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Natura Impact Statement

PRESENTED TO

**Mr. Michael Monagle
Annakisha Pig Farm**

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Environmental Consultancy Services

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1 INTRODUCTION

1.1 Background

Enviroguide Consulting was commissioned by NRG E acting on behalf of Mr. Michael Monagle, to prepare an Appropriate Assessment (AA) Screening Report for submission to the Environmental Protection Agency (EPA) as part of a license review application in relation to a pig fattening house (Reg. Ref. 14/05815), associated feed mixing room and pig walkway at Annakisha Pig Farm, hereafter referred to as 'Development' or 'Site', when referring to the application Site area. The AA Screening Report concluded that a degree of uncertainty exists in whether the Development could give rise to potentially significant effects on a nearby European site, namely:

- Blackwater River (Cork/Waterford) SAC (002170).

In addition, the AA Screening Determination carried out by EPA in November 2023 as part of the license review identified a further three European sites to be considered as part of this NIS, particularly in relation to potential air quality impacts and ammonia deposition, namely:

- Kilcolman Bog SPA (004095),
- Ballyhoura Mountains SAC (002036),
- Carrigeenamronety Hill SAC (002037).

Therefore, a Natura Impact Statement (NIS) has been prepared for the Development. The purpose of this NIS report is to provide information for the relevant competent authority to carry out a Stage 2 Appropriate Assessment in respect of the Development.

1.2 Quality Assurance and Competence

Enviroguide Consulting is a multi-disciplinary consultancy specialising in the areas of the Environment, Waste Management and Planning. All Enviroguide consultants carry scientific or engineering qualifications and have a wealth of experience working within the Environmental Consultancy sectors, having undergone extensive training, and continued professional development.

Enviroguide Consulting as a company remains fully briefed in European and Irish environmental policy and legislation. Enviroguide staff members are highly qualified in their field. Professional memberships include the Chartered Institution of Wastes Management (CIWM), the Irish Environmental Law Association and Chartered Institute of Ecology and Environmental Management (CIEEM).

All reporting has been carried out by qualified and experienced ecologists and environmental consultants. EJD, Project Ecologist with Enviroguide, undertook the desktop research for this report. EJD is an experienced ecologist with an extensive breadth of experience in habitat surveying, plant and ecosystem science and research, and environmental sustainability. EJD completed her PhD in Plant Nutritional Variation and Large Mammal Ecology at Leiden University in the Netherlands, holds an MSc in Environmental Archaeology (Botany) from University College London, an MSc in Environmental Sustainability from University College Dublin, and ecological and

environmental research experience at the University of Cambridge, the Nutritional and Isotopic Ecology Lab at the University of Colorado Boulder, and environmental policy experience at the Department of Environment, Food and Rural Affairs (DEFRA), the Office of Electricity and Gas Markets (Ofgem), and various other institutions. EJD has a wealth of experience in desktop research, literature scoping-review, and report writing, as well as practical field experience (habitat surveys, invasive species surveys and botanical surveys and bat surveys). Additionally, EJD both has experience, and is academically trained, in compiling Biodiversity Chapters of EIARs, full EIARs (including archaeology, natural/cultural heritage, landscape assessment alongside ecology/biodiversity considerations), AA reports and NIS reports, and in the overall assessment of potential impacts to ecological receptors from a range of developments.

1.3 Description of Development

1.3.1 Site Location

The Site is located at Annakisha North, Doneraile, Co Cork. The facility is located in the townland of Annakisha 3.7km south of Doneraile, 6.7km northeast of Mallow and 1.5km west of Annakisha church. The surrounding land is used primarily for agriculture (both tillage and pasture). Areas of forest also surround the Site, and the N73 national road is situated c1.1 km southeast of the Site (Figure 1). The existing Site consists of 4.2 hectares.

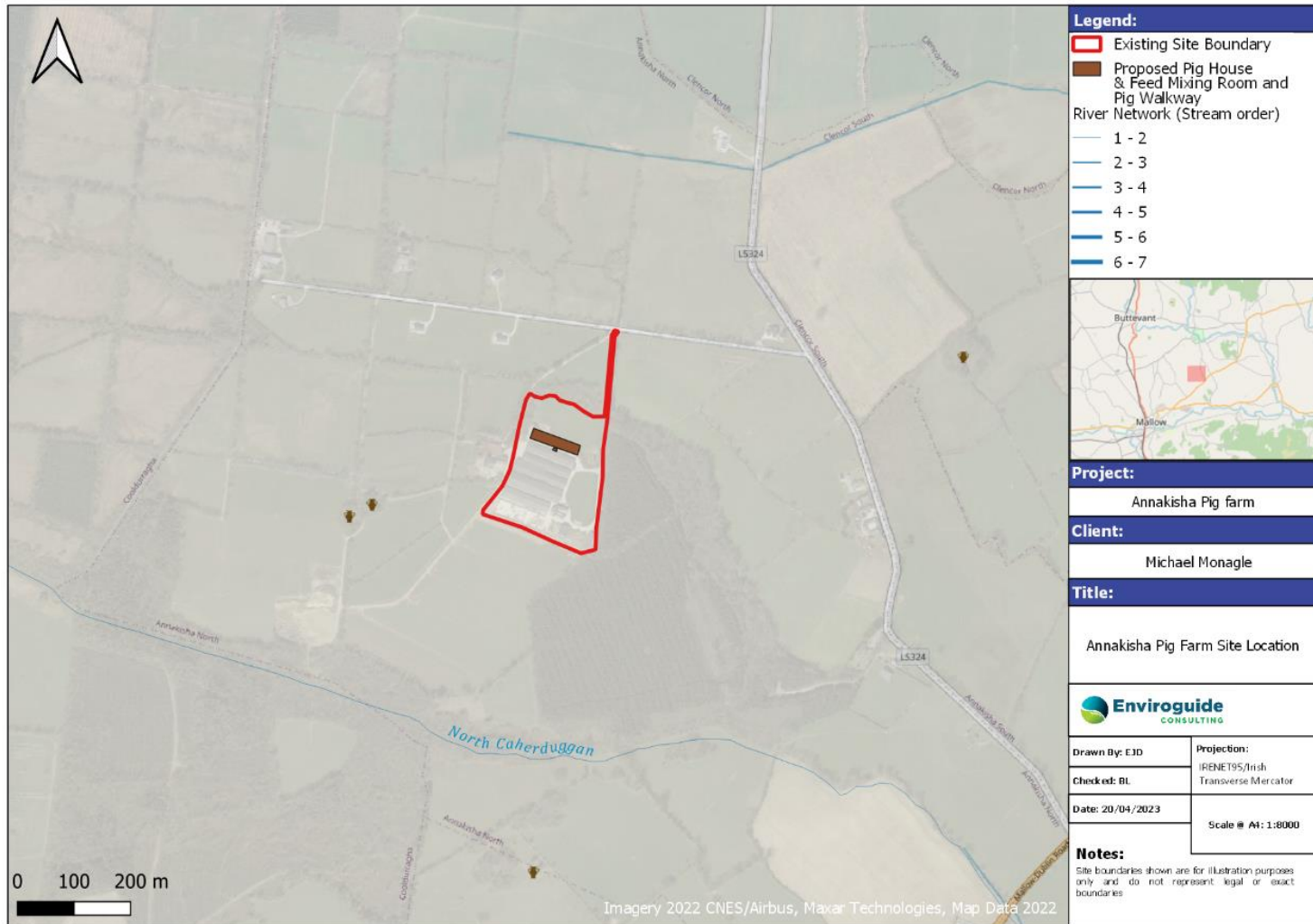


FIGURE 1. SITE LOCATION.

1.3.2 Development Description

The existing pig farm at Annakisha North is an EPA licensed installation with 780 sows in an integrated unit. The installation comprises animal houses, manure collection and storage tanks, ancillary structures, and equipment necessary for the accommodation, management and husbandry of the animals, and the administration of the enterprise. There are 15 structures on the site: 7 large pig houses with underfloor slatted tanks between 0.6 and 1.5 meters deep, a feed mixing building with 15 silos (grain, feed, liquid feed tanks, and a water tank) around it, a dry feed store and an isolation pig house. 780 sows and their progeny are kept on site (Figure 2).

The structures and equipment on the Site were designed and installed for the purpose of breeding and rearing pigs for sale off the site for processing into human food by the pork/bacon industry.

The Development consists of a 'purpose built' pig fattening house and associated feed mixing room and pig walkway at the Site. The Development is located on an area within the northernmost part of a single, intensively managed agricultural field to the north of the licensed buildings (Figure 3).

The proposed stock numbers for which the applicant is applying for EPA licencing are outlined in Table 1 below.

TABLE 1. PROPOSED STOCK NUMBERS TO BE CATERED BY THE PROPOSED DEVELOPMENT

Pig Type	Number
Dry Sows	690
Farrowing Sows	164
Boars	40
Maiden Gilts	120
Weaners	4400
Fatteners	4800

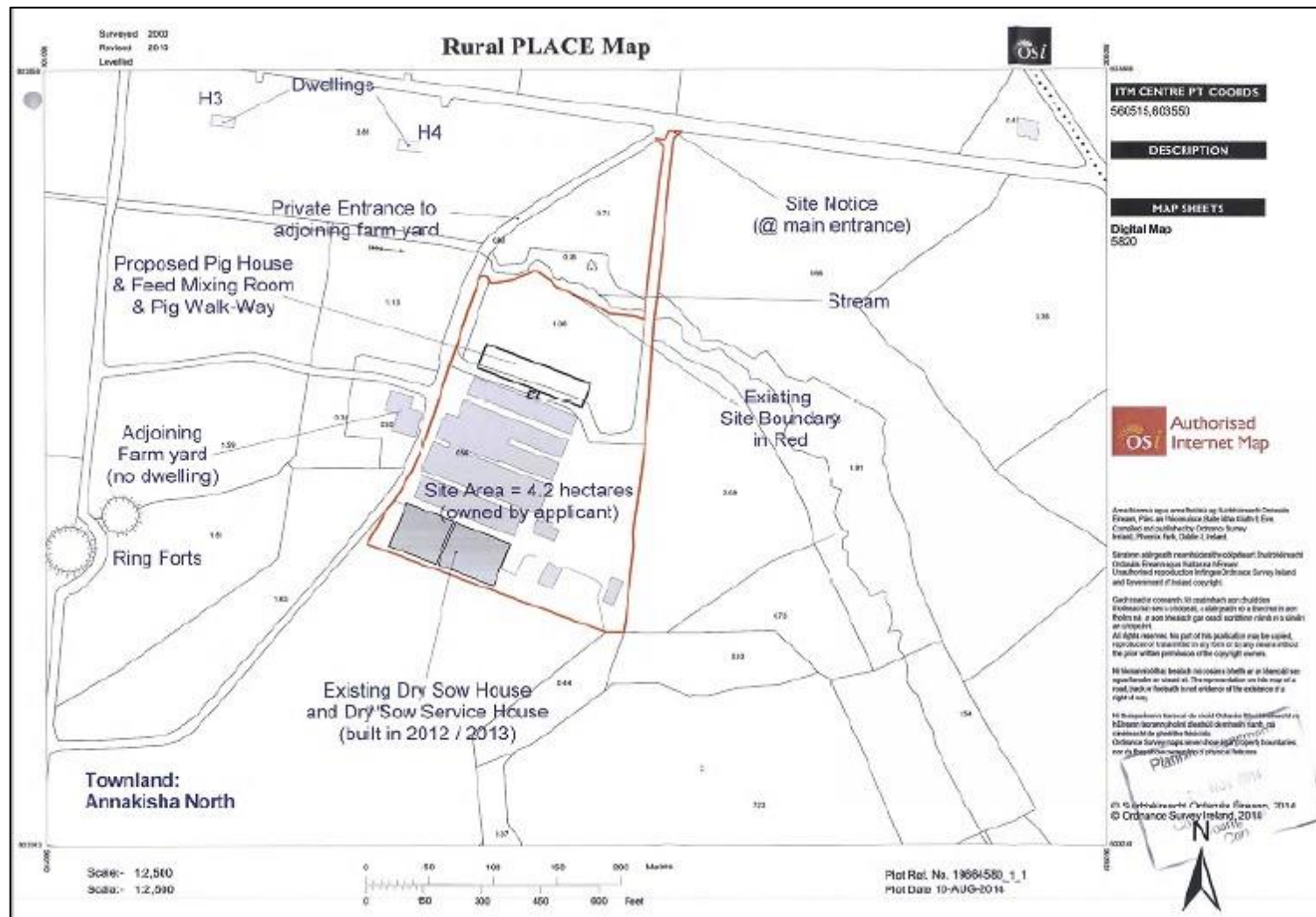


FIGURE 2. LICENSED & PROPOSED INFRASTRUCTURE. OSI MAP REPRODUCED FROM FI DRAWING .

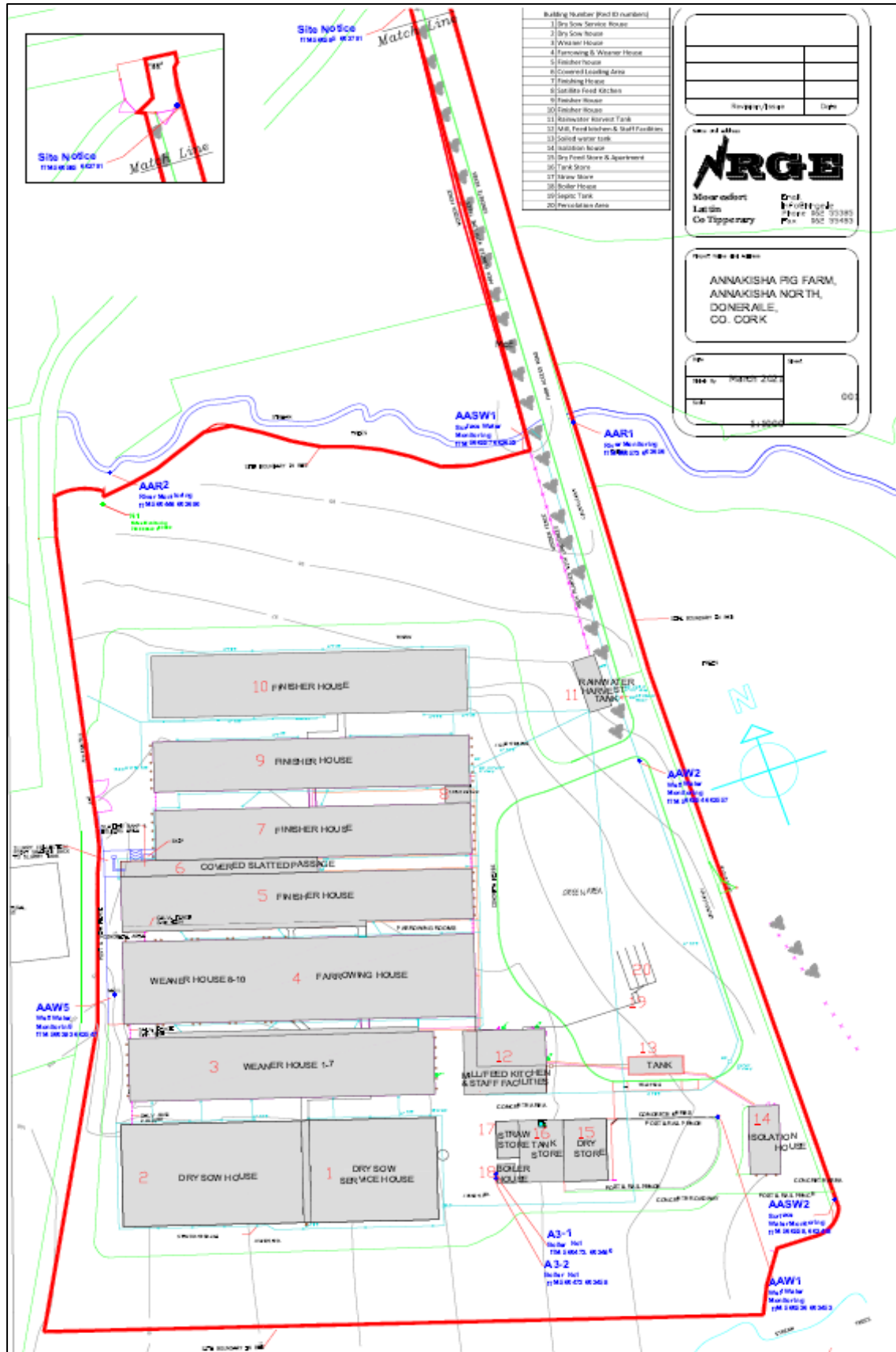


FIGURE 3. EXISTING AND PROPOSED INFRASTRUCTURE- DETAILED. NRGE.

