Environmental Impact Assessment Report (EIAR)

Volume 1 Main Statement

Large Scale Residential Development at Kilbride, Arklow, County Wicklow

May 2025

In association with

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1. Introduction and Methodology

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) has been prepared on behalf of our client Certain Assets of Dawnhill and Windhill Limited to accompany a Large-Scale Residential Development (LRD) application to Wicklow County Council for a new residential development on lands at a site on "AAP3 Lands" in Kilbride, Arklow, Co. Wicklow.

This EIAR has been compiled in accordance with all current legislation and best practice guidance. This Chapter describes the methodology by which the Environmental Impact Assessment (EIA) was carried out and the EIAR was completed. The methodology used is broadly consistent across all chapters in order to ensure the EIAR is clear and easy to navigate.

The subject site is located in the area of Kilbride on the northern side of the Avoca River. It is close to the Dublin Road and associated amenities and retail facilities associated with the Blackwater Shopping Centre Area and its surroundings. The overall landholding measures c.75.4 ha and is bounded by the town marsh to the south, M11 to the west, housing at Avondale Crescent/ Murrell Drive and St Joseph's School to the east and the Kilbride Industrial estate and Kilbride Road L-6179 to the north. The site slopes in a broadly north / south direction to the town marsh and Avoca river.

The subject site is located within the administrative area of Wicklow County Council, and is subject to the land use policies and objectives of the Wicklow County Council Development Plan 2023-2029 along with the Arklow and Environs LAP 2018-2024. The subject lands are designated Action Area Plan 3 (AAP3) – Kilbride Lands. The majority of the AAP3 lands are subject to a single zoning – "*MU: Mixed Use"* with the objective *"To provide for mixed use development."* It also states that "*The nature of the mixed use development envisaged for any particular site is set out in the text of the plan."* As a result, and as set out in the AP3 text residential development is *'permitted in principle'* on the MU zoning as are creche uses. The proposed residential development, which will include 666 no. residential units, a creche and public and communal open spaces and retail units are all permitted uses on this MU land use zoning. Therefore, the proposal is considered to be in accordance with the overarching land use zoning on the site as per the County Development Plan.

The area to the south will also deliver a new pedestrian and cyclist bridge across the Marsh, connecting the site to Arklow Town Centre. As set out in the LAP Chapter 10 "*The marsh is the principal wetland habitat in the area, providing an important flood control role and supporting a variety of plant and animal life, in particular reed species and bird life."* Relevant Heritage Objectives relating to this zoning are:

- HT1 which aims "*To maintain the favourable conservation status of all proposed and future Natural Heritage Areas (NHAs) in the plan area in particular the Arklow Marsh and to support environmentally sensitive measures to enhance the understanding and enjoyment of such natural areas."*
- HT3 which aims to "*Protect and enhance the character, setting and environmental quality of natural, architectural and archaeological heritage, and in particular those features of the natural landscape and built structures that contribute to its special interest. The natural, architectural and archaeological heritage of the area shall be protected in accordance with the objectives set out in the Wicklow County Development Plan*"

- HT8 which aims to "*To facilitate the development and enhancement of green infrastructure resources, including access to, connectivity between areas of interest and linkages between green spaces including the coast, where feasible within Arklow and environs settlement boundary (see Map No. 10.1).*"
- HT9 which aims to "*To maintain the conservation value of all proposed and future Natural Heritage Areas (NHAs) and to protect other designated ecological sites in Arklow and Environs.*"

These objectives allow for the enhancement of and access to areas of interest, green space and natural landscape provided they are appropriately protected and sensitively developed. In this regard, a pedestrian bridge over the PNHA is in accordance with the zoning of the site and therefore in accordance with the Development Plan and LAP for the area.

The proposed development is described in the statutory notices as follows:

The development will consist of the demolition of 3 no. structures on site including a 2-storey habitable house (total GFA 207 sq.m) and 2 no. sheds/outbuildings (c.580 sq.m). Closures of 2 no. existing entrances onto the Kilbride Road (L-6179). Construction of a new residential development and local centre comprising: 666 no. units (578 no. semi-detached and terraced housing (100 no. 2 beds, 317 no. 3 beds, 161 no. 4 beds) and 88 no. apartments and duplex apartments (24 no. 1 beds, 51 no. 2 beds and 13 no. 3 beds)). All residential units will have associated private open space facing north/ south/ east/ west. The proposal will also include a local centre (c. 2335 sq.m) comprising a creche (c.1,095sqm) with outdoor play area, 3 no. community/medical units (c.450 sq.m), and 3 no. retail units (c.790sq.m). Building heights within the development will range from one to five storeys.

