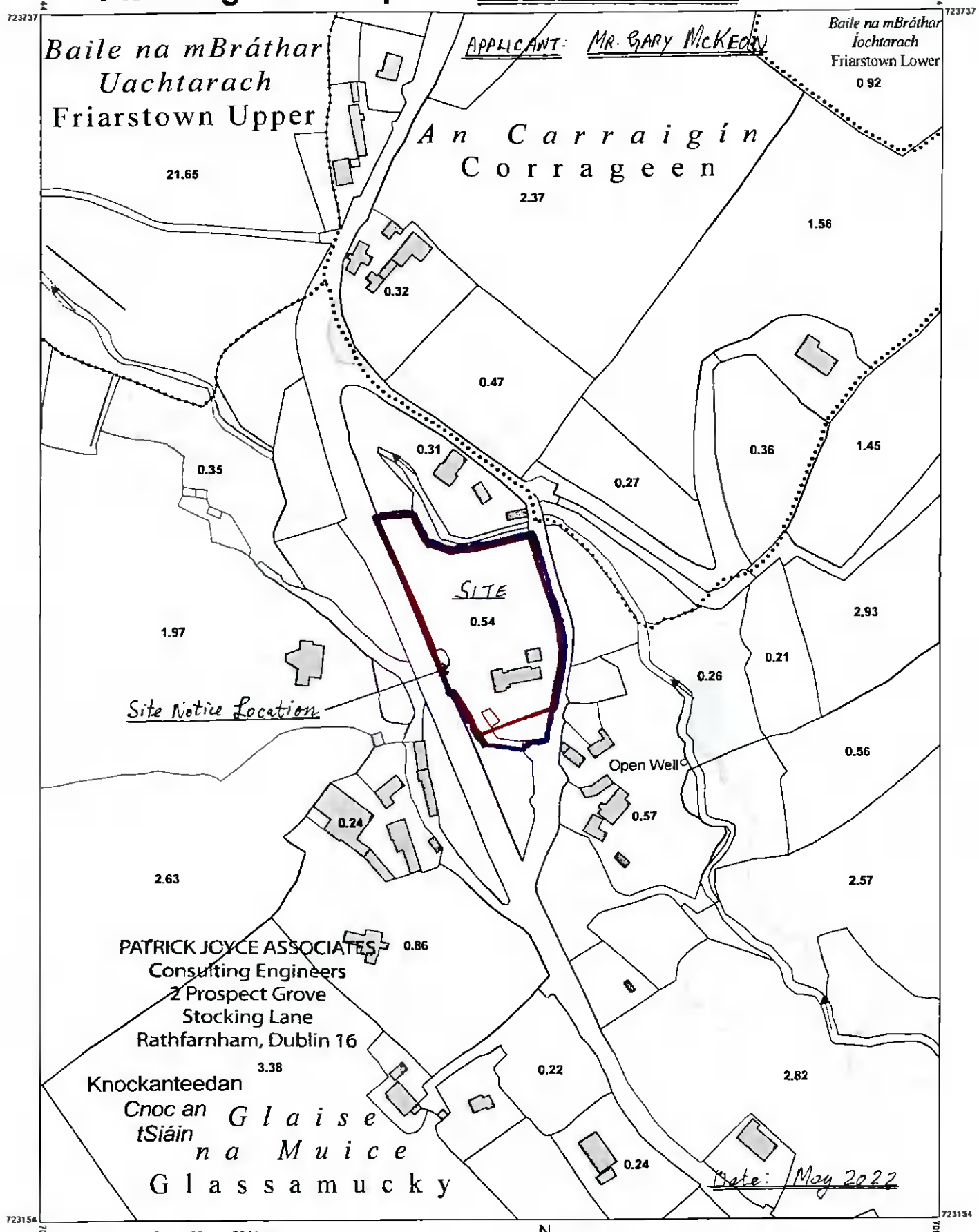
Indemnity Insurance Number: API0004258

Signature: Patrick Joyce

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

Planning Pack Map

SITE LOCATION MAP



OUTPUT SCALE: 1:2,500

CENTRE COORDINATES:
ITM 709359,723446

PUBLISHED: 01/04/2022
ORDER NO.: 50259703_1
MAP SERIES: 1:2,500
MAP SHEETS: 3453-C

CAPTURE RESOLUTION:
The map objects are only accurate to the resolution at which they were captured. Output scale is not indicative of data capture scale.
Further information is available at: http://www.osi.ie, search 'Capture Resolution'
LEGEND:
http://www.osi.ie, search 'Large Scale Legend'