The finishing house is 87.6m x 18.2m and approximately 6.3m high. The feed mixing room is 7m x 4m and approximately 3.6m high. The solid floor pig walkway is approximately 17m x 1.8m. The finishing house consists of white/grey concrete panelled walls to an eaves height of 2.6m over mass concrete tanks under ground level (2.7m deep with one 3m deep channel). The roofs consists of metal and timber members supporting a green roof cladding. There is a mechanical ventilation system in the finishing house.

As part of the construction, the Site was lowered to the same level as the existing buildings. Approximately 4,500m³ of soil was excavated and levelled over an area of 3,000m². The resulting spoil was spread and re-seeded over the area shown in purple in Figure 4. Additional organic manure (+33%) arising from the Development will be applied to agricultural fields as fertiliser.



FIGURE 4. IN-FILL AREA.

Below is a list of all relevant planning permissions obtained from Cork County Council with respect to the pig unit to the present date:

- Reference Number 951435: Extension to Pig Unit
- Reference Number 991130: Construction of Dry House and retention of fattening + isolation houses + extensions to farrowing, dry sow, weaner + fattening houses, office, mixing room
- Reference Number 125695: Construction of Dry Sow and Service House
- Reference Number 125086: Construction of Dry Sow and weaner House
- Reference Number 145815: Construction of Fattening House and Associated feed mixing room and pig walkway.

The production process on this farm will be similar to other such Pig units throughout Ireland and will be in line with the **requirements of the Department of Agriculture, Food & Marine and Bord Bia**. The applicant will be responsible for the feeding, management, and husbandry of the pigs and for ensuring that all of the required records are maintained.

In addition to the potential impacts relating to the construction of the Development, this application relates to the operational activities of the Development requiring an integrated pollution prevention and control licence, namely activity Classes 6.2(a) and (b).

- Class 6.2(a):
 - The rearing of pigs in an installation where the capacity exceeds 750 places for sows.
- Class 6.2(b):
 - over 30kg.

The site and its activities are classified as intensive agriculture by the EPA and are assigned the current licence no. P0446-01. A licence review application is being made to the EPA in respect to the additional built pig unit, i.e., the Development. Hence the relevant additional metrics, such as slurry storage and agricultural emissions are considered in this report.

1.3.3 Drainage and Water Supply

1.3.3.1 Surface water

Pig farms can have an impact on surface water quality if they are not managed properly. Pig waste, which contains nutrients such as nitrogen and phosphorus, can be a source of pollution if it enters surface water through runoff or other pathways. Excessive nutrients in surface water can lead to algal blooms and oxygen depletion, which can harm aquatic life. As such, surface water features nearby the Development are considered as part of the Site's drainage.

The location of the Site relative to local surface waters is shown in Figure 5. An unnamed stream, an extension of the *Annakisha South* stream, flows (west to east) 300m north of the Site. The second order waterbody *North Caherduggan*, a tributary of the *Carrig River*, flows west to east roughly 300m south of the Site (EPA 2023) (Figure 5).

The *Horseclose* and *Richardstown Rivers* (both tributaries of the *Awbeg River*) is located c.1.5 km northwest of the site, and the *Monanimy Lower River* is located c.1.8 km northeast of the site. Although these rivers flow northwards at this location, the *Awbeg River* flows eastwards and the *Monanimy Lower River* converges with the *Blackwater River* further downstream, flowing toward the southeast.

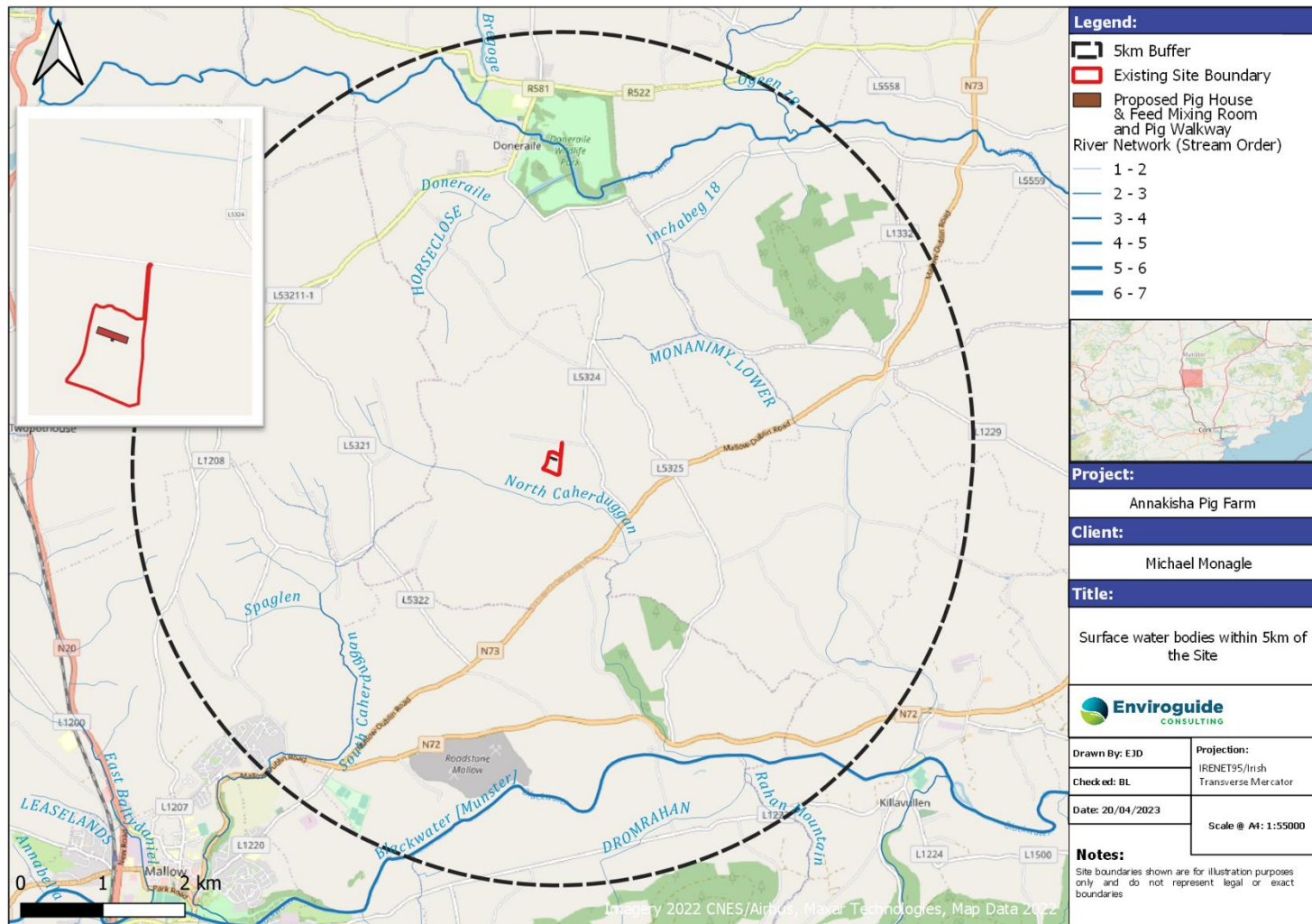


FIGURE 5. SURFACE WATER BODIES WITHIN 5KM OF THE SITE (INSET: UNNAMED STREAM)

The Site has three groundwater production wells (Figure 6). A groundwater production well is a type of well that is drilled into an aquifer to extract water.

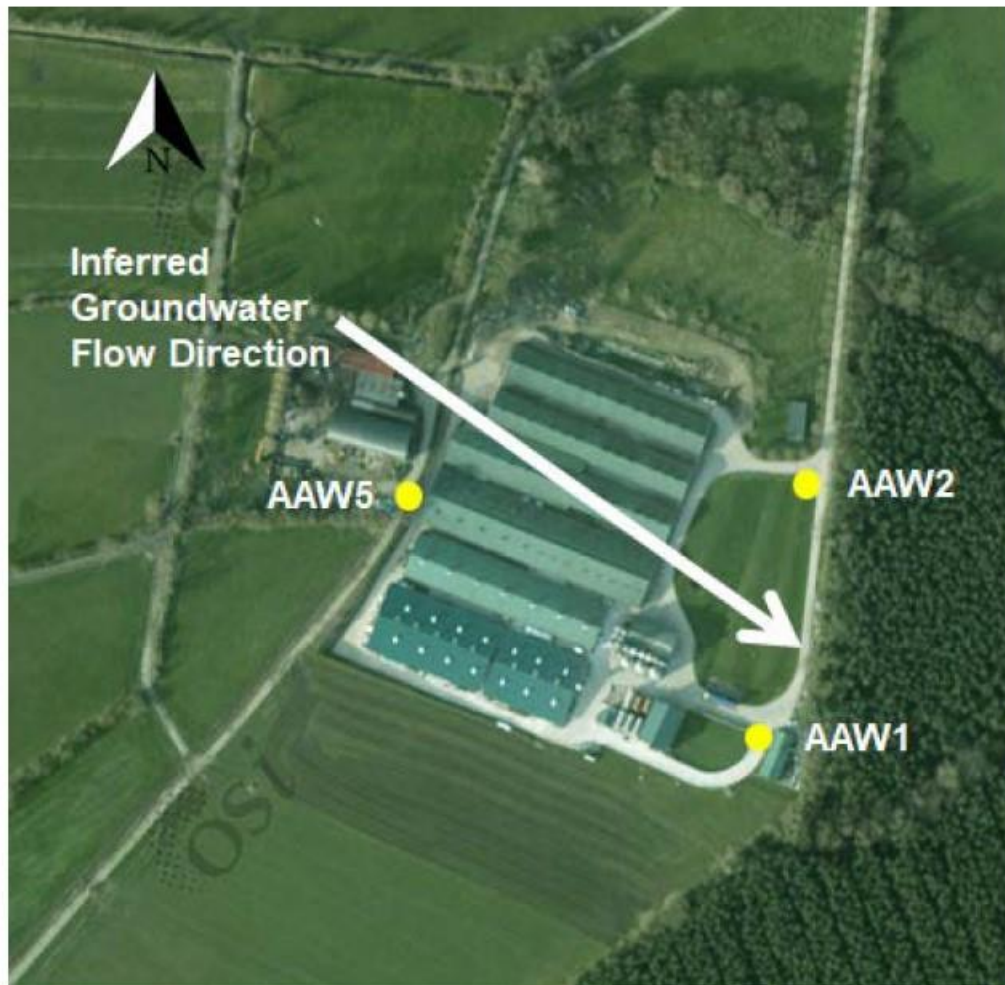


FIGURE 6. LOCATION OF PRODUCTION WELLS AND GROUNDWATER FLOW DIRECTION. PIPE, TANK & GROUNDWATER ASSESSMENT BY IE CONSULTING, 2021.

Potable water is sourced via the two onsite wells AAW1 and AAW5 (AAW2 is a new, additional well) that are monitored annually under Schedule 4 (iii) of the current EPA licence P0446-01 (Figure 9). EPA site inspections are carried out regularly at the enterprise, the most recent in 2023. All results have been within the normal range for these parameters, and do not indicate any negative influence from the Site facility. These results will continue to be reviewed against future analysis for any indicative changes. There is one new additional well, AAW2, that will be monitored annually and for the same parameters as AAW1 and AAW5.

1.3.3.2 Storm Water

At the time when the 2015 Natura Impact Statement (NIS) produced by Matthew Hague (Hague 2015) was prepared, surface (storm) water arising on the pig farm was directed to a rainwater harvesting tank, in which the water was stored and used in power washing (Figure 7). Approximately 24,000m³ of storm water is generated each year according to the 2014 EIS, and the receiving stream is the Carrig River Catchment area.

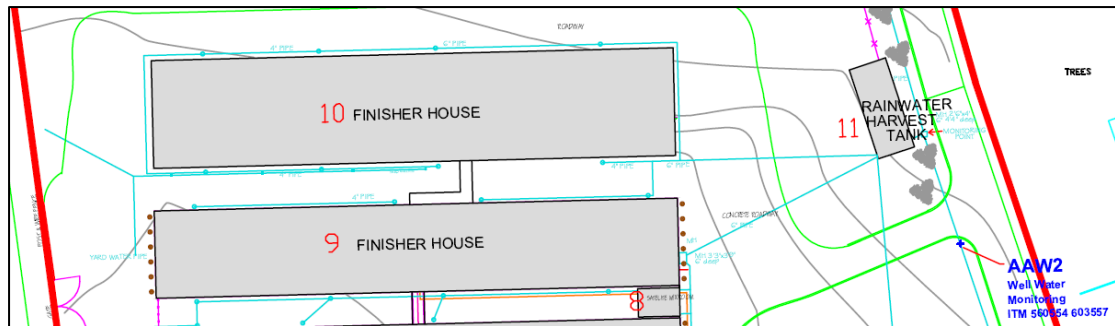


FIGURE 7. RAINWATER HARVESTING TANK. REPRODUCED FROM NRGE DRAWINGS.

Water not used on the farm was described as discharged to an adjacent stream, via an inspection chamber at the entrance bridge (Figure 8).



FIGURE 8. BRIDGE INSPECTION CHAMBER, AAR1. REPRODUCED FROM NRGE DRAWINGS.

The Development is connected to the existing site infrastructure including all surface, storm, and foul water systems that were built in accordance with the 2015 NIS (Hague 2015). It is noted that the increase in roof area has led to an increase in surface water runoff. The rainwater harvesting tank is inspected at regular intervals by the EPA as part of the monitoring procedures associated with the intensive agriculture license.

The March 2023 Non-Technical Summary of the current license review application (NRGE, 2023) states that storm water from roofs and clean yards will discharge to field drainage via a storm water collection system. The storm water discharge points will be regularly checked, inspected, and monitored. There will be no discharge of any soiled water or any effluent from the Site to any watercourse or to groundwater.

Storm water points are shown in Figure 9. These storm water points are monitored as part of regular EPA inspections for intensive agricultural licensed enterprises. AASW1 has always been in compliance with licence conditions and an additional storm water point AASW2 will be monitored quarterly for the same parameters as AASW1.