The development will include streets, pedestrian/cycle links, open spaces/parks (with play areas) and will include amendments to the permitted open spaces and access road granted as part of the Phase 1/Character Area 1a development (WCC Reg. Ref.: 23/756 on the subject lands.

The development will also include a public boardwalk/bridge for pedestrians and cyclists from the development across Arklow Town Marsh and the Avoca River to the Arklow Riverwalk north of Arklow Town Car Park and the Town Centre, with the bridge element (and associated works) across the Avoca River constructed atop the concrete columns (debris traps) permitted as part of the Arklow Flood Relief Scheme (Planning Ref. ABP-310368-21).

All associated site development works, site reprofiling, infrastructural and drainage works, surface water attenuation and natural attenuation areas, connection to public services and utilities (including undergrounding of ESB lines), provision of substations, bin stores, bicycle stores, car and cycle parking at surface and undercroft levels, public lighting, landscaping and planting, public/communal/private open spaces and boundary treatment works. This development will form part of the designated Kilbride Action Area Plan AAP3.

A detailed description of the proposed development is provided in Chapter 3 of this EIAR.

1.2 Legislative Context

Certain public and private projects that are likely to have significant effects on the environment are subject to EIA requirements derived from EIA Directive 85/337/EC (as amended by Council Directive

97/11/EC, Directive 2003/35/EC, Directive 2009/31/EC, Directive 2011/92/EU and Directive 2014/52/EU).

The EIA Directives have been transposed into the Irish planning consent system by way of the Planning & Development Act, 2000 (as amended) (the "Act"), and the Planning & Development Regulations 2001-2024, (as amended) (the "Planning Regulations").

The most recent amending Directive (2014/52/EU) was transposed into Irish law by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296/2018)) on 1st September 2018. The European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 then further amended the Planning and Development Act 2000 (as amended) and the Planning and Development Regulations 2001 (as amended) transposing the amended Directive into the Irish planning code.

Complementary to the legislation is a range of guidelines produced by the EU and government agencies to inform the carrying out of EIA:

- EU Guidance on EIA Screening (DG Environment 2001).
- Guidance on EIA Scoping (DG Environment 2001).
- EIA Review Checklist (DG Environment 2001).
- Guidance of Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Union 2013)
- Environmental Assessments of Plans, Programmes and Projects – Rulings of the Court of Justice of the European Union (European Union 2020)
- Guidelines on Information to be Contained in an Environmental Impact Statement (EPA 2002).
- Study on the Assessment of Indirect & Cumulative Impacts as well as Impact Interaction (DG Environment 2002).
- Environmental Impact Assessment (EIA), Guidance for Consent Authorities Regarding Sub-Threshold Development (DoEHLG 2003).
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (EPA 2003).
- Development Management Guidelines (DoEHLG, 2007).
- Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems -– Key Issues Consultation Paper (Department of Environment, Community and Local Government, 2017).
- Circular letter PL 1/2017 -– Advice on Administrative Provisions in Advance of Transposition (Department of Housing, Planning and Local Government, 2017).
- Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission 2017)
- Environmental Impact Assessment of Projects – Guidance on Screening (European Commission 2017)
- Environmental Impact Assessment of Projects – Guidance on Scoping (European Commission 2017)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018).
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2022)

- Environmental Impact Assessment Screening Practice Note 2021 (Office of the Planning Regulator)

1.3 Legislative Definition of EIA

Article 1(1)(g) of the EIA Directive, defines *"Environmental Impact Assessment"* (EIA) as a *"process"* consisting of:

(i) the preparation of an environmental impact assessment report by the developer, as referred to in Article 5(1) and (2);
(ii) the carrying out of consultations as referred to in Article 6 and, where relevant, Article 7;
(iii) the examination by the competent authority of the information presented in the environmental impact assessment report and any supplementary information provided, where necessary, by the developer in accordance with Article 5(3), and any relevant information received through the consultations under Articles 6 and 7;
(iv) the reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point (iii) and, where appropriate, its own supplementary examination; and
(v) the integration of the competent authority's reasoned conclusion into any of the decisions referred to in Article 8a.'