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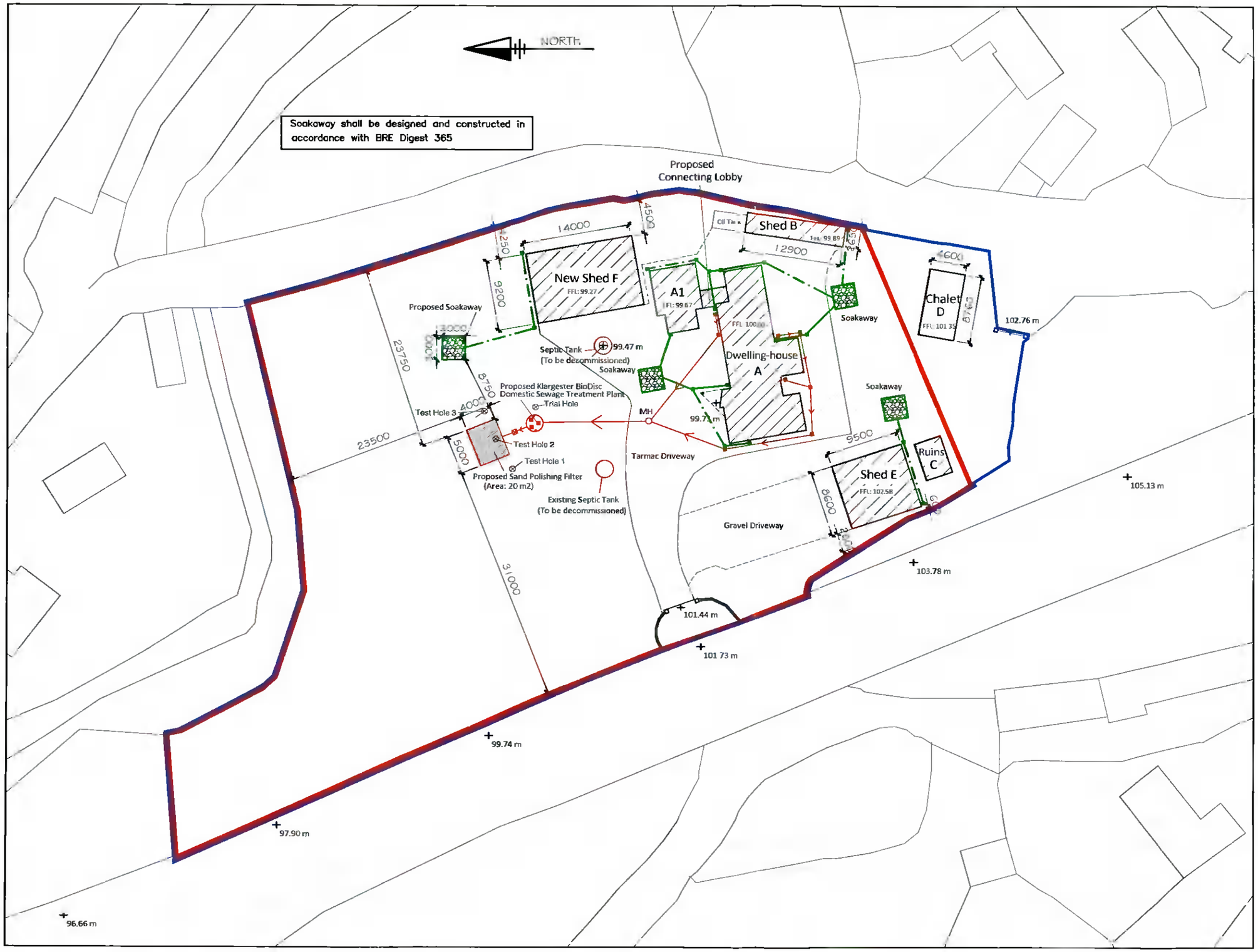


PROPOSED SITE LAYOUT PLAN SCALE 1:500 (A3)

ISSUED FOR PLANNING PERMISSION PURPOSES ONLY

MCGILLEN DESIGN SERVICES
PLANNING AND PROJECT MANAGEMENT

BURGAGE, BLESSINGTON, CO. WICKLOW.
T: (045) 891 468
M: (087) 646 9079
E. petermcgillen@hotmail.com

F	[illegible]	[illegible]	[illegible]	[illegible]
E	[illegible]	[illegible]	[illegible]	[illegible]
D	[illegible]	[illegible]	[illegible]	[illegible]
C	[illegible]	[illegible]	[illegible]	[illegible]
B	[illegible]	[illegible]	[illegible]	[illegible]
A	[illegible]	[illegible]	[illegible]	[illegible]
NO.	DESCRIPTION	BY	CHD	DATE

CLIENT
MR. GARY McKEON

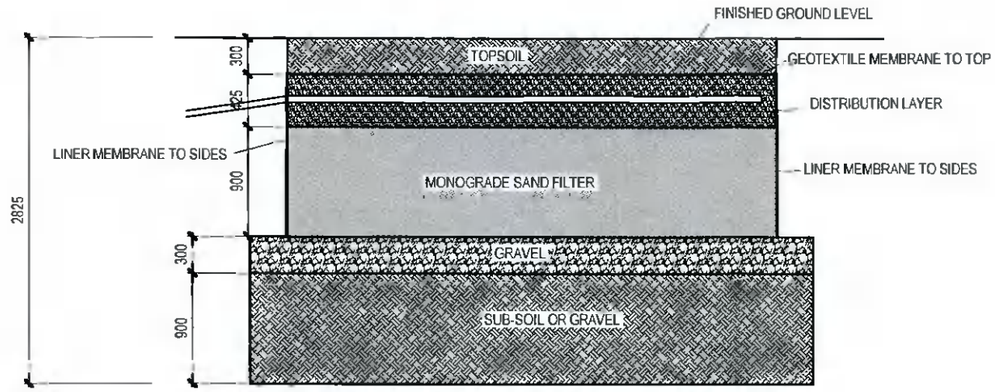
PROJECT
EXISTING DEVELOPMENT AT GLASSAMUCKY, BOHERNABREENA, DUBLIN 24

TITLE
PROPOSED DRAINAGE LAYOUT PLAN

PATRICK JOYCE ASSOCIATES
CONSULTING ENGINEERS
2 Prospect Grove
Stocking Lane
Rathfarnham
Dublin 16
Telephone: (01) 494 6745
E-Mail: patrickjoyceassociates@gmail.com