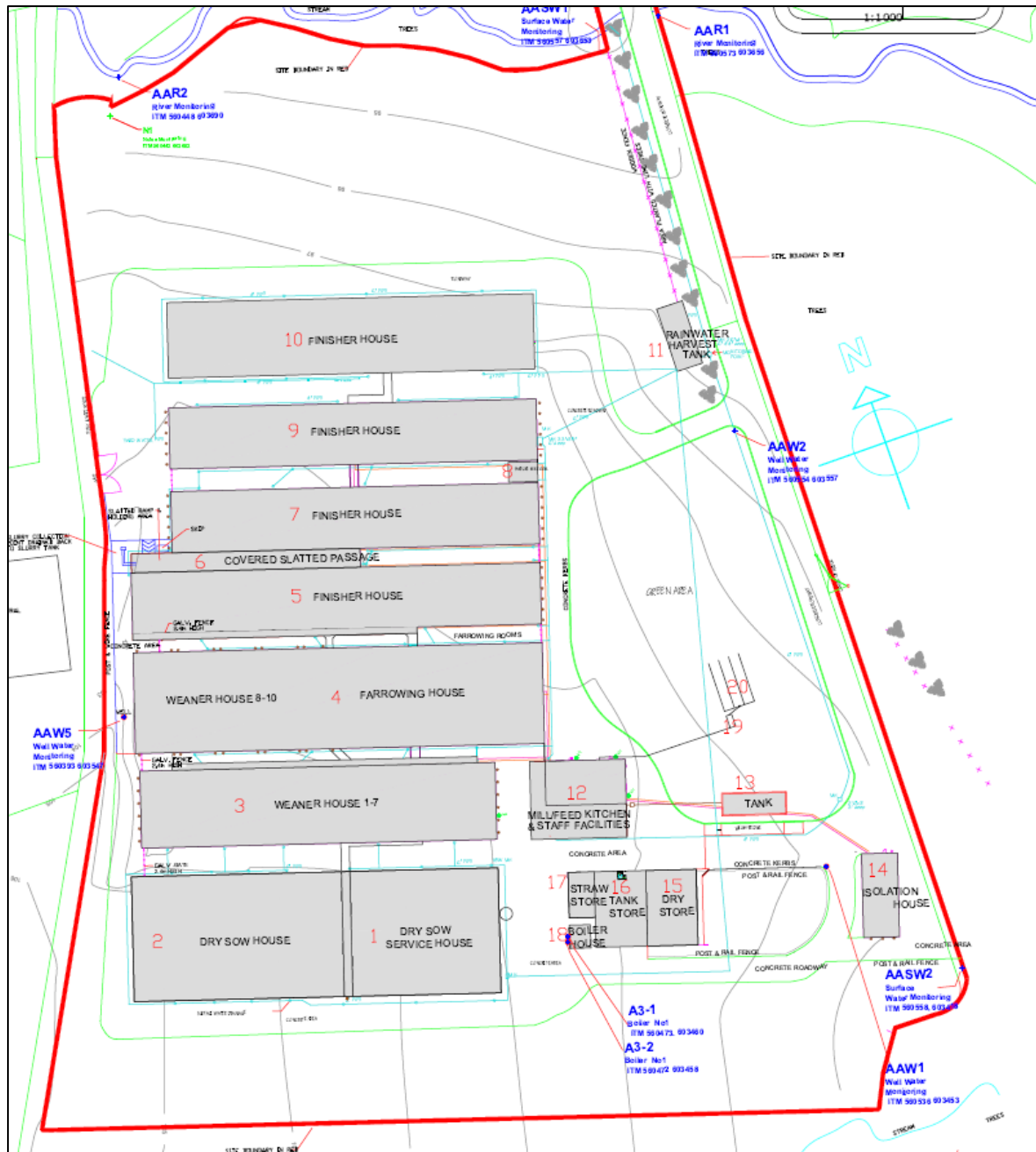


FIGURE 9. DRAWINGS OF ANNAKISHA PIG FARM INFRASTRUCTURE, LAYERS REMOVED TO HIGHLIGHT SURFACE WATER, POTABLE WATER AND STORM WATER POINTS (BLUE). REPRODUCED FROM NRGE DRAWINGS.

1.3.3.3 Foul Drainage

Wastewater treatment at Annakisha pig farm is via an existing septic and percolation area and is separated from the soiled water processing.

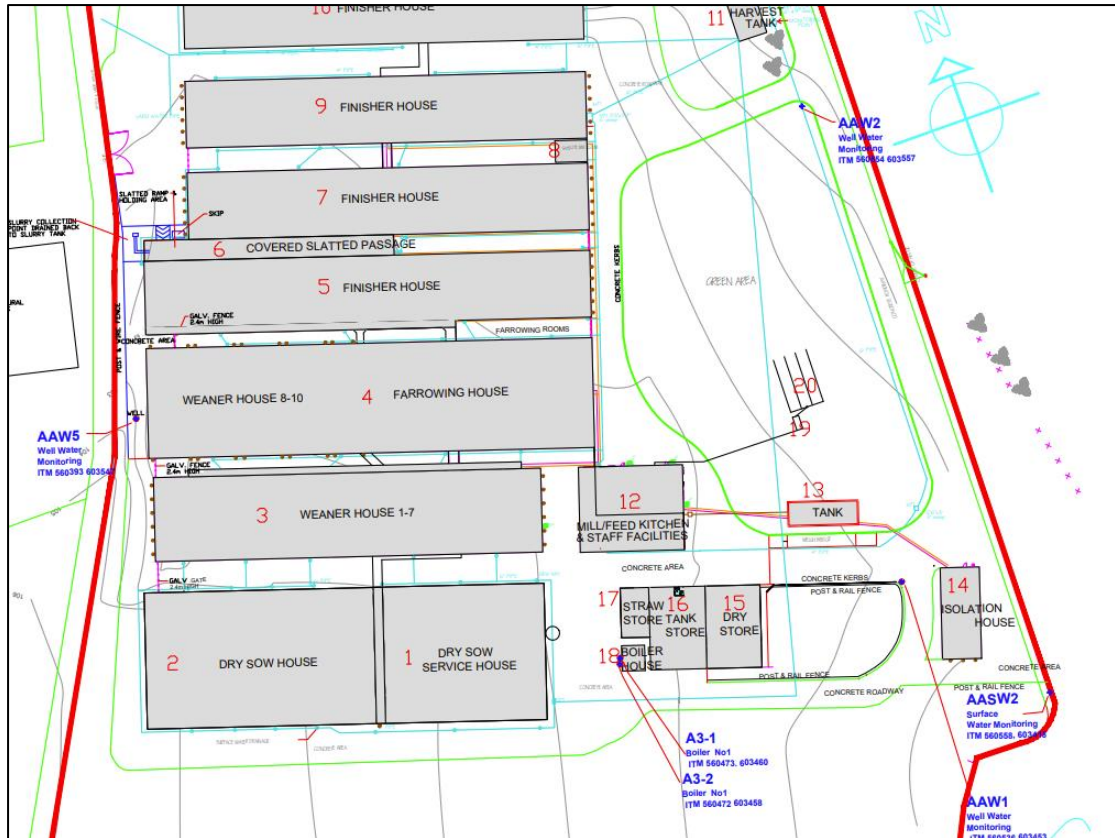


FIGURE 10. NUMBERS 19 AND 20 INDICATE THE SEPTIC TANK AND PERCOLATION AREA (NRGE, 2021).

Soiled water is produced in the following areas/from the following processes:

- Wash water from the mixing room.
- Power washing.

This soiled water is stored in the pig slurry tanks. Pig manure is not spread on the site but is delivered to customer farms. With a predicted 11,000 m³ total annual production of pig manure based on stocking densities and average weekly manure produced.

2 LEGISLATIVE AND POLICY CONTEXT

2.1 Legislative Background

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (2009/147/EC) seeks to protect birds of special importance by the designation of Special Protected Areas (SPAs). The Habitats Directive has been transposed into Irish law through the EC (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011). It is the responsibility of each member state to designate SPAs and SACs, both of which will form part of Natura 2000, a network of protected sites throughout the European Community.

SACs and SPAs are collectively known as “Natura 2000” or “European” sites. SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is selected correspond to the Qualifying Interests (QIs) and Special Conservation Interests (SCIs) of the sites; from these the conservation objectives of the site are derived.

An ‘Appropriate Assessment’ (AA) is an assessment required prior to the grant of planning permission to determine whether a plan or project, based on best scientific knowledge, will have an adverse effect on the integrity of a European site, either alone or in combination with other plans and projects. It is required for any plan or project not directly connected with or necessary to the management of a site but likely to have a significant effect on it.

An AA is required under Article 6 of the Habitats Directive where a project or plan may give rise to significant effects upon a Natura 2000 site. Paragraph 3 states that:

“6(3) Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site, in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.”

2.1.1 Legislative Context

The obligations in relation to Appropriate Assessment have been implemented in Ireland under Part XAB of the Planning and Development Act 2000, as amended (“the 2000 Act”), and in particular Section 177T and Section 177V thereof in relation to Natura Impact Statements and Appropriate Assessment. The relevant provisions of Section 177T and 177V are set out below:

“177T.— (1) In this Part— (a) A Natura impact report means a statement for the purposes of Article 6 of the Habitats Directive, of the implications of a Land use plan,

on its own or in combination with other plans or projects, for one or more than one European site, in view of the conservation objectives of the site or sites.

(b) A Natura impact statement means a statement, for the purposes of Article 6 of the Habitats Directive, of the implications of a proposed development, on its own or in combination with other plans or projects, for one or more than one European site, in view of the conservation objectives of the site or sites.

(2) Without prejudice to the generality of subsection (1), a Natura impact report or a Natura impact statement, as the case may be, shall include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for one or more than one European site in view of the conservation objectives of the site or sites.”

(3) ...

(4) The applicant for consent for proposed development may, or if directed in accordance with subsection (5) by a competent authority, shall furnish a Natura impact statement to the competent authority in relation to the proposed development.

(5) At any time following an application for consent for proposed development a competent authority may give a notice in writing to the applicant concerned, directing him or her to furnish a Natura impact statement.

(6) ...

(7) (a) Without prejudice to subsection (1) a Natura impact report or a Natura impact statement shall include all information prescribed by regulations under section 177AD .

(b) Where appropriate, a Natura impact report or a Natura impact statement shall include such other information or data as the competent authority considers necessary to enable it to ascertain if the draft Land use plan or proposed development will not affect the integrity of the site.”

“177V.— *(1) An appropriate assessment carried out under this Part shall include a determination by the competent authority under Article 6.3 of the Habitats Directive as to whether or not a draft Land use plan or proposed development would adversely affect the integrity of a European site and an appropriate assessment shall be carried out by the competent authority, in each case where it has made a determination under section 177U(4) that an appropriate assessment is required, before—*

(a) the draft Land use plan is made including, where appropriate, before a decision on appeal in relation to a draft strategic development zone is made, or

(b) consent is given for the proposed development.

(2) In carrying out an appropriate assessment under subsection (1) the competent authority shall take into account each of the following matters:

(a) the Natura impact report or Natura impact statement, as appropriate;

(b) any supplemental information furnished in relation to any such report or statement;

(c) if appropriate, any additional information sought by the authority and furnished by the applicant in relation to a Natura impact statement;

(d) any additional information furnished to the competent authority at its request in relation to a Natura impact report;

(e) any information or advice obtained by the competent authority;

(f) if appropriate, any written submissions or observations made to the competent authority in relation to the application for consent for proposed development;

(g) any other relevant information.

(3) Notwithstanding any other provision of this Act, or, as appropriate, the Act of 2001, or the Roads Acts 1993 to 2007 and save as otherwise provided for in sections 177X, 177Y, 177AB and 177AC, a competent authority shall make a Land use plan or give consent for proposed development only after having determined that the Land use plan or proposed development shall not adversely affect the integrity of a European site.

(4) Subject to the other provisions of this Act, consent for proposed development may be given in relation to a proposed development where a competent authority has made modifications or attached conditions to the consent where the authority is satisfied to do so having determined that the proposed development would not adversely affect the integrity of the European site if it is carried out in accordance with the consent and the modifications or conditions attaching thereto.”

2.1.2 Agriculture Specific Legislation

Ireland has legislation in place to regulate intensive pig farming. The primary legislation that governs intensive pig farming in Ireland is the European Union (Good Agricultural Practice for the Protection of Waters) Regulations 2017). These regulations apply to all forms of agricultural activity, including pig farming, and aim to protect water quality by regulating the use of fertilizers, manures, and other substances.

The Animal Health and Welfare Act 2013 provides for the welfare of animals, including pigs, and sets out standards for their care and treatment. The Welfare of Farmed Animals (Amendment) Regulations 2010 also provides for the welfare of pigs, including the provision of adequate space, food, and water.

The EPA also regulates intensive pig farming in Ireland. The EPA issues licenses for pig farms and monitors compliance with environmental regulations.

In Ireland, the use of slurry is regulated by several pieces of legislation, including:

- The European Union (Good Agricultural Practice for Protection of Waters) S.I. 113, 2022 - These regulations set out the requirements for the storage, handling, and spreading of slurry and other fertilizers to protect water quality.
- The Nitrates Action Programme Regulations 2022 - These regulations implement the requirements of the EU Nitrates Directive and set out measures to protect water quality by controlling the use of fertilizers, including slurry.
- The Agricultural and Rural Development Act 2021 - This act provides for the establishment of a National Land Use Planning and Management Advisory Council to advise on sustainable land use and development, including the management of slurry.

- The Water Services (Amendment) Act 2021 - This act includes provisions relating to the management and disposal of agricultural waste, including slurry, to protect water quality and public health.

2.2 Policy Context

2.2.1 Cork County Development Plan

Policies and objectives of the Cork County Development Plan 2022 – 2028 that are of relevance to this Screening Report are outlined below.

The Cork County Development Plan is a planning document that sets out policies and objectives for the future development of the county. The plan includes policies and objectives that are relevant to intensive agriculture, including:

- **Sustainable Agriculture:** The plan recognizes the importance of agriculture to the economy of the county and promotes sustainable agricultural practices. The plan encourages the use of best practices in the management of intensive agricultural activities, including the use of modern technologies, efficient water management, and the protection of natural resources. For example, objective EC: 8-15 Agriculture and Farm Diversification.
- **Protection of Water Resources:** The plan seeks to protect water resources from the adverse impacts of agricultural activities, including intensive farming. It includes policies and objectives aimed at reducing the risk of pollution from agricultural sources, including the management of slurry and other fertilizers. For example, objective WM 11-2: Surface Water Protection.
- **Rural Development:** The plan recognizes the important role of agriculture in rural development and seeks to support sustainable rural communities. It includes policies and objectives aimed at promoting sustainable rural development and diversification of rural economies, including the development of rural tourism and other non-agricultural activities. For example, objective CS 2-4: Greater Cork Ring Strategic Planning Area.
- **Land Use Planning:** The plan promotes the sustainable use of land, including the management of intensive agricultural activities. It includes policies and objectives aimed at promoting sustainable land use, including the protection of valuable farmland and the preservation of important ecological and cultural landscapes. Core Strategy - Integrating Land Use and Transport Planning.
- **Climate Action:** The plan acknowledges the role of agriculture in contributing to greenhouse gas emissions and seeks to promote sustainable agriculture practices that reduce emissions. It includes policies and objectives aimed at promoting renewable energy use, reducing emissions from fertilizers and livestock, and promoting the uptake of agroforestry and other sustainable land use practices. For example, objective WM 11-6: Protection from Agricultural Pollution.
- **Objective RP 5-13: Land Uses within the County Metropolitan Greenbelt** seeks to reserve Metropolitan Greenbelt areas for certain uses, among which are agriculture.

Overall, the Cork County Development Plan promotes the sustainable management of intensive agricultural activities, taking into account the environmental, social, and economic impacts of these activities on the county. The plan seeks to balance the need for agricultural production with the need to protect natural resources, support rural development, and promote sustainable land use practices.

The Cork County Development Plan also outlines the importance of Biodiversity Action Plans.

County Development Plan Objective BE 15-1: Support and comply with national biodiversity protection policies.

- Support and comply with the objectives of the National Biodiversity Plan 2017-2021 (and any future National Biodiversity Plan which may be adopted during the period of this Plan) as appropriate,
- Implement the current County Biodiversity Action Plan and any future updated Plan;
- Support and comply with biodiversity policy set out in other national and regional policy documents as appropriate.

2.3 Stages of Appropriate Assessment

The AA process is a four-stage process. Each stage requires different considerations, assessments and tests to ultimately arrive at the relevant conclusion for each stage. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required.

The four stages of an AA, can be summarised as follows:

- **Stage 1: Screening.** The Screening for AA considers whether a plan or project is directly connected to or necessary for the management of a European site, or whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a European site in view of its conservation objectives.
- **Stage 2: Natura Impact Statement (NIS).** Where Stage 1 determines that significant effects are likely, uncertain or unknown, the preparation of a NIS is required. The NIS must include a scientific examination of evidence and data to classify potential impacts on any European site(s) in view of their conservation objectives in the absence of mitigation. The NIS will identify appropriate mitigation to remove the potential for likely significant adverse effects on any European site(s). If the competent authority determines that the plan or project would have an adverse effect on the integrity of any European site(s) despite mitigation, it can only grant consent after proceeding through stages 3 and 4.
- **Stage 3: Assessment of alternative solutions.** If the outcome of Stage 2 is negative i.e., adverse impacts to the sites cannot be scientifically ruled out, despite mitigation, the plan or project should proceed to Stage 3 or be abandoned. This stage examines alternative solutions to the proposal.
- **Stage 4: Assessment where no alternative solutions exist and where adverse impacts remain.** The final stage is the main derogation process

examining whether there are imperative reasons of overriding public interest (IROPI) for allowing a plan or project to adversely affect a European site, where no less damaging solution exists.