Article 171A of the Act defines *'environmental impact assessment' as "… a process*

(a) consisting of—
(i) the preparation of an environmental impact assessment report by the applicant in accordance with this Act and regulations made thereunder,
(ii) the carrying out of consultations in accordance with this Act and regulations made thereunder,
(iii) the examination by the planning authority or the Board, as the case may be, of—
(I) the information contained in the environmental impact assessment report,
(II) any supplementary information provided, where necessary, by the applicant in accordance with section 172(1D) and (1E), and
(III) any relevant information received through the consultations carried out pursuant to subparagraph (ii),
(iv) the reasoned conclusion by the planning authority or the Board, as the case may be, on the significant effects on the environment of the proposed development, taking into account the results of the examination carried out pursuant to subparagraph (iii) and, where appropriate, its own supplementary examination, and
(v) the integration of the reasoned conclusion of the planning authority or the Board, as the case may be, into the decision on the proposed development, and
(b) which includes—
(i) an examination, analysis and evaluation, carried out by the planning authority or the Board, as the case may be, in accordance with this Part and regulations made thereunder, that identifies, describes and assesses, in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of the proposed development on the following:
(I) population and human health;
(II) biodiversity, with particular attention to species and habitats protected under the Habitats Directive and the Birds Directive;

(III) land, soil, water, air and climate;
(IV) material assets, cultural heritage and the landscape;
(V) the interaction between the factors mentioned in clauses (I) to (IV), and

(ii) as regards the factors mentioned in subparagraph (i)(I) to (V), such examination, analysis and evaluation of the expected direct and indirect significant effects on the environment derived from the vulnerability of the proposed development to risks of major accidents or disasters, or both major accidents and disasters, that are relevant to that development;

1.4 EIA Screening

Section 176A of the Act defines 'screening for environmental impact assessment' as

".. a determination—

(a) as to whether a proposed development would be likely to have significant effects on the environment, and
(b) if the development would be likely to have such effects, that an environmental impact assessment is required."

Section 172 of the Act states that an EIA shall be carried out in respect of an application for consent for proposed development where either of the following are relevant:

(a) the proposed development would be of a class specified in—
(i) Part 1 of Schedule 5 of the Planning and Development Regulations 2001, and either—
I) such development would equal or exceed, as the case may be, any relevant quantity, area or other limit specified in that Part, or
II) no quantity, area or other limit is specified in that Part in respect of the development concerned,

or

(ii) Part 2 (other than subparagraph (a) of paragraph 2) of Schedule 5 of the Planning and Development Regulations 2001 and either—
I) such development would equal or exceed, as the case may be, any relevant quantity, area or other limit specified in that Part, or
II) no quantity, area or other limit is specified in that Part in respect of the development concerned,

or

(b) (i) the proposed development would be of a class specified in Part 2 of Schedule 5 of the Planning and Development Regulations 2001 but does not equal or exceed, as the case may be, the relevant quantity, area or other limit specified in that Part, and
it is concluded, determined or decided, as the case may be,

(I) by a planning authority, in exercise of the powers conferred on it by this Act or the Planning and Development Regulations 2001 (S.I. No. 600 of 2001),

(II) by the Board, in exercise of the powers conferred on it by this Act or those regulations,

(III) by a local authority in exercise of the powers conferred on it by regulation 120 of those regulations,

(IV) by a State authority, in exercise of the powers conferred on it by regulation 123A of those regulations,

(V) in accordance with section 13A of the Foreshore Act, by the appropriate Minister (within the meaning of that Act), or

(VI) by the Minister for Communications, Climate Action and Environment, in exercise of the powers conferred on him or her by section 8A of the Minerals Development Act 1940,

that the proposed development is likely to have a significant effect on the environment.

The subject site does not fall within any development classes set out in Part 1 of Schedule 5.

The following development classes set out in Part 2 of Schedule 5 are noted:

- 10(b)(i) Construction of more than 500 dwellings
- 10(b)(iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere.
  (In this paragraph, "business district" means a district within a city or town in which the predominant land use is retail or commercial use.)

The gross area of the application site is c. 28.47ha gross (and 24.31ha net), which is above the 10ha threshold for a built-up area.

The proposed development is for 666 no. residential units which is above the 500 no. residential unit threshold.