DESIGNED	CHECKED	APPD
P.J.	P.J.	P.J.
DRAWN	DATE	SCALE
P.J.	JULY–2021	1:500

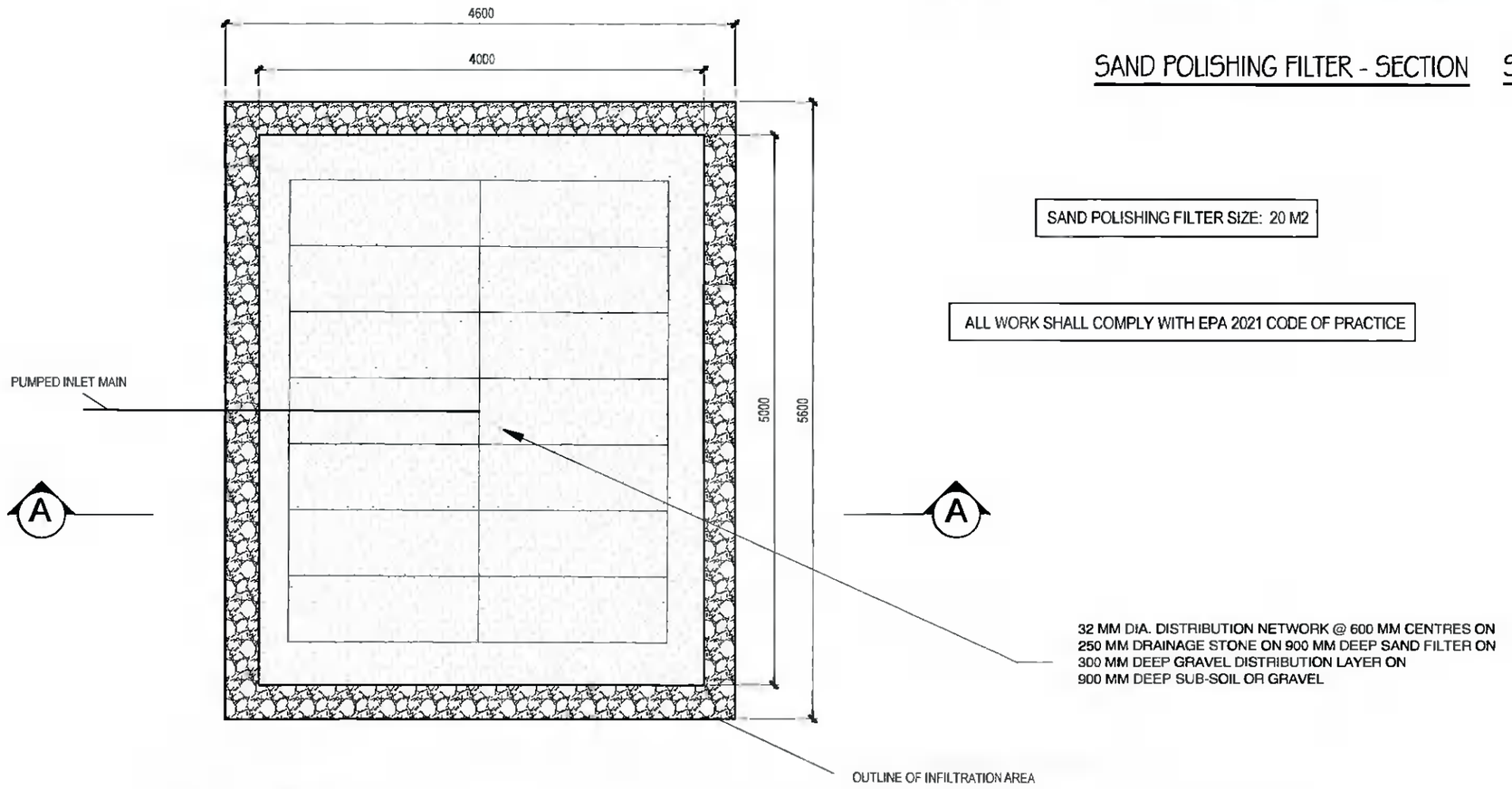
DRG.No. PP/22/02 REV. E



SAND POLISHING FILTER - SECTION SCALE 1:50 (A3)

SAND POLISHING FILTER SIZE: 20 M2

ALL WORK SHALL COMPLY WITH EPA 2021 CODE OF PRACTICE



SAND POLISHING FILTER - PLAN SCALE 1:50 (A3)