The Habitats Directive promotes a hierarchy of avoidance, mitigation, and compensatory measures. First the project should aim to avoid any negative effects on European sites by identifying possible effects early in the planning stage and designing the project to avoid such effects. Second, mitigation measures should be applied, if necessary, during the AA process to the point where no adverse impacts on the site(s) remain. If the project is still likely to result in adverse effects, and no further practicable mitigation is possible, a refusal for planning permission may be recommended. In this case, the project will generally only be considered where no alternative solutions are identified and the project is required for IROPI, or, in the case of priority habitats, considerations of health or safety, or beneficial consequences of primary importance for the environment or to other IROPI. Then compensation measures are required for any remaining adverse effects.

2.4 Stage 1: Appropriate Assessment Screening Conclusion

An AA Screening Report was prepared for the Development by Enviroguide Consulting on in April 2023.

The conclusion of the AA Screening Report is as follows:

*“In conclusion, upon the examination, analysis and evaluation of the relevant information and applying the precautionary principle, it is concluded by the authors of this report that the possibility **cannot be excluded** that the Proposed Development will have a significant effect on any of the European sites listed below:*

- *Blackwater River (Cork/Waterford) SAC (002170)”*

The AA Screening Determination carried out by EPA in November 2023 as part of the license review identified a further three European sites to be considered as part of this NIS, namely:

- Kilcolman Bog SPA (004095),
- Ballyhoura Mountains SAC (002036),
- Carrigeenamronety Hill SAC (002037).

As such, this NIS will assess the potential effects of the Development on

- Blackwater River (Cork/Waterford) SAC (002170)
- Kilcolman Bog SPA (004095),
- Ballyhoura Mountains SAC (002036),
- Carrigeenamronety Hill SAC (002037).

This Site is potentially linked to these European sites via hydrological and air pathways (particularly re: emissions to surface water networks) (Figure 11).

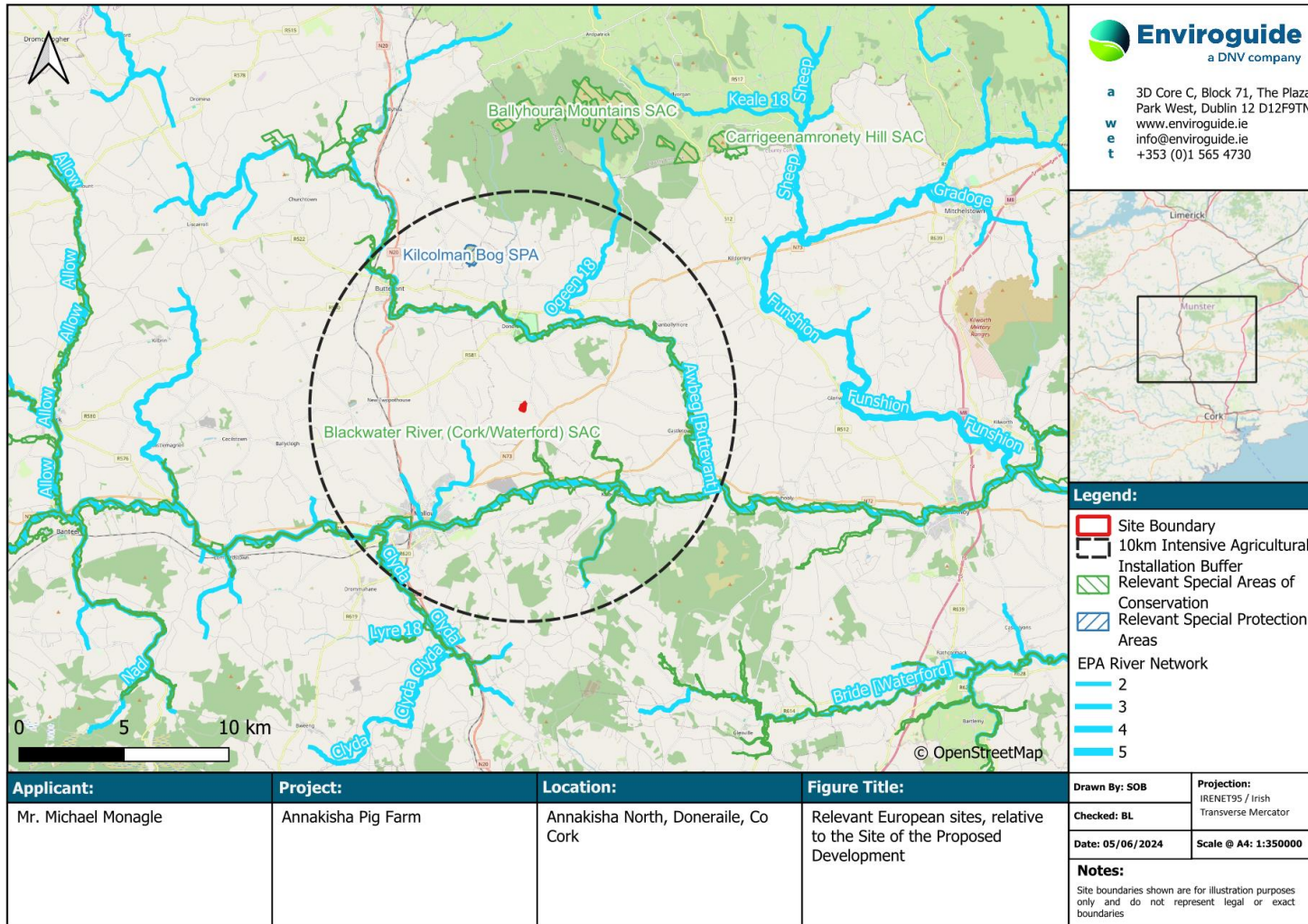


FIGURE 11. RELEVANT EUROPEAN SITES RELATIVE TO THE PROPOSED DEVELOPMENT

3 NIS METHODOLOGY

3.1 Guidance

This NIS has been undertaken in accordance with the following guidance:

- *Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities*. (Department of Environment, Heritage and Local Government, 2010 revision);
- *Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities*. Circular NPW 1/10 & PSSP 2/10;
- *Communication from the Commission on the precautionary principle* (European Commission, 2000);
- *Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC* (European Commission, 2019);
- *Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (European Commission, 2021);
- *Appropriate Assessment Screening for Development Management, OPR Practice Note PN01, Office of the Planning Regulator March 2021*; and
- *Amendments to section 42 of the Planning and Development Act 2000, as amended and associated Planning and Development Regulations 2001. Department of the Environment, Heritage and Local Government. (2021). Circular Letter: EUIPR 01/2021.*

3.2 NIS Steps

This NIS has been prepared following the steps described below:

- Description of the baseline existing environment at the Site of the Development;
- Review and description of available data for the relevant European site(s) potentially affected as identified in the Screening Report (Enviroguide 2023);
- Identification and description of potential effects on the relevant European site(s) and their designated QIs/SCIs;
- Assessment of the likely significance of the effects and/or impacts identified on the relevant QIs/SCIs in view of their Site-Specific Conservation Objectives (SSCOs);
- Description and characterisation of other projects or plans that in combination with the Development have the potential for having significant effects on the relevant QIs/SCIs in view of their SSCOs; and
- Identification of appropriate mitigation measures to remove the likelihood of significant effects on any European site(s) and their QIs/SCIs;
- Exclusion of sites where it can be objectively concluded that there will be no significant effects once mitigation measures are adhered to.

3.3 Desk Study

A desktop study was carried out to collate and review available information, datasets and documentation sources relevant for the completion of the NIS. The desktop study, completed in June 2024, relied on the following sources:

- Information on the network of European sites, relevant boundaries, QIs and conservation objectives, obtained from the National Parks and Wildlife Service (NPWS) at www.npws.ie;
- Information on the status of EU protected habitats and species in Ireland, obtained from the NPWS Article 17 reports;
- Text summaries of the relevant European sites taken from the respective Site Synopses for each site, available at www.npws.ie;
- Information on waterbodies, catchment areas and hydrological connections obtained from the Environmental Protection Agency (EPA) at www.qis.epa.ie;
- Information on bedrock, groundwater, aquifers and their statuses, obtained from Geological Survey Ireland (GSI) at www.gsi.ie;
- Satellite imagery and mapping obtained from various sources and dates including Google, Digital Globe, Bing and Ordnance Survey Ireland; and
- Information on the extent, nature and location of the Development, provided by the applicant and their design team.

A comprehensive list of all the specific documents and information sources consulted in the completion of this report is provided in Section 6 - References.

3.4 Ammonia and Nitrogen Deposition Modelling

In order to determine if the Development could result in impacts to QI habitats associated with the surrounding European sites an ammonia and nitrogen deposition assessment was conducted by Katestone Global.

As part of the EPA guidance on the impact of ammonia and nitrogen on European sites from Intensive Agriculture Installations (IAI) (EPA, 2023), all European sites within 10km of the Proposed Development were assessed for ammonia and nitrogen deposition as a standard approach. European sites located within 10km of the Development are the Blackwater River (Cork/Waterford) SAC (002170) and Kilcolman Bog SPA (004095).

Both the Ballyhoura Mountains SAC (002036) and the Carrigeenamronety Hill SAC (002037) lie outside of this 10km buffer, at 13.1km and 15.0km northeast, respective to the Site of the Proposed Development. However, upon instruction from the EPA in July 2024 ammonia and nitrogen deposition modelling for these sites was carried out and the results are included in this report despite these sites lying outside of the 10km buffer.

Habitat specific critical levels and loads for ammonia and nitrogen deposition were adopted if sensitive or annexed habitats were present at a modelled receptor locations on the Blackwater River SAC and other designated sites within the vicinity name. The

habitats with specific critical levels and loads on the Blackwater River (Cork/Waterford) SAC include:

- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles (91A0) (Critical Level of $1\mu\text{g}/\text{m}^3$ and A Critical Load of 15.3 kg/ha/year).
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno Padion*, *Alnion incanae*, *Salicion albae*) (91E0) (Critical Level of $1\mu\text{g}/\text{m}^3$ and A Critical Load of 10 kg/ha/year).
- **Taxus baccata* woods of the British Isles (91J0) - (Critical Level of $1\mu\text{g}/\text{m}^3$ and A Critical Load of 5 kg/ha/year).

NPWS documentation indicates that the Blackwater SAC contains very limited *Taxus baccata*, with the only location on the SAC mapped in an area of Waterford approximately 50km from the Site. Alluvial forests have been mapped by NPWS south of the Site (at the receptor locations DR16 and DR17). While no old sessile oak woods have been mapped within 10 km of the Site.

Although the NPWS has mapped extensive areas of semi-natural woodland within the Blackwater River SAC, it is not specified if these areas contain habitats that are listed as QIs of the Blackwater River SAC. Conservatively, the following critical loads and levels were applied to all modelling locations with mapped areas of semi-natural woodland:

- A critical level of $1\mu\text{g}/\text{m}^3$ which assumes that all these areas contain the ammonia sensitive habitats.
- A critical load of 10 Kg/ha/year) which assumes that all these areas contain Alluvial Forests.

The assumption that the locations contain alluvial forest habitats is conservative as:

- *Taxus Baccata* habitat is a woodland habitat that is acknowledged by NPWS to only be located at one location, 50 km from the site on the Blackwater River SAC.
- The lowest critical load for the other types of woodlands which are QIs (alluvial forests and old sessile oak woods) on the Blackwater River SAC was adopted.

Higher default levels were adopted for all modelled locations that do not contain nitrogen sensitive species including:

- A critical level of $3.0\mu\text{g}/\text{m}^3$ for ammonia.
- A critical load of 30 kg/ha/year for nitrogen deposition.

It was conservatively assumed that lichens and bryophytes are present in the habitats that make up the Kilcolman Bog SPA. Lichens and bryophytes are highly sensitive to ammonia and nitrogen deposition and conservative criteria were adopted for all modelled locations on the Kilcolman Bog SPA including:

- A critical level of $1.0\mu\text{g}/\text{m}^3$ for ammonia.
- A critical load of 5 kg/ha/year for nitrogen deposition.

A review of the conservation objectives published by NPWS for the Ballyhoura Mountains SAC indicate that the habitats and species listed as conservation objectives with sensitivity to atmospheric ammonia and nitrogen deposition include:

- Northern Atlantic wet heaths with *Erica tetralix* [4010]
- European dry heaths [4030]
- Blanket bogs (* if active bog) [7130]

A review of the conservation objectives published by NPWS for the Carrigeenamronety Hill SAC indicate that the habitats and species listed as conservation objectives with sensitivity to atmospheric ammonia and nitrogen deposition include:

- Killarney Fern (*Trichomanes speciosum*) [1421]
- Dry Heath [4030]

Conservatively, the following critical loads and levels were applied to all DR locations on:

Ballyhoura Mountains SAC:

- A critical level of 1µg/m³ which assumes that all these areas contain the ammonia sensitive habitats.
- A critical load of 5 kg/ha/year) which assumes that all these areas contain Blanket bogs.

Carrigeenamronety Hill SAC:

- A critical level of 1µg/m³ which assumes that all these areas contain the ammonia sensitive habitats
- A critical load of 10 kg/ha/year) which assumes that all these areas contain Killarney Fern (*Trichomanes speciosum*) or Dry Heath.

Modelling was based upon the proposed stock numbers outlined in Table 1.

3.5 Impact Prediction

Potential impacts on the relevant European site(s) identified during the AA Screening are based on information regarding their QIs and/or SCI species, and the attributes and targets relating to their SSCOs. These have been informed by the desk study.

Impact prediction is based on the Source-Pathway-Receptor (S-P-R) model. The following describes the steps of the S-P-R approach taken in this NIS:

- Potential sources of effects were identified based on the Development description and details, including changes to potentially suitable *ex-situ* habitats at the Site (i.e., habitats utilised by SCI bird species outside of their designated SPAs).
- Up-to-date GIS spatial datasets for water catchments as well as any information from relevant site investigations and/or field surveys were used to identify the QIs/ SCIs within the relevant European site(s) that have a notable S-P-R connection to the Development:
 - The catchment data were used to establish or discount potential hydrological connectivity between the Development and any QIs/SCIs.
 - Groundwater and bedrock information used to establish or discount potential hydrogeological connectivity between the Proposed Development and any QIs/SCIs.

- Air and land connectivity assessed based on Development details and proximity to QIs/SCIs.
- Consideration of potential indirect pathways, e.g., impacts to flight paths, *ex-situ* habitats, etc.
- Identification of the specific attributes and targets likely to be affected for those QIs/SCIs linked to the Development via notable S-P-R connections, and a description of the potential impacts.

Where the preceding steps identified any potential for adverse impacts on any QIs/SCIs or their SSCOs for the relevant European site(s), appropriate mitigation measures to eliminate the potential for significant adverse effects are identified in this report.

3.6 Limitations

No limitations were encountered which would prevent robust conclusions being drawn as to the potential impacts of the Development on the relevant European sites.

4 NATURA IMPACT STATEMENT

4.1 Existing Environment

4.1.1 Desk Study Results

4.1.1.1 Hydrology

The Site is located in the Blackwater (Munster) Catchment, which is designated as Hydrometric Area 18. The Site is located within the Blackwater (Munster) Sub-catchment No. 090. The River Blackwater (IE_SW_18B021900) is the main drainage feature in the area surrounding the Site, a tributary of which is located approx. 0.8 km south of the site, flowing west to east, which joins the River Blackwater approx. 3.5 km south of the Site. This River Blackwater has an ecological status of Moderate (Q-Value 3 - 4) (EPA, 2024) and is considered to be At Risk of not achieving its WFD targets, whilst also failing its chemical surface water status. The River Blackwater is classified as a Nutrient Sensitive Area and is designated as a Salmonid Watercourse (EPA, 2024).

4.1.1.2 Hydrogeology

The Site is located within the Rathmore West (IE_SW_G_070) Groundwater Body (GWB) (EPA, 2024). The characteristics of the Rathmore West GWB are summarised below:

- The topography of this body is mainly upland.
- Primary porosity is negligible or non-existent. Therefore, flow occurs along faults, fractures, and joints.
- Diffuse recharge occurs across the GWB through the subsoils and rock outcrops. The low permeability and storativity of the aquifers mean that a high proportion of effective rainfall is rejected and becomes run-off.
- Groundwater is generally unconfined and flow paths are typically short (30 – 300 m).

- Local groundwater flow directions are governed by local topography. Overall, flow is to the south and east.

The groundwater flow direction has been inferred from OSI topographical mapping. The groundwater flow direction is understood to be from the high topography in the northwest, towards the River Blackwater in the south – southeast.