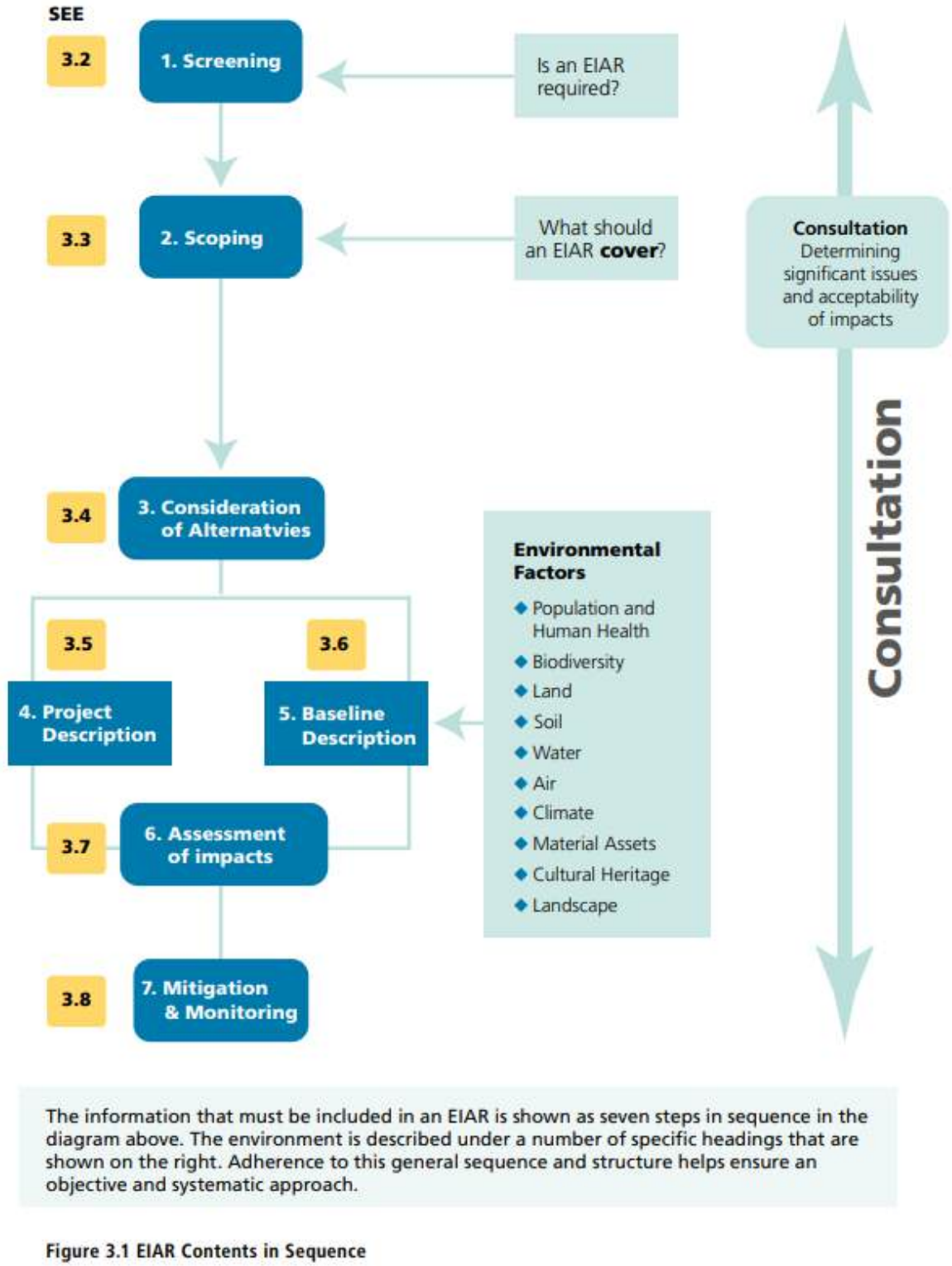
Based on Part 2 of Schedule 5 criteria above in relation to gross site area and construction of over 500 dwellings an EIA is deemed mandatory in respect of the project.

1.5 EIA Scoping

Section 173(2) (a) of the Planning and Development Act 2000 (as amended) provides that a formal request for scoping may be submitted to the planning authority. However, the 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (2022), confirm that this is not mandatory.