REV	DESCRIPTION	BY	APPR	DATE
A	[illegible] FOR PLANNING PERMISSION PURPOSES	P.J.	P.J.	12.04.22

CLIENT

MR. GARY McKEON

PROJECT

EXISTING DEVELOPMENT AT GLASSAMUCKY, BOHERNABREENA, CO. DUBLIN

TITLE

SAND POLISHING FILTER

PATRICK JOYCE ASSOCIATES
CONSULTING ENGINEERS

2 Prospect Grove
Stocking Lane
Rathfarnham
Dublin 16

Telephone: (01) 494 6745
E-Mail. patrickjoyceassociates@gmail.com

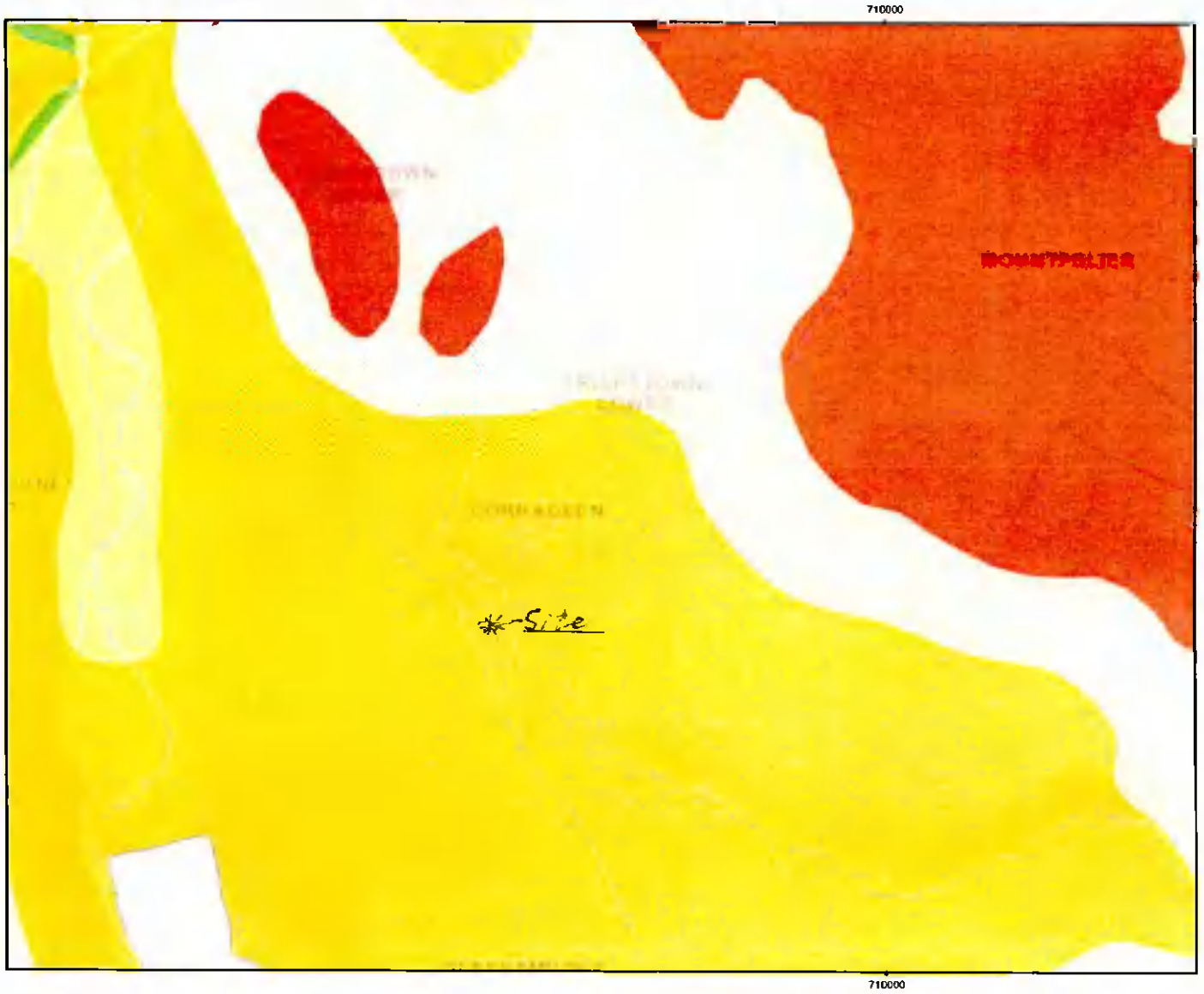
DESIGNED	CHECKED	APPRD
P.J.	P.J.	P.J.
DRAWN	DATE	SCALE
P.J.	APRIL–2022	AS–SHOWN

DRG.No. PP–22–09 REV A

[redacted] [redacted]

Geological Survey

Groundwater Data



Legend

Groundwater_Vulnerability_40K_IE...