The Site is underlain by a Locally Important Aquifer, which is described as bedrock which is moderately productive only in local zones. To the southeast, the different geological units constitute a Regionally Important Aquifer which is karstified (diffuse). Locally Important Aquifers are bedrock aquifers capable of supplying locally important abstractions (e.g., group water schemes), or ‘good’ yields (100-400 m³/d) (GSI, 2017).

Groundwater vulnerability within the Site is primarily *Rock at or near surface or karst*, ranging to *Extreme*, (Figure 12).

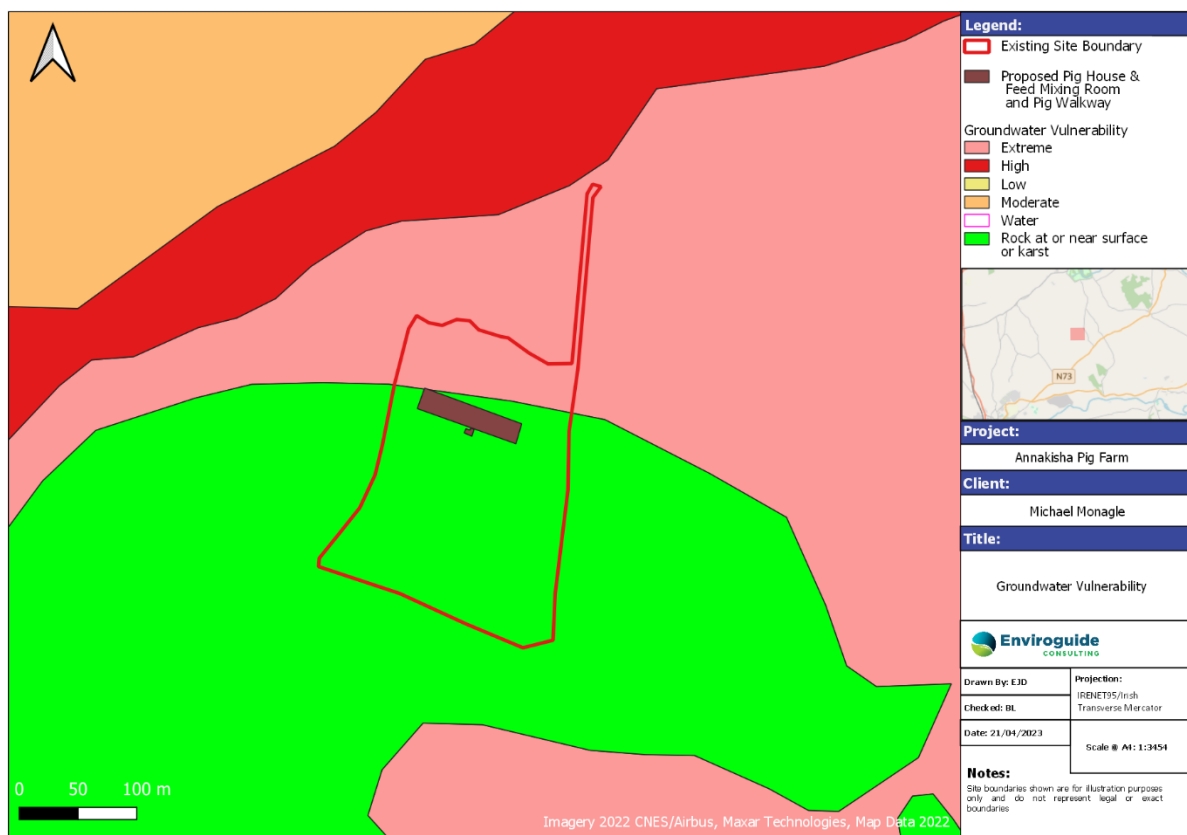


FIGURE 12. GROUNDWATER VULNERABILITY

4.1.1.3 Geology

The National Soils Hydrology Map dataset available on EPA map viewer (EPA, 2024) indicates that the north of the Site sits on well-drained soil (the area corresponding to ‘Extreme’ in Figure 12). Subsoils are till type in the northern portion of the Site, and other deposit type (bedrock at surface) in the mid and southern portions of the Site.

Lithology is described by GSI, (2024) as ‘Till derived from Namurian sandstones and shales’, the Quaternary Sediment being TNSSs.

4.1.1.4 Ammonia and Nitrogen Deposition Modelling Results

The results of the Step 1 assessment indicated that the approaches using the SCAIL-Agriculture model described in Step 2 and Step 3 of the EPA's Ammonia and Nitrogen Assessment Guidance (EPA, 2023) are not applicable. A detailed assessment completed in accordance with Step 4 of EPA's Ammonia and Nitrogen Assessment Guidance is, therefore, required to be completed.

The results of the Step 4 assessment show that, in relation to the 1% threshold identified in Step 4 of EPA's Ammonia and Nitrogen Assessment Guidance, the Process Contribution (PC) due to the pig farm exceeds for ammonia and nitrogen deposition at a number of modelled discrete receptor locations on:

- The Blackwater River (Cork/Waterford) SAC (Receptors – 1 - 80).
- Kilcolman Bog SPA (Receptors – 81 – 86).
- Ballyhoura Mountains SAC (Receptors – 87– 94).

However, the PC due to the pig farm does not exceed the 1% PC threshold defined in Step 4 of EPA's Ammonia and Nitrogen Assessment Guidance for ammonia and nitrogen deposition at any modelled discrete receptor locations on the Carrigeenamronety Hill SAC (Receptors – DR96 – DR97).

The results of the Step 4 assessment indicate that a Step 5 assessment, involving detailed modelling that takes account of in-combination effects, is required for the sensitive locations on the Blackwater River (Cork/Waterford) SAC and Kilcolman Bog SPA within 10km of the Site as well as Ballyhoura Mountains SAC which lies outside of the 10km buffer.

The Step 5 assessment requires a review of background IAls that needed to be included in the in-combination assessment. This review determined there is no requirement for a cumulative assessment of impacts on the Blackwater River (Cork/Waterford) SAC, Kilcolman Bog SPA or Ballyhoura Mountain SAC as no IAl meets the requirements of Step 5 of EPA's Ammonia and Nitrogen Assessment Guidance to be included. Accordingly, the cumulative impact on the Blackwater River (Cork/Waterford) SAC, Kilcolman Bog SPA and Ballyhoura Mountain SAC of all IAls as defined in Step 5 of EPA's Ammonia and Nitrogen Assessment Guidance is equal to the impact of the pig farm in isolation.

The results of the in-combination Step 5 assessment show that at the Blackwater River (Cork/Waterford) SAC, the worst-case cumulative impact due to the pig farm in combination with other IAls that meet the requirements of Step 5 was well below the in-combination assessment level of 20% with the highest modelled results at any of the modelled sensitive locations being:

- 13.1% of the critical level for ammonia
- 12.3% of the critical load for nitrogen deposition.

For the Kilcolman Bog SPA, the worst-case cumulative impact due to the pig farm in combination with other IAls that meet the requirements of Step 5 was below in-

combination assessment level of 20% with the highest modelled results at any of the modelled sensitive locations being:

- 2.1% of the critical level for ammonia.
- 3.9% of the critical load for nitrogen deposition.

At the Ballyhoura Mountains SAC the worst-case cumulative impact due to the pig farm in combination with other IAIs that meet the requirements of Step 5 was well below the in-combination assessment level of 20% with the highest modelled results at any of the modelled sensitive locations being:

- 0.6% of the critical level for ammonia
- 1.1% of the critical load for nitrogen deposition

The results of the assessment indicate that the cumulative impacts of the proposed pig farm with background IAIs are under EPA limits and therefore complies with the Step 5 evaluation criteria at all modelled locations on:

- The Blackwater River (Cork/Waterford) SAC.
- Kilcolman Bog SPA.
- Ballyhoura Mountains SAC.

Although not formally assessed in the above modelling by Katestone Global, aquatic species associated with Blackwater River (Cork/Waterford) SAC (freshwater pearl mussel, white-clawed crayfish, fish species and otter) which are periodically inundated by nutrient enriched flood waters are not anticipated to be significantly impacted by the small inputs associated with deposition. Any inputs from deposition are considered to be slight compared to that resulting from agricultural, forestry and municipal run-off from land. See Appendix 1 for raw data from the modelling assessment. The Special Conservation Interest (SCI) bird species associated with the Kilcolman Bog SPA are also not anticipated to be impacted by the small inputs associated with deposition due to the distance of 6.9km from the Site and the intervening watercourses and agricultural habitats separating the Site from this SPA.

4.1.1.5 Summary of Potential Pathways

4.1.1.5.1 Hydrological Pathways

The Site is located 300m north and upstream of the North Caherduggan waterbody, a tributary of the Blackwater River and part of the Blackwater River (Cork/Waterford) SAC (002170). The Site is 1.5km northwest of this SAC.

Land spreading of pig slurry also presents a potential hydrological pathway to this SAC.

There are no hydrological pathways from the Site of the Development to any other European site, including Kilcolman Bog SPA (004095), Ballyhoura Mountains SAC (002036), and Carrigeenamronety Hill SAC (002037).

4.1.1.5.2 Hydrogeological Pathways

Groundwater flow direction is inferred from topography to be south-southeast, towards the River Blackwater. During groundworks and other construction activities, the ground will be exposed and any potential accidental discharges to ground could potentially

migrate vertically downward to the underlying bedrock aquifer and laterally within the aquifer to the downgradient Blackwater River (Cork/Waterford) SAC (002170).

No other European sites are linked to the Site via hydrogeological means, including Kilcolman Bog SPA (004095), Ballyhoura Mountains SAC (002036), and Carrigeenamronety Hill SAC (002037), due to the intervening distances, the intercepting watercourses separating the Site from these European sites, and the characteristics of the Rathmore West GWB outlined above in section 4.1.1.2.

4.1.1.5.3 Air Pathways

The Construction Phase of the Development could have introduced dust and noise impacts transferable via air pathways, as well as increased lighting and human activity at the Site and in the vicinity of the Site during the Construction and Operational Phases. Additionally, agricultural emissions arising from the Operational Phase of the Development, including the spreading of pig slurry, also present potential impacts.

As part of the EPA guidance on the impact of ammonia and nitrogen on European sites from Intensive Agriculture Installations (IAI) (EPA, 2023), all European sites within 10km of the Proposed Development were assessed for ammonia and nitrogen deposition as a standard approach. European sites located within 10km of the Development are the Blackwater River (Cork/Waterford) SAC (002170) and Kilcolman Bog SPA (004095). The Site is 1.5km north of Blackwater River (Cork/Waterford) SAC (002170) and 6.9km southeast of Kilcolman Bog SPA (004095). Atmospheric ammonia and nitrogen deposition modelling in section 4.1.1.4 above highlighted deposition via air pathway is negligible.

No other European sites are linked to the Site via air or land pathways, including the Ballyhoura Mountains SAC (002036) and the Carrigeenamronety Hill SAC (002037), which lie 13.1km and 15.0km northeast, respectively, to the Site of the Proposed Development.

4.2 Summary Of Relevant European Sites

As per the results of the desk study, the Blackwater River ((Cork/Waterford) SAC was found to be linked to the Proposed Development via notable S-P-R links, namely hydrological and hydrogeological. No other notable pathways to any other European sites were found.

The following descriptions of the relevant habitats and species occurring within the European site(s) considered in this NIS have been extracted from the supporting documents available for the relevant site(s).

4.2.1 Blackwater River (Cork/Waterford) SAC (002170)

The following description of the Site is extracted from the Supporting Documentation (NPWS, 2012) for the site:

“The River Blackwater is one of the largest rivers in Ireland, draining a major part of Co. Cork and five ranges of mountains. In times of heavy rainfall, the levels can fluctuate widely by more than 12 feet on the gauge at Careysville. The peaty nature of the terrain in the upper reaches and of some of the tributaries gives the water a

pronounced dark colour. The site consists of the freshwater stretches of the River Blackwater as far upstream as Ballydesmond, the tidal stretches as far as Youghal Harbour and many tributaries, the larger of which include the Licky, Bride, Flesk, Chimneyfield, Finisk, Araglin, Awbeg (Buttevant), Clyda, Glen, Allow, Dalua, Brogeen, Rathcool, Finnow, Owentaraglin and Awnaskirtaun. The portions of the Blackwater and its tributaries that fall within this SAC flow through the counties of Kerry, Cork, Limerick, Tipperary and Waterford. Nearby towns include Rathmore, Millstreet, Kanturk, Banteer, Mallow, Buttevant, Doneraile, Castletownroche, Fermoy, Ballyduff, Rathcormac, Tallow, Lismore, Cappoquin and Youghal.

River Blackwater is of considerable conservation significance for the occurrence of good examples of habitats and populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive respectively. Furthermore, it is of high conservation value for the populations of bird species that use it. Two Special Protection Areas, designated under the E.U. Birds Directive, are also located within the site - Blackwater Callows and Blackwater Estuary. Additionally, the importance of the site is enhanced by the presence of a suite of uncommon plant species.

The site is also important for the presence of several E.U. Habitats Directive Annex II animal species, including Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*L. fluviatilis*), Twaite Shad (*Alosa fallax fallax*), Freshwater Pearl Mussel (*Margaritifera margaritifera*), Otter (*Lutra lutra*) and Salmon (*Salmo salar*). The Awbeg supports a population of White-clawed Crayfish (*Austropotamobius pallipes*). This threatened species has been recorded from a number of locations and its remains are also frequently found in Otter spraints, particularly in the lower reaches of the river. The freshwater stretches of the Blackwater and Bride Rivers are designated salmonid rivers. The Blackwater is noted for its enormous run of salmon over the years.

The main threats to the site and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, dredging of the upper reaches of the Awbeg, over-grazing within the woodland areas, and invasion by non-native species, for example *Rhododendron* and *Cherry Laurel*.”

4.2.2 Qualifying Interests and Conservation Objectives

The QIs/SCIs and their respective conservation objectives for each of the relevant European site(s) are detailed in Table 2 below.

TABLE 2. QUALIFYING INTERESTS (QIs) / SPECIAL CONSERVATION INTERESTS (SCIs) AND THEIR CONSERVATION OBJECTIVES FOR THE RELEVANT EUROPEAN SITES. THE CONSERVATION STATUS OF EACH QI / SCI WAS SOURCED FROM THE RELEVANT STANDARD DATA FORM(S) (SOURCE: EEA (2024)).

QI / SCI (* = priority habitat)	Conservation Status	Conservation Objective
Blackwater River (Cork/Waterford) SAC (002170)		
1029 Freshwater Pearl Mussel <i>Margaritifera margaritifera</i>	Good	To restore the favourable conservation condition of this QI/SCI in the Blackwater River (Cork/Waterford) SAC
1092 White-clawed Crayfish <i>Austropotamobius pallipes</i>	Average / reduced	To maintain the favourable conservation condition of this QI/SCI in the Blackwater River (Cork/Waterford) SAC

1095 Sea Lamprey <i>Petromyzon marinus</i>	Excellent	To restore the favourable conservation condition of this QI/SCI in the Blackwater River (Cork/Waterford) SAC
1096 Brook Lamprey <i>Lampetra planeri</i>	Excellent	To maintain the favourable conservation condition of this QI/SCI in the Blackwater River (Cork/Waterford) SAC
1099 River Lamprey <i>Lampetra fluviatilis</i>	Good	
1103 Twaite Shad <i>Alosa fallax</i>	Good	To restore the favourable conservation condition of this QI/SCI in the Blackwater River (Cork/Waterford) SAC
1106 Atlantic Salmon <i>Salmo salar</i> (only in fresh water)	Good	To maintain the favourable conservation condition of this QI/SCI in the Blackwater River (Cork/Waterford) SAC
1130 Estuaries	Good	
1140 Mudflats and sandflats not covered by seawater at low tide	Good	
1220 Perennial vegetation of stony banks	Good	
1310 <i>Salicornia</i> and other annuals colonizing mud and sand	Good	
1330 Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>)	Good	To restore the favourable conservation condition of this QI/SCI in the Blackwater River (Cork/Waterford) SAC
1355 Otter <i>Lutra lutra</i>	Good	
1410 Mediterranean salt meadows (<i>Juncetalia 31aritime</i>)	Good	To maintain the favourable conservation condition of this QI/SCI in the Blackwater River (Cork/Waterford) SAC
1421 Killarney Fern <i>Trichomanes speciosum</i>	Not provided	
3260 Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	Excellent	
91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	Average / Reduced	To restore the favourable conservation condition of this QI/SCI in the Blackwater River (Cork/Waterford) SAC
91E0 *Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>)	Excellent	

91J0 *<i>Taxus baccata</i> woods of the British Isles	<i>Not provided</i>	The status of <i>Taxus baccata</i> woods of the British Isles as a qualifying Annex I habitat for the Blackwater River (Cork/Waterford) SAC is currently under review. The outcome of this review will determine whether a site-specific conservation objective is set for this habitat.
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4.3 Impact Prediction

This section follows the S-P-R method as outlined in section 3.5 to identify if and how any of the QIs/SCIs of the relevant European site are linked to the Development. Once the connections have been identified the potential impacts of the Development on the Blackwater River (Cork/Waterford) SAC (002170) in light of its QIs/SCIs and their SSCOs are assessed.