The EIAR team carried out a scoping exercise to identify the key issues that may be considered likely to have a significant effect on the environment. In accordance with the EPA Guidelines (2022), those issues that do not meet the threshold of significance have been 'scoped out'. The following issues have been identified in the context of the proposed development:

- Population & Human Health
- Biodiversity
- Lands, Soils & Geology
- Hydrology & Water Services
- Noise & Vibration
- Air & Climate
- Landscape & Visual
- Traffic & Transportation
- Material Assets
- Waste Management
- Cultural Heritage
- Interaction and Cumulative Impacts
- Non-Technical Summary



The information that must be included in an EIAR is shown as seven steps in sequence in the diagram above. The environment is described under a number of specific headings that are shown on the right. Adherence to this general sequence and structure helps ensure an objective and systematic approach.

Figure 3.1 EIAR Contents in Sequence

Figure 1.1: Extract from Guidelines on the Information to be contained in Environmental Impact Assessment Reports, EPA 2022 EIAR Objectives

According to the Environmental Impact Assessment of Projects – Guidance on Screening (European Commission 2017) the EIA process is based on the following four principles:

- *Pursuing Preventative Action*

An assessment of anticipated likely and significant impacts was undertaken during the screening and the considerations of alternatives stages of the EIA process. This involved forming a preliminary opinion with respect to the approximate magnitude and character of the likely environmental impacts. This assessment was based on the knowledge, experience and expertise of the EIA team with reference to EIA guidance material and local information.

- *Maintaining Environmental Focus and Scope*

The EIA process has focussed on those issues where environmental impact is likely to occur and have significant effects.

- *Informing the Decision*

The EIAR has been developed and is presented in such a way as to facilitate the authority decision on the acceptability of the proposed development in the full knowledge of the project's likely significant impacts on the environment, if any.

- *Public & Stakeholder Participation*

Participation is provided through the statutory planning process which allows for public participation and consultation while receiving advice from other key stakeholders and statutory authorities with specific environmental responsibilities.

1.6 EIAR Format & Content

This EIAR is sub divided as follows:

- Environmental Impact Assessment Report
- Appendices to Environmental Impact Assessment Report
- Non-Technical Summary.

The EIAR has been prepared in the Grouped Format as set down in the EPA "Guidelines on Information to be contained in an EIS" (2002) and the 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (2022). In general, the EIAR follows the framework presented in the EPA "Advice Notes on Current Practice in the Preparation of Environmental Impact Statements" (September 2003).

The topics examined in this EIAR are categorised under the environmental factors prescribed under the EIA Directive and Planning Regulations. The responsibility for each of the EIAR chapters is also outlined below:

Table 1.1: Responsibility for each of the EIAR Chapters

Chapter	Title	Consultant
1.	Introduction & Methodology	McGill Planning Ltd.

2.	Alternatives	McGill Planning Ltd.
3.	Description of Development	McGill Planning Ltd.
4.	Population & Human Health	McGill Planning Ltd.
5.	Biodiversity	Altemar Environmental Consultants
6.	Lands, Soils & Geology	Donnachadh O'Brien and Associates Consulting Engineers
7.	Hydrology & Hydrogeology	AWN Consulting Engineers
8.	Noise & Vibration	Traynor Environmental Limited
9.	Air & Climate	Traynor Environmental Limited
10.	Landscape & Visual	McGill Planning Ltd.
11.	Traffic & Transportation	Systra Consulting Engineers
12.	Waste Management	Traynor Environmental Limited
13.	Cultural Heritage - Archaeology	Shanarc Archaeology
14.	Material Assets	Donnachadh O'Brien and Assocaites Consulting Engineers
15.	Interactions	McGill Planning Ltd.
16.	Summary of Mitigations Measure	McGill Planning Ltd.
n/a	Non-Technical Summary	McGill Planning Ltd.

1.7 Methodology

The preparation of this EIAR requires the co-ordination and synthesis of associated yet diverse elements of the overall assessment. To facilitate this process, a schematic structure is proposed in order to provide a coherent documentation of the varied aspects of the environment considered. The grouped format structure of this EIAR is listed below with a brief outline of each specific stage.

Methodology

The specific approach or techniques used to analyse impacts or describe environments. As set out in section 3.7.1 of the EPA Guidelines, the EIAR focuses on:

- Effects that are both likely and significant; and
- Description of effects that are accurate and credible.