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

Scale: 1:10,000

Geological Survey Ireland

N W E S

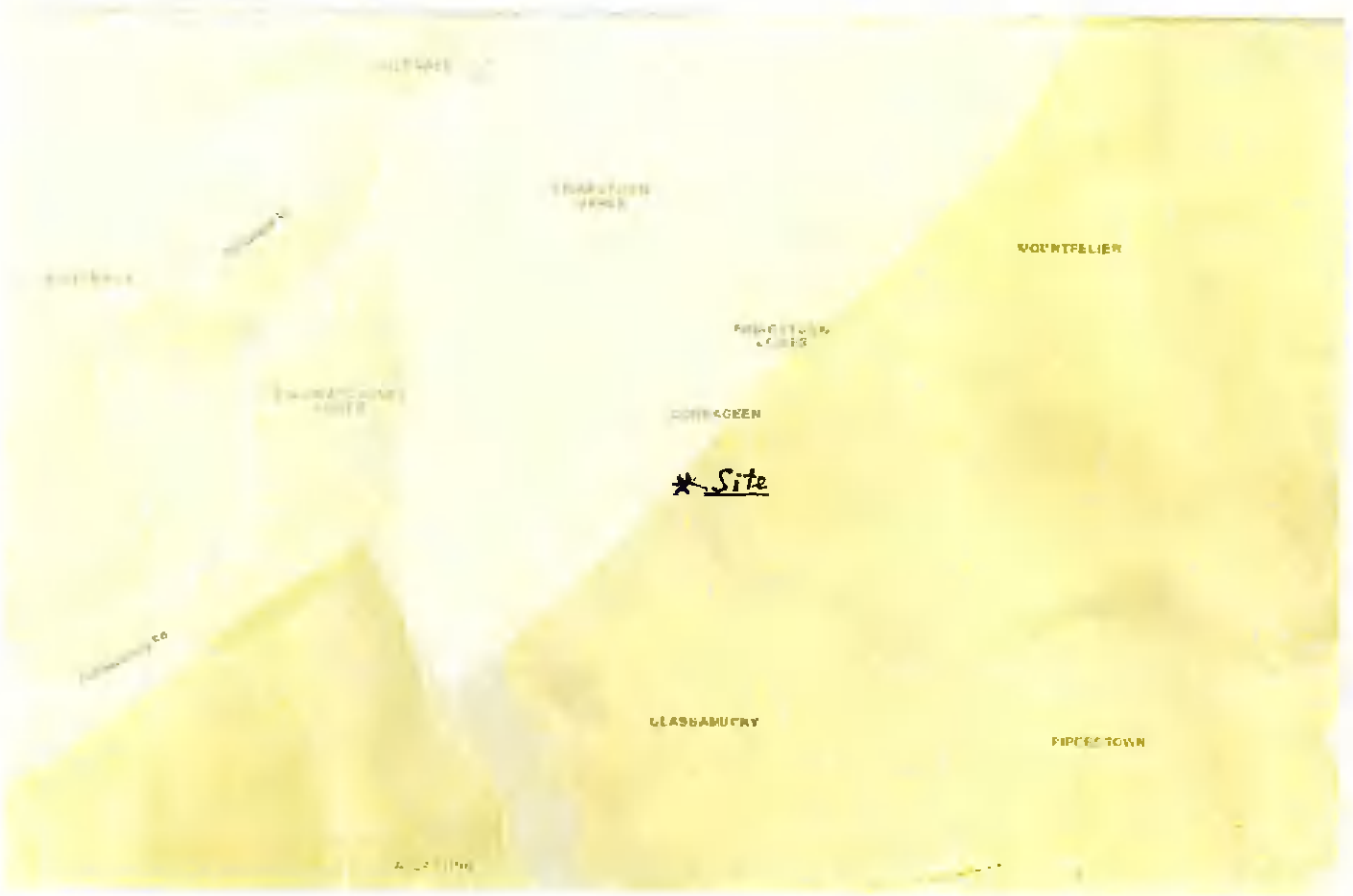
0 0.05 0.1 0.2 mi

0 0.1 0.2 0.4 km

Map Centre Coordinates (ITM) 709,535 723,657

5/26/2022, 7:54:26 AM

AQUIFER CLASSIFICATION MAP



Groundwater Resources (Aquifers)

Gravel Aquifer

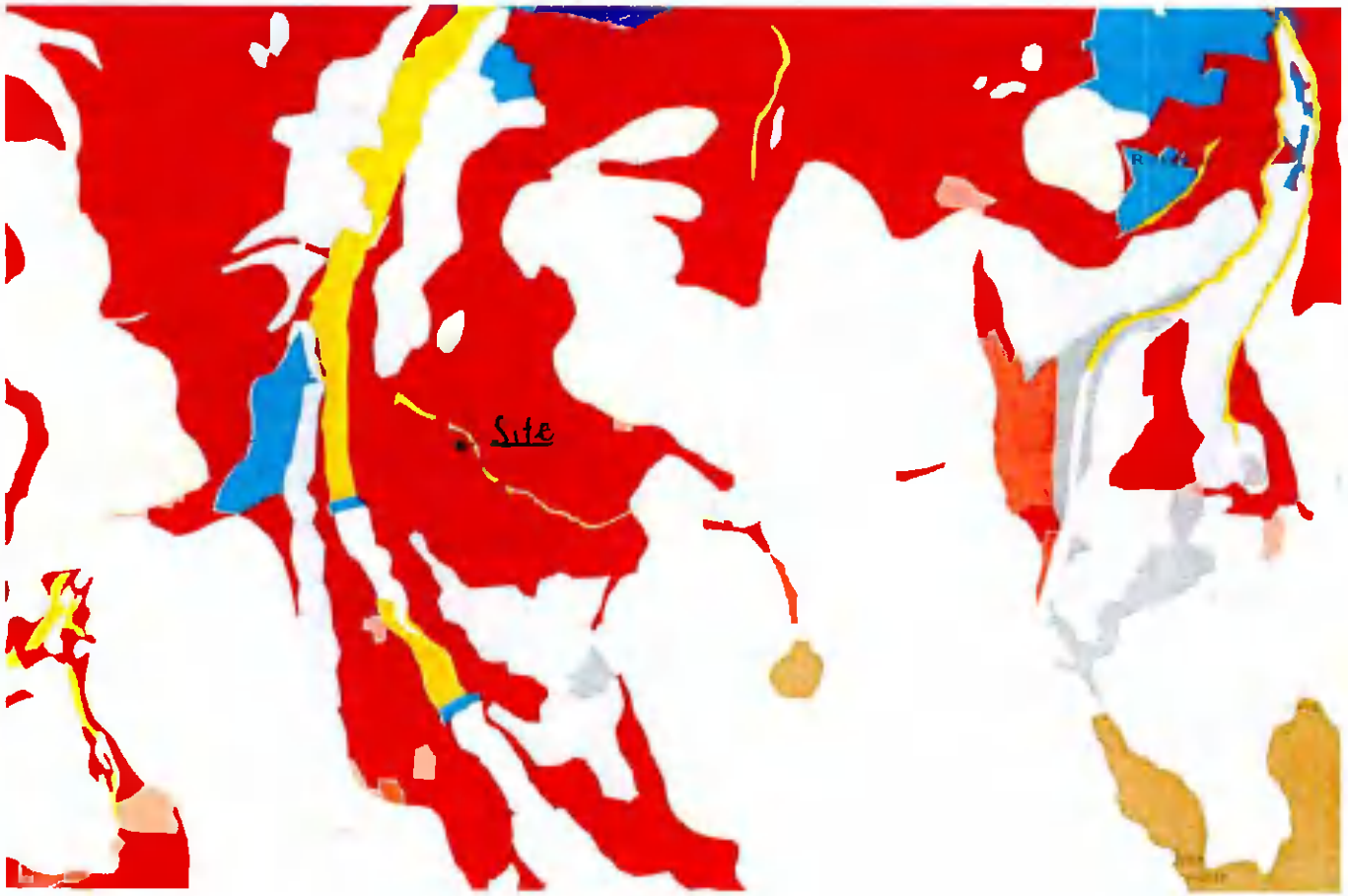
- Locally important gravel aquifer
- Regionally important gravel aquifer