For the purposes of objectivity and clarity, mitigation measures **are not considered in the impact prediction**. This includes all measures that will act limit or eliminate the potential for significant adverse impacts on the relevant European site, including those integrated into the design (e.g., SuDS measures).

4.3.1 Source-Pathway-Receptor Connections

The following elements of the Development were identified and assessed for their potential to cause likely significant effects on European sites.

Construction Phase (*Completed*)

- Uncontrolled releases of silt, sediments and/or other pollutants to air due to earthworks;
- Surface water run-off containing silt, sediments and/or other pollutants (such as inorganic wastes) into nearby waterbodies or surface water network;
- Surface water run-off containing silt, sediments and/or other pollutants into the local groundwater;
- Waste generation during the Construction Phase comprising soils and construction wastes;
- Increased noise, dust and/or vibrations as a result of construction activity;
- Increased dust and air emissions from construction traffic;
- Increased lighting in the vicinity as a result of construction activity; and
- Increased human presence and activity as a result of construction activity.

Operational Phase (*Estimated duration: Indefinite*)

- Surface water drainage from the Site of the Development;
- Foul water from the Development;
- Increased lighting at the Site and in the vicinity emitted from the Development; and
- Atmospheric emissions related to increased total pig numbers.
- Impacts related to increased slurry production and associated storage.
- Air and water pollution due to land spreading of pig manure.

The QIs/SCIs for the relevant European sites are described in Table 3 below. Descriptions are sourced from the relevant Conservation Objectives and supporting documents (NPWS 2012).

Where a potential S-P-R link between the Development and a QI/SCI has been identified, they have been highlighted in green and that QI/SCI will be assessed further in this report.

TABLE 3 .THE QUALIFYING INTERESTS (QIs)/SPECIAL CONSERVATION INTERESTS (SCIs) FOR THE RELEVANT EUROPEAN SITES AND THEIR IDENTIFIED S-P-R CONNECTION TO THE DEVELOPMENT (IF ANY). THOSE QIs/SCIs WHERE THE IDENTIFIED S-P-R CONNECTION DEMANDS FURTHER ASSESSMENT.

QI / SCI (* = priority habitat)	Description	S-P-R Connection
Blackwater River (Cork/Waterford) SAC (002170)		
<p>1029 Freshwater Pearl Mussel <i>Margaritifera margaritifera</i></p>	<p>The freshwater pearl mussel is known from the main Blackwater River, two tributaries (Owentaraglin and Allow) and the Licky River, which discharges to the Upper Blackwater Estuary. 168km encompasses the length of channel from the most upstream records of the freshwater pearl mussel to the most downstream records of live mussels. The SAC has three populations listed on the European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations of 2009 (Government of Ireland, 2009b): Munster Blackwater, Allow (Munster Blackwater) and Licky.</p>	<p>Hydrological & hydrogeological via drainage channels, groundwater and adjacent streams that may transfer pollutants to areas where FWPM is known from.</p>
<p>1092 White - clawed Crayfish <i>Austropotamobius pallipes</i></p>	<p>Within the Blackwater River system, white-clawed crayfish (WCC) is present only on the Awbeg River, which is located 3km north of the Site. The Awbeg flows into the main Blackwater channel approx. 8.6km southeast (and downstream) of the Site. The Awbeg flows through limestone geology. There are other tributaries of the Blackwater with limestone geology but are not known to contain the species. The main Blackwater is considered chemically unsuitable for the crayfish. However, there have been two recent records from other parts of the river system. One was downstream of the confluence of the Awbeg and Blackwater and may simply represent a specimen moving out of the Awbeg. The second was upstream of Mallow and this may represent a new population or an introduction.</p>	<p><u>Land pathway</u> via potential spreading of slurry originating from the Development near known WCC locations in Awbeg River. No other potential pathways were identified.</p>
<p>1095 Sea Lamprey <i>Petromyzon marinus</i></p>	<p>Greater than 75% of main stem length of rivers accessible to sea lamprey from estuary. Known spawning areas in the main River Blackwater channel approx. 2.3 km south of the Site.</p>	<p>Hydrological & hydrogeological via drainage channels, groundwater and adjacent streams that may transfer pollutants to main channel of River Blackwater.</p>
<p>1096 Brook Lamprey <i>Lampetra planeri</i></p>	<p>Brook lamprey live exclusively in freshwater and can be found in both large and small river channels, although they are more typically found in smaller rivers. NBDC records do not record presence of Brook Lamprey within 5km of the Site, however the SAC conservation objectives document (NPWS 2012) suggests juveniles are found along the main River Blackwater channel downstream of the Site.</p>	<p>Hydrological & hydrogeological via drainage channels, groundwater and adjacent streams that may transfer pollutants to main channel of River Blackwater.</p>

QI / SCI (* = priority habitat)	Description	S-P-R Connection
Blackwater River (Cork/Waterford) SAC (002170)		
1099 River Lamprey <i>Lampetra fluviatilis</i>	<p>River lamprey spawn in rivers in mid to late spring in nests called redds, which they evacuate from the bed of gravelly or sandy rivers using their suckers to remove stones. After hatching, larval lamprey drift downstream until they find a suitable muddy or silty part of the riverbed to burrow into.</p> <p>NBDC records do not record presence of River Lamprey within 5km of the Site, however the SAC conservation objectives document (NPWS 2012) suggests juveniles are found along the main River Blackwater channel downstream of the Site.</p>	<p>Hydrological & hydrogeological via drainage channels, groundwater and adjacent streams that may transfer pollutants to main channel of River Blackwater.</p>
1103 Twaite Shad <i>Alosa fallax</i>	<p>Regular breeding has been confirmed in the River Blackwater in recent years. In some catchments, artificial barriers block twaite shads' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. Major weirs on the Blackwater prevent potential exploitation of adult spawning grounds.</p> <p>NBDC records do not record presence of Twaite Shad within 5km of the Site and the NPWS does not have public data on their distribution within the River Blackwater. Out of precautions, it is therefore assumed that this species may be present within the River Blackwater channels near the Site.</p>	<p>Hydrological & hydrogeological via drainage channels, groundwater and adjacent streams that may transfer pollutants to main channel of River Blackwater.</p>
1106 Atlantic Salmon <i>Salmo salar</i> (only in fresh water)	<p>100% of river channels down to second order accessible from estuary. Artificial barriers block salmon's upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. Large weirs on the Blackwater may delay salmon upstream migration in certain water conditions but do not generally prevent access to spawning areas. As such, it is likely that salmon is present in the second order tributaries and the main River Blackwater channel near the Site.</p>	<p>Hydrological & hydrogeological via drainage channels, groundwater and adjacent streams that may transfer pollutants to tributaries of and the main channel of River Blackwater.</p>
1130 Estuaries	<p>This habitat is located at the lower reach of the SAC, removed from the Site by over 50 river km.</p>	<p>Hydrological pathway via the River Blackwater deemed insignificant due to distance.</p>
1140 Mudflats and sandflats not covered by seawater at low tide	<p>This habitat is located within the estuarine habitat described above, and is removed from the Site by over 50 river km.</p>	<p>Hydrological pathway via the River Blackwater deemed insignificant due to distance.</p>
1220 Perennial vegetation of stony banks	<p>The only mapped location of this habitat is recorded at Ferrypoint, near the mouth of the estuary, and is removed from the Site by over 60 river km.</p>	<p>Hydrological pathway via the River Blackwater deemed insignificant due to distance..</p>
1310 <i>Salicornia</i> and other annuals colonizing mud and sand	<p>This habitat is located within the estuarine habitat described above, and is removed from the Site by over 50 river km.</p>	<p>Hydrological pathway via the River Blackwater deemed insignificant due to distance.</p>

QI / SCI (* = priority habitat)	Description	S-P-R Connection
Blackwater River (Cork/Waterford) SAC (002170)		
1330 Atlantic salt meadows (<i>Glauco - Puccinellietalia maritima</i>)	This habitat is located within the estuarine habitat described above, and is removed from the Site by over 50 river km.	Hydrological pathway via the River Blackwater deemed insignificant due to distance.
1355 Otter <i>Lutra lutra</i>	Otter populations recorded in Blackwater River SAC ~3km downstream of Site.	Hydrological & hydrogeological via drainage channels, groundwater and adjacent streams that may transfer pollutants to tributaries of and the main channel of River Blackwater.
1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>)	This habitat is located within the estuarine habitat described above, and is removed from the Site by over 50 river km.	Hydrological pathway via the River Blackwater deemed insignificant due to distance.
1421 Killarney Fern <i>Trichomanes speciosum</i>	This plant species is located along tributaries that the Site has no hydrological connection to. Additionally, the nearest known location is removed from the Site by over 40km and is as such outside of the slurry recipient zone (7km radius from Site).	No potential pathways identified.
3260 Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche - Batrachion</i> vegetation	The full distribution of this habitat and its sub - types in this site are currently unknown, however is thought to occur throughout all stretches of the River Blackwater. The basis of the selection of the SAC for the habitat was the presence of plant species listed in the Interpretation Manual (European Commission, 2007), recorded during the Natural Heritage Area (NHA) survey of the river (internal NPWS files). Further records of these and other aquatic plant species in the Blackwater can be found in Green (2008) and O'Mahony (2009). The dominant floating leaved species appears to be the common and widespread stream water - crowfoot (<i>Ranunculus penicillatus</i> subsp. <i>penicillatus</i>) (Green, 2008, O'Mahony, 2009). No high conservation value subtypes are known to occur in the SAC and further survey is required to determine whether any such are present. Only one rare/threatened vascular plant species is known to occur in the SAC, the protected opposite - leaved pondweed (<i>Groenlandia densa</i>), which is abundant in the tidal stretches around Cappoquin (Green, 2008). Cappoquin is located approx. 50 river km downstream of the Site.	Hydrological & hydrogeological via drainage channels, groundwater and adjacent streams that may transfer pollutants to tributaries of and the main channel of River Blackwater.
91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	This is a terrestrial habitat, with the nearest mapped location removed from the Site by over 7 km.	No pathways between the Site and this QI/SCI identified. Atmospheric Ammonia and Nitrogen deposition modelling in section 4.1.1.4 highlighted deposition via air pathway is negligible.

QI / SCI (* = priority habitat)	Description	S-P-R Connection
Blackwater River (Cork/Waterford) SAC (002170)		
91E0 *Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno - Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>)	Nearest location within 10km of the Site. These habitats rely on periodic flooding and as such may be within reach of any discharges made to the freshwater environment from the Site.	Hydrological & hydrogeological via drainage channels, groundwater and adjacent streams that may transfer pollutants to tributaries of and the main channel of River Blackwater. Air pathway is negligible as outlined in section 4.1.1.4.
91J0 *<i>Taxus baccata</i> woods of the British Isles	The status of <i>Taxus baccata</i> woods of the British Isles as a qualifying Annex I habitat for the Blackwater River (Cork/Waterford) SAC is currently under review. However, as a terrestrial habitat with no known locations within a 10 km distance from the Site, it is unlikely to be within the ZOI of the Development.	No pathways between the Site and this QI/SCI identified. Atmospheric Ammonia and Nitrogen deposition modelling in section 4.1.1.4 highlighted deposition via air pathway is negligible.

4.3.2 Potential impacts of the Proposed Development on Key Habitats and Species

Table 4 below outlines the attributes and targets associated with the site-specific conservation objectives (SSCOs) for the relevant QIs/SCIs as identified in the preceding section. The potential significant effects of the Development on these attributes and targets are also assessed. The assessment outlined below does not consider mitigation measures that will be implemented as part of the Development, but the nature of mitigation that will be required to eliminate the potential for significant adverse impacts is identified in the table, if any.

TABLE 4. ASSESSMENT OF THE POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT ON SITE SPECIFIC CONSERVATION OBJECTIVES. THOSE ATTRIBUTES WHICH ARE AT RISK OF ADVERSE IMPACTS ARE HIGHLIGHTED IN GREEN.

Attribute	Target	Assessment of likely significant effects	Mitigation Requirement
Blackwater River (Cork/Waterford) SAC (002170)			
1029 Freshwater Pearl Mussel <i>Margaritifera margaritifera</i>			
<i>Conservation objective:</i> To restore the favourable conservation condition of this QI/SCI in the Blackwater River (Cork/Waterford) SAC.			
Distribution	Maintain at 161km. (see map 8 in NPWS 2012)	<p>The only attribute unlikely to be impacted by the Development is the flow regime, as no abstraction from or works in the River Blackwater has been proposed. All other attributes and targets listed for this QI are dependent on maintaining good water quality and avoiding siltation and sediment impacts of the benthos.</p> <p>Construction Phase activities may have potentially released silt/sediment and agricultural waste into drainage channels, groundwater and adjacent streams which can reach the Freshwater Pearl Mussel in the Blackwater River SAC.</p> <p>Operationally, slurry spreading on land, and improper slurry storage/leak or spill, can lead to contamination of water courses such as the Blackwater River. The impact of pig slurry on FWPM depends on several factors, including the concentration of nutrients in the slurry, the volume of slurry released, and the distance between the pig farm or slurry spread location, and the downstream site where the mussels are located.</p> <p>High levels of nutrients in the slurry can lead to the growth of algae and other aquatic plants, which can reduce the amount of dissolved oxygen in the water. This can suffocate FWPM and other aquatic organisms, such as their host species (salmonids) that rely on oxygen to survive. Additionally, excessive nutrients can cause eutrophication, a process in which excess nutrients lead to the proliferation of harmful algal blooms, which can further harm the mussels by producing harmful chemicals and/or overtaking suitable habitat.</p> <p>Due to the increase in roof area from the new building, the volume of stormwater has increased. The storm water is piped</p>	<p>Construction Phase mitigation measures to protect surface waters were implemented as per the NIS prepared for the planning application of the new building (Hague 2014). It is considered here that the identified measures were sufficient in preventing significant impacts on this QI.</p> <p>Operational Phase:</p> <p>Mitigation required to ensure no negative impacts on water quality as a result of the normal operation of the Development occurs.</p> <ul style="list-style-type: none"> • Mitigation 1: Slurry management (section 5.4.3.1) • Mitigation 2: Slurry Spreading Practices (section 5.4.3.2)
Population size	Restore to 35,000 adult Mussels		
Population structure: recruitment	Restore to least 20% of population no more than 65mm in length; and at least 5% of population no more than 30mm in length		
Population structure: adult mortality	No more than 5% decline from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution		
Habitat extent	Restore suitable habitat in more than 35km (see map 8 in NPWS 2012) and any additional stretches necessary for salmonid spawning		
Water quality: Macroinvertebrate and phytobenthos (diatoms)	Restore water quality- macroinvertebrates: EQR greater than 0.90; phytobenthos: EQR greater than 0.93		
Substratum quality: filamentous algae (macroalgae), macrophytes (rooted higher plants)	Restore substratum quality- filamentous algae: absent or trace (<5%); macrophytes: absent or trace (<5%)		