Bedrock Aquifer Faults

Bedrock Aquifer

- Rkc - Regionally Important Aquifer - Karstified (conduit)
- Rkd - Regionally Important Aquifer - Karstified (diffuse)
- RK - Regionally Important Aquifer - Karstified
- Rf - Regionally Important Aquifer - Fissured bedrock
- Lm - Locally Important Aquifer - Bedrock which is Generally Moderately Productive
- Lk - Locally Important Aquifer - Karstified
- Ll - Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
- Pl - Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones
- Pu - Poor Aquifer - Bedrock which is Generally Unproductive
- Lake

Soil Classification Map



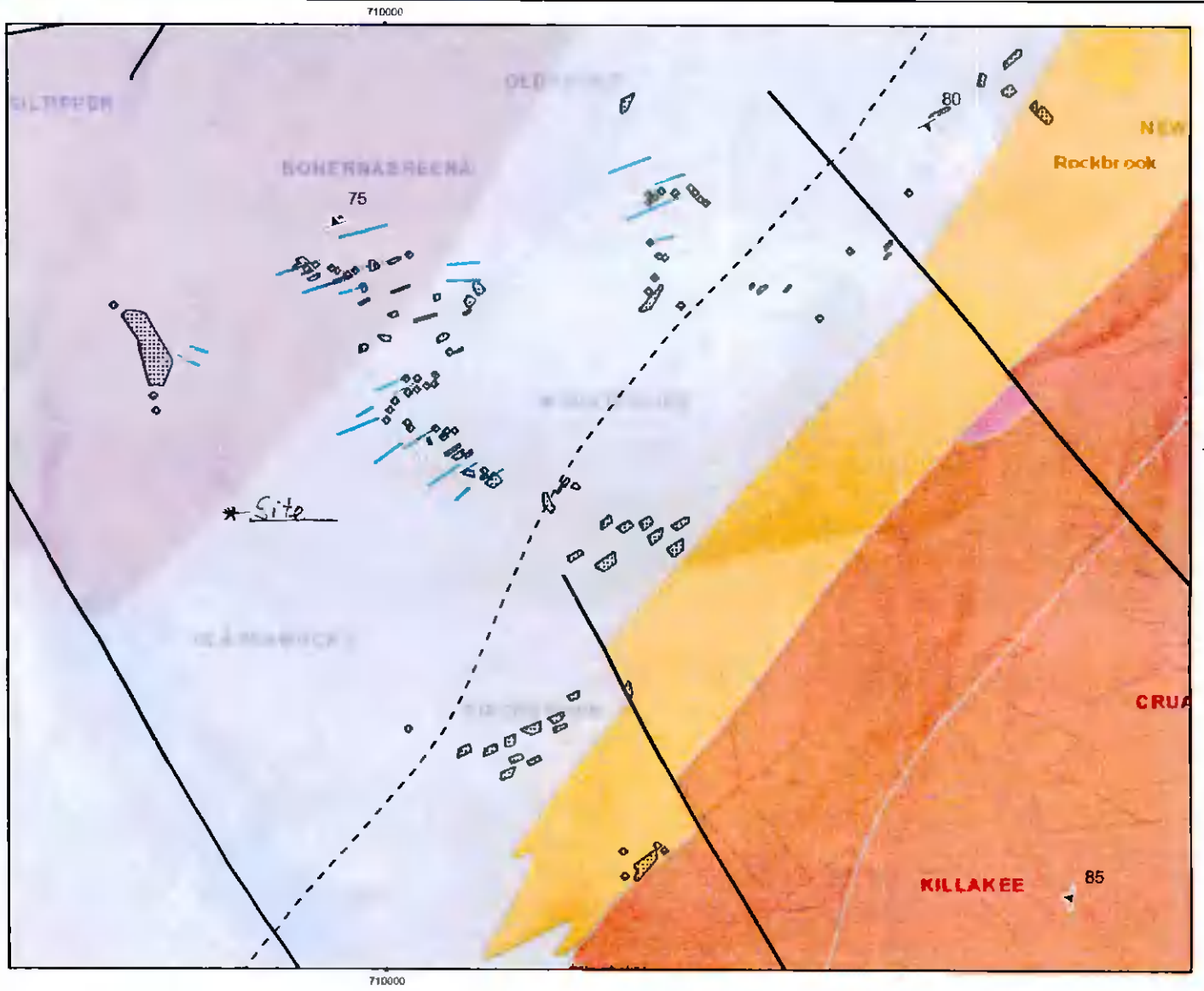
Teagasc Soils

Teagasc Soils

- 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-peatymineral 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-peatymineral complexes (Mainly basic)
- BktPt - Blanket peat
- FenPt - Fen peat
- RsPt - Raised Peat
- Cut - Cutover/cutaway peat
- AlluvMIN - Alluvial (mineral)
- AlluvMRL - Alluvial (marl)

Geological Survey

Bedrock Map



Legend

Structural Symbols 100K ITM 2018

- Strike and dip of first foliation
- Bedrock Outcrops 100 ITM 2018

Bedrock Linework 100k ITM 2018

- Area
- Dyke
- Fault

Bedrock Polygons 100k ITM 2018

- Lucan Formation
- Type 1 granodiorite
- Type 3 muscovite porphyritic
- Type 2e equigranular
- Type 2p microcline porphyritic
- Aghfarrell Formation
- Butter Mountain Formation
- Pollaphuca Formation

Scale: 1:25,000

Geological Survey Ireland

N W E S

0 0.175 0.35 0.7 mi

0 0.275 0.55 1.1 km

Map Centre Coordinates (ITM) 710,863 723,499

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PHOTOGRAPH NO. 1 - TRIAL HOLE

PHOTOGRAPH NO. 2 - TRIAL HOLE

PHOTOGRAPH NO. 3 - TEST HOLE LOCATION

PHOTOGRAPH NO. 4 - TEST HOLE NO. 1

PHOTOGRAPH NO. 5 - TEST HOLE NO. 2

PHOTOGRAPH NO. 6 - TEST HOLE NO. 3

Water Management Solutions

Klargester BioDisc®
Domestic Sewage Treatment Plant

Kingspan

kingspan.ie/klargester

Klargester BioDisc®
Domestic Sewage Treatment Plant

The Klargester domestic BioDisc® is engineered to treat wastewater to the highest level of standards and offers one of the lowest lifetime costs compared to other treatment processes.

Each Klargester BioDisc® provides an engineered package solution to meet a wide range of applications and discharge qualities. It is designed to ensure 100% compliance with industry requirements including international regulations such as EN 12566-3.