Attribute	Target	Assessment of likely significant effects	Mitigation Requirement
Substratum quality: sediment	Restore substratum quality- stable cobble and gravel substrate with very little fine material; no artificially elevated levels of fine sediment	into a tank for use in powerwashing across the farm, prior to discharge overland or via drainage into the stream along the northern boundary of the site. The wash water entering the drainage and small streams adjacent to the Site may contain pollutants such as excess nutrients and silts/sediments that could reach the FWPM within the River Blackwater.	
Substratum quality: oxygen availability	Restore to no more than 20% decline from water column to 5cm depth in substrate		
Hydrological regime: flow variability	Restore appropriate hydrological regimes		
Host fish	Maintain sufficient juvenile salmonids to host glochidial larvae		
<p>1092 White-clawed Crayfish <i>Austropotamobius pallipes</i> <u>Conservation Objective:</u> To maintain the favourable conservation condition of this QI/SCI in the Blackwater River (Cork/Waterford) SAC.</p>			
Distribution	No reduction from baseline (see map 9 in NPWS 2012).	Similar to the FWPM, the attributes and targets of WCC within the SAC are largely dependent on maintaining good water quality. The main pathway of potential impacts on known populations of WCC within the SAC is via the spreading of slurry, as WCC is not known from any downstream or otherwise hydrologically connected locations from the Site. As such, the main likelihood of impacts comes from improper slurry spreading adjacent or near to the Awbeg river. Excess nutrients in the river may lead to deterioration of water quality, and alteration of habitats and their heterogeneity by promoting algal growth and eutrophication. This in turn can affect the WCC's distribution and population structures. Oxygen depletion from excessive algal growth may also lead to displacement and/or mortality of this QI species.	Construction Phase mitigation measures to protect surface waters were implemented as per the NIS prepared for the planning application of the new building (Hague 2014). It is considered here that the identified measures were sufficient in preventing significant impacts on this QI. <u>Operational Phase:</u>
Population structure: recruitment	Juveniles and/or females with eggs in at least 50% of positive samples		
Negative indicator species	No alien crayfish species		
Disease	No instances of disease		

Attribute	Target	Assessment of likely significant effects	Mitigation Requirement
Water quality	At least Q3-4 at all sites sampled by EPA		<p>Mitigation required to ensure no negative impacts on water quality as a result of slurry spreading by clients occurs.</p> <ul style="list-style-type: none"> Mitigation 2: Slurry Spreading Practices (section 5.4.3.2)
Habitat quality: heterogeneity	No decline in heterogeneity or habitat quality		
<p>1095 Sea Lamprey <i>Petromyzon marinus</i> <u>Conservation Objective:</u> To restore the favourable conservation condition of this QI/SCI in the Blackwater River (Cork/Waterford) SAC.</p>			
Distribution: extent of anadromy	Greater than 75% of main stem length of rivers accessible from estuary (See map 10 in NPWS 2012 for recorded distribution).	<p>Water quality impacts may affect the population structure of this QI species by reducing oxygen levels in the water, causing displacement via eutrophication and subsequent habitat loss and/or alteration, particularly of spawning areas that require clean gravels.</p> <p>As this QI and its spawning and juvenile locations are known from the main channel of the River Blackwater near the Site, it may be impacted by potential mismanagement of slurry at the Site, improper slurry spreading practices near water courses, and increased air emissions leading to increased occurrence of acid rain over water courses. For further details on how pig slurry can impact on water quality and aquatic habitats, see earlier section on FWPM.</p>	<p>Construction Phase mitigation measures to protect surface waters were implemented as per the NIS prepared for the planning application of the new building (Hague 2014). It is considered here that the identified measures were sufficient in preventing significant impacts on this QI.</p> <p>Operational Phase: Mitigation required to ensure no negative impacts on water quality as a result of the normal operation of the Development occurs.</p> <ul style="list-style-type: none"> Mitigation 1: Slurry management (section 5.4.3.1) Mitigation 2: Slurry Spreading Practices (section 5.4.3.2)
Population structure of juveniles	At least three age/size groups present		
Juvenile density in fine sediment	Juvenile density at least 1/m ²		
Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds (See map 10 in NPWS 2012 for recorded locations.)		
Availability of juvenile habitat	More than 50% of sample sites positive		

Attribute	Target	Assessment of likely significant effects	Mitigation Requirement
<p>1096 Brook Lamprey <i>Lampetra planeri</i> and 1099 River Lamprey <i>Lampetra fluviatilis</i> <i>Conservation Objective:</i> To maintain the favourable conservation condition of these QIs/SCIs in the Blackwater River (Cork/Waterford) SAC</p>			
Distribution	Access to all water courses down to first order streams	<p>Water quality impacts may affect the population structure of this QI species by reducing oxygen levels in the water, causing displacement via eutrophication and subsequent habitat loss and/or alteration, particularly of spawning areas that require sandy or gravelly sediments.</p> <p>As these QIs and their spawning and juvenile locations are known from the main channel of the River Blackwater near the Site, it may be impacted by potential mismanagement of slurry at the Site and improper slurry spreading practices near water courses.. For further details on how pig slurry can impact on water quality and aquatic habitats, see earlier section on FWPM.</p>	<p>Construction Phase mitigation measures to protect surface waters were implemented as per the NIS prepared for the planning application of the new building (Hague 2014). It is considered here that the identified measures were sufficient in preventing significant impacts on this QI.</p> <p>Operational Phase: Mitigation required to ensure no negative impacts on water quality as a result of the normal operation of the Development occurs.</p> <ul style="list-style-type: none"> Mitigation 1: Slurry management (section 5.4.3.1). Mitigation 2: Slurry Spreading Practices (section 5.4.3.2).
Population structure of juveniles	At least three age/size groups of brook/river lamprey present		
Juvenile density in fine sediment	Mean catchment juvenile density of brook/river lamprey at least 2/m ²		
Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds		
Availability of juvenile habitat	More than 50% of sample sites positive (see map 10 in NPWS 2012 for recorded locations)		
<p>1103 Twaite Shad <i>Alosa fallax</i> <i>Conservation Objective:</i> To restore the favourable conservation condition of this QI/SCI in the Blackwater River (Cork/Waterford) SAC.</p>			
Distribution: extent of anadromy	Greater than 75% of main stem length of rivers accessible from estuary	<p>Water quality impacts may affect the population structure of this QI species via alteration of habitats, and cause changes to the target water oxygen levels. Silt or slurry discharges into the river habitats may alter the benthic structures.</p>	<p>Construction Phase mitigation measures to protect surface waters were implemented as per the NIS prepared for the planning application of the new building (Hague 2014). It is</p>
Population structure: age classes	More than one age class present		

Attribute	Target	Assessment of likely significant effects	Mitigation Requirement
Extent and distribution of spawning habitat	No decline in extent and distribution of spawning habitats	As these QIs and their spawning locations are known from the main channel of the River Blackwater near the Site, it may be impacted by potential mismanagement of slurry at the Site and improper slurry spreading practices near water courses. For further details on how pig slurry can impact on water quality and aquatic habitats, see earlier section on FWPM.	<p>considered here that the identified measures were sufficient in preventing significant impacts on this QI.</p> <p>Operational Phase:</p> <p>Mitigation required to ensure no negative impacts on water quality as a result of the normal operation of the Development occurs.</p> <ul style="list-style-type: none"> Mitigation 1: Slurry management (section 5.4.3.1) Mitigation 2: Slurry Spreading Practices (section 5.4.3.2)
Water quality: oxygen levels	No lower than 5mg/l		
Spawning habitat quality: Filamentous algae; macrophytes; sediment	Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plant) growth		
<p>1106 Atlantic Salmon <i>Salmo salar</i> (only in fresh water)</p> <p><u>Conservation Objective:</u> To maintain the favourable conservation condition of this QI/SCI in the Blackwater River (Cork/Waterford) SAC.</p>			
Distribution: extent of anadromy	100% of river channels down to second order accessible from estuary	<p>Water quality impacts may affect the population structure of this QI species by reducing oxygen levels in the water, causing displacement via eutrophication and subsequent habitat loss and/or alteration, particularly of spawning areas that require sandy or gravelly sediments.</p> <p>As these QIs and their spawning and juvenile locations are known from the main channel of the River Blackwater near the Site, it may be impacted by potential mismanagement of slurry at the Site and improper slurry spreading practices near water courses.</p>	<p>Construction Phase mitigation measures to protect surface waters were implemented as per the NIS prepared for the planning application of the new building (Hague 2014). It is considered here that the identified measures were sufficient in preventing significant impacts on this QI.</p> <p>Operational Phase:</p>
Adult spawning fish	Conservation Limit (CL) for each system consistently exceeded.		
Salmon fry abundance	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling		
Out-migrating smolt abundance	No significant decline		

Attribute	Target	Assessment of likely significant effects	Mitigation Requirement
Number and distribution of redds	No decline in number and distribution of spawning redds due to anthropogenic causes	For further details on how pig slurry can impact on water quality and aquatic habitats, see earlier section on FWPM.	<p>Mitigation required to ensure no negative impacts on water quality as a result of the normal operation of the Development occurs.</p> <ul style="list-style-type: none"> Mitigation 1: Slurry management (section 5.4.3.1) Mitigation 2: Slurry Spreading Practices (section 5.4.3.2)
Water quality	At least Q4 at all sites sampled by EPA		
<p>1355 Otter <i>Lutra lutra</i> <u>Conservation Objective:</u> To restore the favourable conservation condition of this QI/SCI in the Blackwater River (Cork/Waterford) SAC</p>			
Distribution	No significant decline	<p>Water quality impacts may lead to displacement of otter due to reductions in prey availability, as well as lead to less suitable riverine habitats for this species.</p> <p>As this QI is known from locations in the main channel of the River Blackwater near the Site, water quality impacts as a result of potential mismanagement of slurry at the Site and improper slurry spreading practices near water courses may have an indirect impact on otter. For further details on how pig slurry can impact on water quality and aquatic habitats, see earlier section on FWPM.</p>	<p>Construction Phase mitigation measures to protect surface waters were implemented as per the NIS prepared for the planning application of the new building (Hague 2014). It is considered here that the identified measures were sufficient in preventing significant impacts on this QI.</p> <p>Operational Phase:</p> <p>Mitigation required to ensure no negative impacts on water quality as a result of the normal operation of the Development occurs.</p> <ul style="list-style-type: none"> Mitigation 1: Slurry management (section 5.4.3.1) Mitigation 2: Slurry Spreading Practices (section 5.4.3.2)
Extent of terrestrial habitat	No significant decline. Area mapped and calculated as 103ha above high water mark (HWM); 1165.7ha along river banks/ around ponds		
Extent of marine habitat	No significant decline. Area mapped and calculated as 647.2ha		
Extent of freshwater (river) habitat	No significant decline. Length mapped and calculated as 599.54km		
Extent of freshwater (lake) habitat	No significant decline. Area mapped and calculated as 25.06ha		
Couching sites and holts	No significant decline.		
Fish biomass available	No significant decline		

Attribute	Target	Assessment of likely significant effects	Mitigation Requirement
Barriers to connectivity	No significant increase		
3260 Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation <u>Conservation Objective:</u> To maintain the favourable conservation condition of this QI/SCI in the Blackwater River (Cork/Waterford) SAC			
Habitat Distribution	No decline, subject to natural processes	<p>Water quality impacts may lead changes in the vegetation composition by excess silt or sediment introductions or via promoting algal growth by excess nutrient inputs. Changes to water oxygen levels may also alter the aquatic flora composition.</p> <p>As the distribution of this QI is relatively unknown within the SAC, as a precaution it is assumed that this habitat type may be present in the vicinity of the Site. Water quality impacts as a result of potential mismanagement of slurry at the Site and improper slurry spreading practices near water courses could undermine the set conservation objectives and their targets for this QI.</p> <p>For further details on how pig slurry can impact on water quality and aquatic habitats, see earlier section on FWPM.</p>	<p>Construction Phase mitigation measures to protect surface waters were implemented as per the NIS prepared for the planning application of the new building (Hague 2014). It is considered here that the identified measures were sufficient in preventing significant impacts on this QI.</p> <p>Operational Phase:</p> <p>Mitigation required to ensure no negative impacts on water quality as a result of the normal operation of the Development occurs.</p> <ul style="list-style-type: none"> Mitigation 1: Slurry management (section 5.4.3.1) Mitigation 2: Slurry Spreading Practices (section 5.4.3.2)
Habitat area	Area stable or increasing, subject to natural processes		
Hydrological regime: river flow	Maintain appropriate hydrological regimes		
Hydrological regime: tidal influence	Maintain natural tidal regime		
Substratum composition: particle size range	The substratum should be dominated by the particle size ranges, appropriate to the habitat sub-type (typically sands, gravels and cobbles)		
Water quality: nutrients	The concentration of nutrients in the water column should be sufficiently low to prevent changes in species composition or habitat condition		
Vegetation composition: typical species	Typical species of the relevant habitat sub-type should be present and in good condition		
Floodplain connectivity: area	The area of active floodplain at and upstream of the habitat should be maintained		
91E0 *Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) <u>Conservation Objective:</u> To restore the favourable conservation condition of this QI/SCI in the Blackwater River (Cork/Waterford) SAC			

Attribute	Target	Assessment of likely significant effects	Mitigation Requirement
Habitat area	Area stable or increasing, subject to natural processes, at least 19.2ha for sites surveyed (see map 7 of NPWS 2012)		
Habitat distribution	No decline.		
Woodland size	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size		
Woodland structure: cover and height	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer	Water quality impacts may lead changes in the vegetation composition by excess silt or sediment introductions or by altering the species composition via excess nutrient inputs that could promote growth of undesirable species over those typical of this habitat type.	Construction Phase mitigation measures to protect surface waters were implemented as per the NIS prepared for the planning application of the new building (Hague 2014). It is considered here that the identified measures were sufficient in preventing significant impacts on this QI.
Woodland structure: community diversity and extent	Maintain diversity and extent of community types	As this QI is known from only approx. 3km downstream of the Site, water quality impacts as a result of potential mismanagement of slurry at the Site and improper slurry spreading practices near water courses could undermine the set conservation objectives and their targets for this QI.	Operational Phase: Mitigation required to ensure no negative impacts on water quality as a result of the normal operation of the Development occurs.
Woodland structure: natural regeneration	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy		
Hydrological regime: flooding depth/height of water table	Appropriate hydrological regime necessary for maintenance of alluvial vegetation	For further details on how pig slurry can impact on water quality, see earlier section on FWPM.	
Woodland structure: dead wood	At least 30m ³ /ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder)		
Woodland structure: veteran trees	No decline		<ul style="list-style-type: none"> Mitigation 1: Slurry management (section 5.4.3.1) Mitigation 2: Slurry Spreading Practices (section 5.4.3.2)

Attribute	Target	Assessment of likely significant effects	Mitigation Requirement
Woodland structure: indicators of local distinctiveness	No decline		
Vegetation composition: native tree cover	No decline. Native tree cover not less than 95%		
Vegetation composition: typical species	A variety of typical native species present, depending on woodland type, including alder (<i>Alnus glutinosa</i>), willows (<i>Salix spp</i>) and, locally, oak (<i>Quercus robur</i>) and ash (<i>Fraxinus excelsior</i>)		
Vegetation composition: negative indicator species	Negative indicator species, particularly non-native invasive species, absent or under control		

4.3.3 In-combination Effects

4.3.3.1 Existing Planning Permissions

A search of planning applications located within a 500m radius of the Site of the Development was conducted using online planning resources such as the National Planning Application Database (NPAD) (MyPlan.ie) and Cork County Council Planning Applications online map (ePlan). Any planning applications listed as granted or decision pending from within the last five years were assessed for their potential to act in-combination with the Proposed Development and cause likely significant effects on the relevant European sites. Long-term developments granted outside of this time period were also considered where applicable.

As outlined in Table 5, only one planning permission has been sought within 500m of the Site in the last 5 years, and consist of retention for a single dwelling.

TABLE 5. GRANTED AND PENDING DEVELOPMENT APPLICATIONS WITHIN 500 M OF THE DEVELOPMENT. LOCATION AND DISTANCE GIVEN IS RELATIVE TO THE DEVELOPMENT.

Planning Reference	Planning Authority	Status	Location
225024	Cork County Council	Condition Permission	Annakisha North, Doneraile, Co. Cork
Development Description			
Permission for retention of (a) dwelling previously granted under Planning Ref. Number 107/79, (b) domestic shed, (c) entrance, (d) boundaries and all associated site works.			
Potential for In-combination effects			
None – small scale, no potential for in-combination effects.			

4.3.3.2 Relevant Policies and Plans

The local policies and plans detailed in section 2.2 were reviewed and considered for possible in-combination effects with the Development. The Cork County Development Plan 2022-2028 has directly addressed the protection of European sites and biodiversity through specific objectives. The above listed plans are not being relied upon to rule out potential significant effects on European sites.