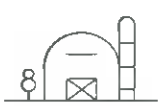
Product Benefits

- Utilises Rotating Biological Contactor technology.
- Low running costs.
- Low level visibility with a lockable child-proof cover – safe for children and pets.
- For NIEA, BA-BC models deliver 95% pollution removal, whilst the BioDisc+P achieves 97.8% for BOD removal.
- 10 year warranty options available when purchased with a service and maintenance plan.
- Supplied with a control panel and alarm.
- Managed Flow System.
- Totally silent in operation.
- The most stable process in the market.
- Controls the discharge volume.

Applications:

The Klargester domestic BioDisc® BA–BC range is suitable for a variety of applications including:


Single & Multiple Homes


Barn Conversions


Small Offices


Light Industrial Premises


Farms

kingspan.ie/klargester

Klargester BioDisc®
How it Works

Noise Free

The Rotational Biological Contactor

The RBC is central to the operation of each Klargester BioDisc®. It supports a biologically active film or biomass onto which aerobic micro-organisms, naturally found in sewage, become established. Natural breakdown of sewage can then occur as described below.

The RBC comprises banks of vacuum formed polypropylene media supported by a steel shaft. This is slowly rotated by a low energy consumption electric motor and drive assembly.

Our robust Klargester BioDisc® models cater for properties housing between 4-18 people. The premium BioDisc® sewage treatment system is available in four sizes for all types of domestic applications.

For single house applications we offer the BA and BA-X models and, for multiple homes, the Klargester BB and BC BioDisc® models offer the perfect solution.

01

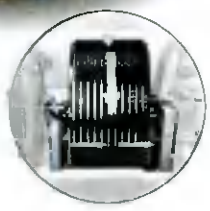
Primary Settlement Tank

Wastewater and sewage flows into the primary settlement tank where the large solids are retained for future removal.

02

First Stage Biological Treatment

The liquor and fine solids then flow into the Biological Treatment Zone 1 where the first stage of treatment occurs.



03

Second Stage Biological Treatment

The liquor is then fed forward at a controlled rate into Biological Treatment Zone 2 for further cleaning.

04

Final Settlement Tank

The clean liquid passes into the final settlement tank where it can be discharged to ground or watercourse.