4.4 Avoidance and Mitigation Measures

In the absence of pollution control/water attenuation measures, groundwater and surface water run-off/discharges from the Development may have the potential to impact the water quality of the Blackwater River SAC and its tributaries, and aquatic species within these watercourses, during the Construction and Operational Phases of the Development. The below mitigation measures are recommended to offset this impact.

4.4.1 Summary of Potential Significant Effects

As the Construction Phase of the Development has already been completed, no significant impacts for it were identified. Note that any potentially significant impacts

would have been assessed in the NIS prepared for the planning application (Hague 2014).

Potential significant effects arising from the **Operational Phase** include:

- **Water quality impacts** arising as a result of:
 - Potential improper slurry storage and management at the Site leading to slurry deposition to adjacent drainage ditches and streams which flow into the relevant SAC.
 - Potential pollutants contained in surface and storm water runoff from Site to adjacent drainage ditches and streams which flow into the relevant SAC.
 - Potential improper slurry spreading practices by client farms.

4.4.2 Construction Phase Mitigation

The construction of the Development has been completed, and as such no mitigation measures for the Construction Phase are required.

4.4.3 Operational Phase Mitigation

4.4.3.1 Mitigation 1: Slurry Management

Slurry management measures include:

- Storage tanks for pig manure will be leak-proof, to industry standard, and undergo regular EPA inspection as per the requirements of the farm license. Groundwater testing of the Site has so far resulted in good quality groundwater, suggesting the current methods are adequate, and are to continue as such.
- Manure is stored on site in accordance with S.I. 113, 2022 regulations, ensuring slurry spreading can happen in optimal conditions.
 - Pig manure will not be exported from the pig farm from October 1st to January 12th, as per the Department of Agriculture guidelines.
- Storm water and pig manure will be kept to separate systems.
- Avoid agitation and movement of pig manure within the unit, particularly in unfavourable conditions (high winds).
- Slurry tankers to be clean when entering the Site.

4.4.3.2 Mitigation 2: Slurry Spreading Practices

Slurry spreading practices include:

- Low emission spreading equipment is used when spreading slurry to reduce emissions.
- In relation to chemical loading of the soils, this development is promoting nutrient substitution rather than addition. The organic fertiliser from this farm will satisfy the growth requirements of grassland/other crops. All organic fertiliser from this existing/expanded pig farm will be allocated for use in

accordance with S.I. 113 of 2022, thus avoiding over enrichment of farmland areas with nutrients.

- Customer farmers will also be advised that the application of additional organic fertiliser to farmland should not occur;
 - In the period 1st Oct- 12th January or other such dates as specified in S.I. 113 of 2022.
 - When soils are waterlogged, and/or ground conditions are unsuitable. These are the times of year when the majority of soil structure damage can occur.

4.5 Monitoring

4.5.1 Construction Phase

During the Construction Phase, the following monitoring was carried out by the construction contractor to ensure the implemented mitigation measures as detailed in the NIS (Hague, 2014) were maintained effectively:

- Surface water and groundwater protection measures will be checked weekly to ensure they remain effective, and more often during moderate to heavy rainfall events as appropriate.
- Environmental regulations: Pig farms are subject to environmental regulations under the Environmental Protection Agency (EPA). The construction monitoring team need to ensure that the construction process complies with these regulations, which may include measures to control odours, noise, and waste.

The EPA provide guidance on such processes, for example: *Instruction note for the assessment of odour emissions from Intensive Agriculture pig installations*, EPA, 2022.

4.5.2 Operational Phase

During the Operational Phase, the following monitoring is recommended to ensure the implemented mitigation measures have been effective:

- Storm water outlets will be visually inspected weekly, and a register of inspections maintained on site.
- Quarterly chemical analysis will also take place.
- As part of its Integrated and Pollution Control Licensing, the EPA conducts regular inspections of various metrics at the Site. The Site and its activities are classified as intensive agriculture by the EPA and are assigned the licence no. P0446-01.
- The following are monitored by the EPA on a regular schedule (dependent on scale of operations) as part of this licensing (BAT):
 - Pig housing and manure
 - Siting of pig units
 - Load (soil) minimization
 - Containment of emissions

- Spreading pig manure
- Technologies for recovery and recycling
- Treatment of manure
- Air emissions
- Surface water quality monitoring
- Groundwater monitoring
- Nutrient management plan

5 CONCLUSION

This Natura Impact Statement details the findings of the Stage 2 Appropriate Assessment conducted to further examine the potential direct and indirect impacts of the Development planning application at Annakisha, Doneraile, Co.Cork, on the following European Sites:

- Blackwater River (Cork/Waterford) SAC (002170)
- Kilcolman Bog SPA (004095)
- Ballyhoura Mountains SAC (002036)
- Carrigeenamronety Hill SAC (002037)

The above site was identified by a screening exercise that assessed likely significant effects of a range of impacts that have the potential to arise from the Development. The Appropriate Assessment investigated the potential direct and indirect effects of the works related to the Development, both during construction/infill and operation, on the integrity and qualifying interests of the above European Site, alone and in combination with other plans and projects, taking into account the site's structure, function and conservation objectives.

Where potentially significant effects were identified, a range of mitigation and avoidance measures have been suggested to avoid them. This NIS has concluded that, once the avoidance and mitigation measures are implemented as proposed, the Development will not have an adverse effect on the integrity of the above European site, individually or in combination with other plans and projects. Where applicable, a suite of monitoring surveys has been proposed to ensure the recommended mitigation measures are implemented efficiently.

As a result of the complete, precise, and definitive findings in of this NIS, it has been concluded, beyond reasonable scientific doubt, that the Development will have no significant adverse effects on the QIs, SCIs and on the integrity and extent of Blackwater River (Cork/Waterford) SAC (002170), Kilcolman Bog SPA (004095), Ballyhoura Mountains SAC (002036), and Carrigeenamronety Hill SAC (002037). Accordingly, the Development will not adversely affect the integrity of any relevant European site.

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Appendix 1

TABLE 1: RESULTS OF THE AMMONIA AND NITROGEN DEPOSITION MODELLING (KATESTONE GLOBAL, 2024).
ASTERIX REFERS TO MODELLING LOCATIONS WITHIN SEMI-NATURAL WOODLAND.

DR	Ammonia			Nitrogen Deposition		
	Concentration	Criteria	% of criteria	Rate	Criteria	% of criteria
	µg/m ³	µg/m ³		kg/ha/yr	µg/m ³	
DR1*	0.008	1	0.8%	0.08	10	0.8%
DR2	0.012	3	0.4%	0.11	30	0.4%
DR3*	0.019	1	1.9%	0.18	10	1.8%
DR4	0.019	1	1.9%	0.18	10	1.8%
DR5	0.035	3	1.2%	0.33	30	1.1%
DR6*	0.038	1	3.8%	0.36	10	3.6%
DR7*	0.048	1	4.8%	0.45	10	4.5%
DR8*	0.043	1	4.3%	0.40	10	4.0%
DR9*	0.056	1	5.6%	0.53	10	5.3%
DR10*	0.070	1	7.0%	0.66	10	6.6%
DR11*	0.111	1	11.1%	1.05	10	10.5%
DR12*	0.131	1	13.1%	1.23	10	12.3%
DR13	0.213	3	7.1%	2.01	30	6.7%
DR14	0.269	3	9.0%	2.54	30	8.5%
DR15	0.300	3	10.0%	2.83	30	9.4%
DR16*	0.053	1	5.3%	0.50	15.3	3.3%
DR17*	0.048	1	4.8%	0.45	15.3	3.0%
DR18	0.047	3	1.6%	0.45	30	1.5%
DR19	0.041	3	1.4%	0.39	30	1.3%
DR20*	0.038	1	3.8%	0.36	10	3.6%
DR21*	0.037	1	3.7%	0.35	10	3.5%
DR22	0.051	3	1.7%	0.48	30	1.6%
DR23	0.052	3	1.7%	0.49	30	1.6%
DR24	0.053	3	1.8%	0.50	30	1.7%
DR25*	0.069	1	6.9%	0.65	10	6.5%
DR26*	0.095	1	9.5%	0.89	10	8.9%
DR27	0.040	3	1.3%	0.37	30	1.2%
DR28	0.035	3	1.2%	0.33	30	1.1%
DR29*	0.025	1	2.5%	0.23	10	2.3%
DR30*	0.021	1	2.1%	0.19	10	1.9%
DR31	0.016	3	0.5%	0.15	30	0.5%

DR32	0.012	3	0.4%	0.11	30	0.4%
DR33	0.011	3	0.4%	0.10	30	0.3%
DR34	0.009	3	0.3%	0.08	30	0.3%
DR35	0.009	3	0.3%	0.08	30	0.3%
DR36	0.007	3	0.2%	0.07	30	0.2%
DR37*	0.035	1	3.5%	0.33	10	3.3%
DR38*	0.032	1	3.2%	0.30	10	3.0%
DR39*	0.031	1	3.1%	0.29	10	2.9%
DR40*	0.028	1	2.8%	0.27	10	2.7%
DR41*	0.033	1	3.3%	0.31	10	3.1%
DR42*	0.026	1	2.6%	0.25	10	2.5%
DR43*	0.032	1	3.2%	0.30	10	3.0%
DR44*	0.025	1	2.5%	0.24	10	2.4%
DR45*	0.019	1	1.9%	0.18	10	1.8%
DR46*	0.045	1	4.5%	0.42	10	4.2%
DR47*	0.061	1	6.1%	0.57	10	5.7%
DR48*	0.072	1	7.2%	0.68	10	6.8%
DR49*	0.068	1	6.8%	0.64	10	6.4%
DR50*	0.069	1	6.9%	0.65	10	6.5%
DR51*	0.071	1	7.1%	0.67	10	6.7%
DR52*	0.081	1	8.1%	0.76	10	7.6%
DR53	0.088	3	2.9%	0.83	30	2.8%
DR54	0.104	3	3.5%	0.98	30	3.3%
DR55	0.107	3	3.6%	1.01	30	3.4%
DR56*	0.114	1	11.4%	1.08	30	3.6%
DR57	0.105	3	3.5%	0.99	30	3.3%
DR58*	0.112	1	11.2%	1.05	10	10.5%
DR59*	0.109	1	10.9%	1.03	10	10.3%
DR60*	0.110	1	11.0%	1.04	10	10.4%
DR61*	0.095	1	9.5%	0.90	10	9.0%
DR62*	0.076	1	7.6%	0.72	10	7.2%
DR63*	0.053	1	5.3%	0.50	10	5.0%
DR64*	0.046	1	4.6%	0.44	10	4.4%
DR65*	0.049	1	4.9%	0.46	10	4.6%
DR66*	0.053	1	5.3%	0.50	10	5.0%
DR67*	0.049	1	4.9%	0.46	10	4.6%
DR68*	0.047	1	4.7%	0.44	10	4.4%

DR69*	0.033	1	3.3%	0.31	10	3.1%
DR70*	0.035	1	3.5%	0.33	10	3.3%
DR71*	0.032	1	3.2%	0.30	10	3.0%
DR72*	0.023	1	2.3%	0.22	10	2.2%
DR73*	0.021	1	2.1%	0.20	10	2.0%
DR74*	0.017	1	1.7%	0.16	10	1.6%
DR75*	0.015	1	1.5%	0.14	10	1.4%
DR76*	0.018	1	1.8%	0.17	10	1.7%
DR77	0.019	1	1.9%	0.18	30	0.6%
DR78	0.018	1	1.8%	0.17	30	0.6%
DR79*	0.013	1	1.3%	0.12	10	1.2%
DR80	0.019	1	1.9%	0.18	5	3.6%
DR81	0.019	1	1.9%	0.18	5	3.5%
DR82	0.018	1	1.8%	0.17	5	3.3%
DR83	0.017	1	1.7%	0.16	5	3.3%
DR84	0.020	1	2.0%	0.19	5	3.8%
DR85	0.021	1	2.1%	0.19	5	3.9%
DR86	0.020	1	2.0%	0.18	5	3.7%
DR87	0.004	1	0.4%	0.03	5	0.7%
DR88	0.004	1	0.4%	0.03	5	0.7%
DR89	0.003	1	0.3%	0.03	5	0.6%
DR90	0.004	1	0.4%	0.04	5	0.7%
DR91	0.004	1	0.4%	0.04	5	0.8%
DR92	0.005	1	0.5%	0.05	5	0.9%
DR93	0.005	1	0.5%	0.05	5	1.0%
DR94	0.006	1	0.6%	0.06	5	1.1%
DR95	0.006	1	0.6%	0.06	10	0.6%
DR96	0.004	1	0.4%	0.04	10	0.4%

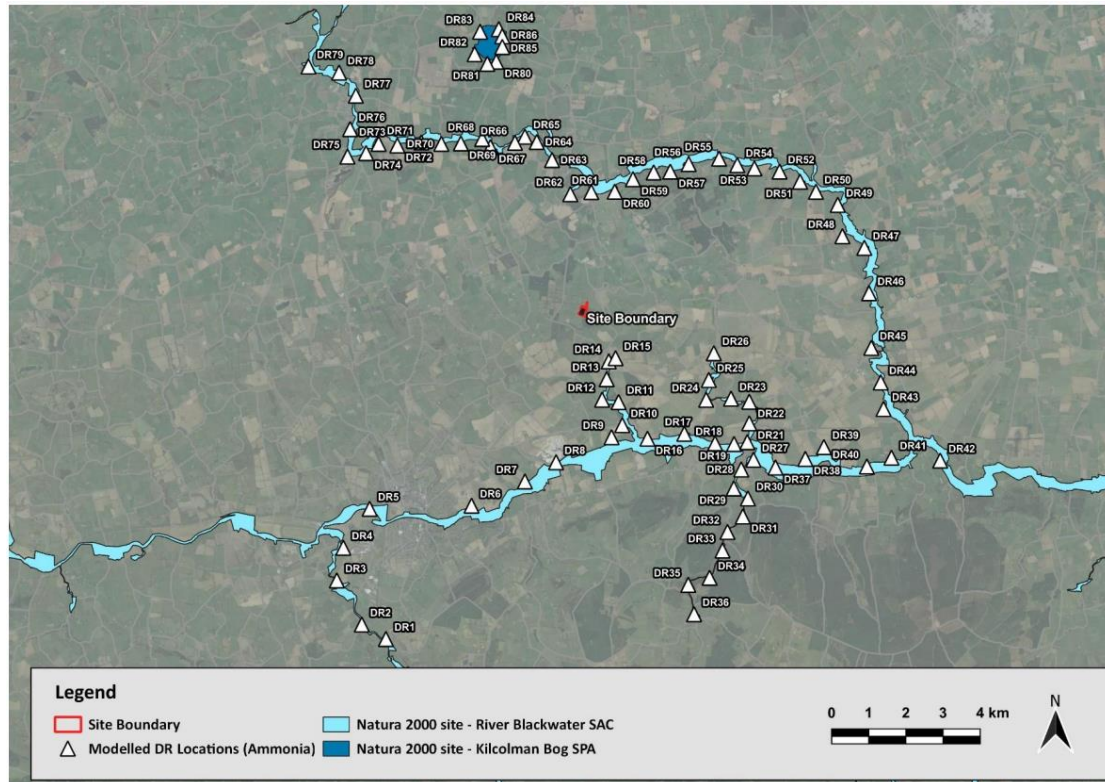


FIGURE 1: MAP OF ALL THE DISCRETE RECEPTOR LOCATIONS IN WHICH AMMONIA AND NITROGEN EMISSIONS WERE MODELLED IN BLACKWATER RIVER (CORK/WATERFORD) SAC AND KILCOLMAN BIG SPA.

TABLE 1. TABLE OF DISCRETE RECEPTOR LOCATIONS COORDINATES FOR THE ADDITIONAL MODELLING OF AMMONIA AND NITROGEN DEPOSITION AT BALLYHOURA MOUNTAINS SAC AND CARRIGEENAMRONETY HILL SAC

Natura 2000 site	Receptor	Location (UTM)	
		km	km
Ballyhoura Mountains SAC	DR87	527.676	5794.488
	DR88	529.506	5794.555
	DR89	530.768	5795.012
	DR90	531.806	5794.756
	DR91	532.353	5794.488
	DR92	533.541	5793.954
	DR93	534.992	5793.625
Carrigeenamronety Hill SAC	DR94	536.003	5793.017
	DR95	537.923	5793.333
	DR96	538.838	5793.287



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