More than 60 years experience

Technical Specifications

Model Reference	BA*	BA-X	BB	BC
Population Equivalent (Std Flow)	6	9	12	18
Maximum Daily BOD (kg)	0.36	0.54	0.72	1.08
Maximum Daily Flow (m^3)	1.2	1.8	2.4	3.6
Ø/Width (mm)	Ø1995	Ø1995	Ø1995	Ø2450
Length (mm)	-	-	-	-
Inlet Invert depth (mm)	450/750/1250	450/750/1250	450/750/1250	600/1100
Depth Below Inlet Invert (mm)	1400	1400	1400	1820
Outlet Invert depth (mm)	1315	1315	1315	1735
Overall Height (mm)	2160/2460/2960	2160/2460/2960	2160/2460/2960	2825/3325
Height to Rim of Cover (mm)	1945/2245/2745	1945/2245/2745	1945/2245/2745	2485/2985
Empty Weight (kg)	310/325/380	310/325/380	335/350/405	650/750
Standard Power Supply	1 phase	1 phase	1 phase	1 phase
Motor Rating - 1 Phase (Watts)	50	50	50	75
Full Load Current 1 Phase (amps)	0.51	0.51	0.51	1.1
Optional Power Supply	N/A	N/A	N/A	3 phase
Motor Rating - 3 Phase (Watts)	N/A	N/A	N/A	90
Full Load Current 3 Phase (amps)	N/A	N/A	N/A	0.38
Sludge Return Pump Rating (watts)	250	250	250	250

** BA BioDisc - S.R 66.2015 compliant.*
Pumped Outlet Available on BA, BA-X, BB models.

Performance and Compliance

- Certified to European Standard BS EN 12566 Part 3.
- Performance certified to achieve 10mg/l BOD, 15mg/l SS and 3.8mg/l ammonia.
- Fully marked in line with the CPR 2013.
- Building control and S.R.66:2015 compliant (BA BioDisc).

Kingspan

Case Studies

Case Studies

BioDisc® Sewage Treatment Plants: Reliable and Low-Cost to Run

A Klargester BioDisc® sewage treatment plant, installed in 1990, has been trouble-free for its owner ever since, requiring very little on-going maintenance.

Engineers from Kingspan's local Accredited Installer for the Klargester Product Range were recently asked to undertake a routine service. The engineers only needed to replace some of the nylon bushes (replaced with drive belts in more recent models) that help run the Rotational Biological Contactor (RBC), which is central to the working of each Klargester BioDisc®.

"Klargester BioDisc® sewage treatment plants are incredibly reliable and low cost to run, I've had no problems with it at all," said the homeowner. "I'm very happy to recommend the Klargester BioDisc®.

Treating wastewater and capturing rain in Barnstorming Build

BioDisc sewage treatment plant installed in award-winning 19th Century barn conversion.

A beautiful, award-winning 19th Century barn conversion with sustainability built into the fabric of the building, needed an effective off-mains drainage solution and to reduce its reliance on mains water The farm had previously been served by a septic tank, but the development of the barn gave the opportunity for an upgrade in the drainage solutions.

Our recommended solution was a Klargester BioDisc® sewage treatment plant to service both the conversion and the neighbouring farmhouse; this highly efficient solution will remove up to 95% of the pollutants in sewage effluent. We also supplied a Raintrap rainwater harvesting system, to capture rainwater for external uses such as watering plants and cleaning farm vehicles. The barn conversion has been awarded the prestigious LABC Building Excellence awards for its build quality and the sustainability quotient.

A quiet solution for a 4-bedroom property and the neighbours

Having consulted local Klargester experts, a 4-bedroom property located on a relatively small plot of land, installed a Klargester BA BioDisc® sewage treatment system connected to the surface water drainage culvert.

Sited in a central village location, a system powered by an air blower may have caused the normally-quiet humming of the blower to reverberate around the high stone walls surrounding the garden and become a nuisance.

For this principle reason, the unique Klargester BioDisc® sewage treatment system was recommended. The motor-driven rotating discs inside the system, provide the treatment for incoming sewage, so there is no external air blower to locate and maintain.

As the Klargester BioDisc® provides full treatment of sewage, suitable for discharge directly into a watercourse, the connection to the drain in this restricted area was ideal for the customer. Being a straightforward installation of a compact system, the entire installation only took 3 days from start to finish!

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Kingspan

Prüfinstitut für Abwassertechnik GmbH

PERFORMANCE RESULTS

Kingspan Environmental Limited
College Road North, Aston Clinton, Aylesbury, HP22 5EW, UK

EN 12566-3:2005, Annex B
Small wastewater treatment systems for up to 50 PT

Small wastewater treatment system BioDisc + P
Rotating Biological Contactor (RBC) in a GRP tank

PIA2006-039B17

Nominal organic daily load	0.25 kg BOD_5/d		
Nominal hydraulic daily load	1.00 m^3/d		
Material	Glass reinforced plastic (GRP)		
Treatment efficiency (nominal sequences)		Efficiency	Effluent
	COD	91.3 %	39 mg/l
	BOD_5	97.8 %	5 mg/l
	NH_4-N	62.1 %	12 mg/l
	P_{tot}	94.2 %	0.4 mg/l
	SS	95.1 %	13 mg/l
Electrical consumption	1.4 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.

Not fied Body No 1739

Certified according to ISO 9001:2008

DAkkS Deutsche Akkreditierungsstelle D-PL-17712-01-00

Prüfinstitut für Abwassertechnik GmbH
geprüft - tested - testé

Elmar Lancé June 2016