It should contain (Annex IV(5) of the Amended Directive):

> *"A description of the likely significant effects of the project on the environment resulting from, inter alia:*
>
> *a) the construction and existence of the project, including, where relevant, demolition works;*
>
> *b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;*
>
> *c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;*
>
> *d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);*
>
> *e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;*

f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;
g) the technologies and the substances used.
The description of the likely significant effects on the [environmental] factors should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project."

The EPA Guidelines advise that "*Effects should be described by reference to the individual environmental factors and their sensitivities. It may be useful to consider such effects in light of the criteria listed in Annex III of the amended Directive*.

a) 'the magnitude and spatial extent of the impact (for example geographical area and size of the population likely to be affected);
b) the nature of the impact;
c) the transboundary nature of the impact;
d) the intensity and complexity of the impact;
e) the probability of the impact;
f) the expected onset, duration, frequency and reversibility of the impact;
g) the cumulation of the impact with the impact of other existing and/or approved projects;
h) the possibility of effectively reducing the impact"

The terminology set out in Table 3.4 of the EPA 2022 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' will be used where appropriate. This terminology is set out in the table below. In this respect the EPA 2022 Guidelines note that '*all categories of terms do not need to be used for every effect*'.

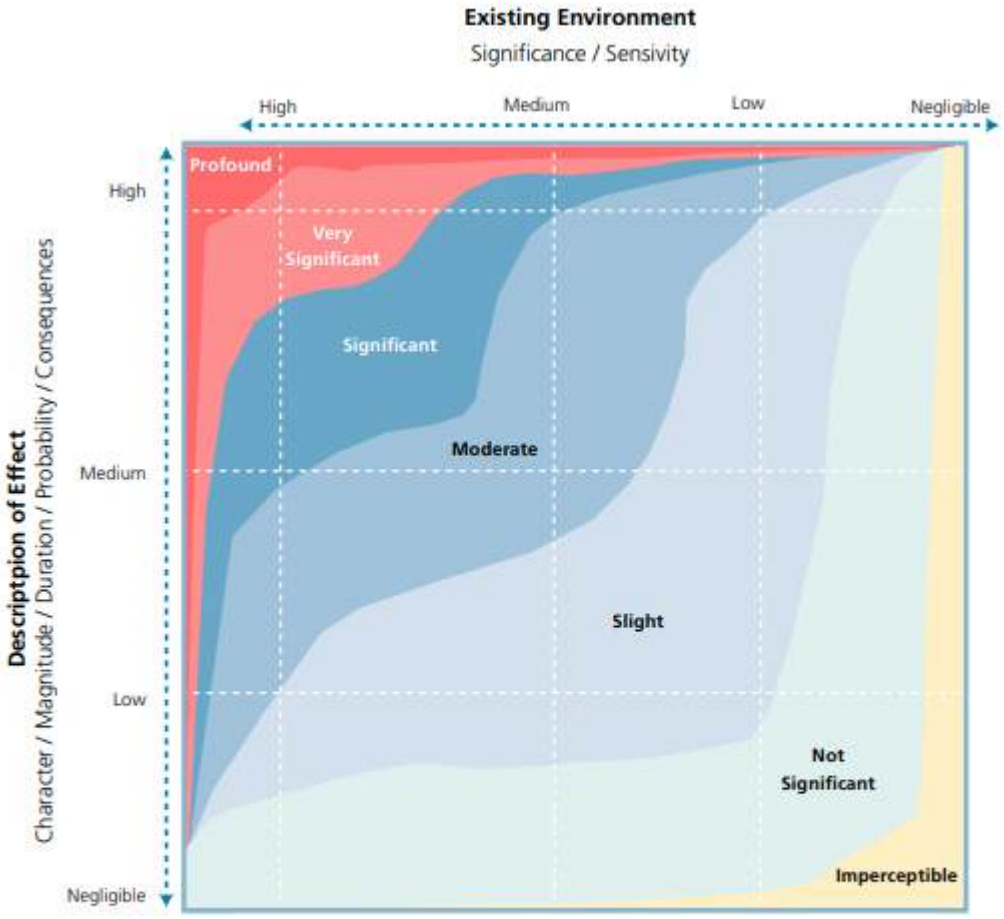
Quality of Effects It is important to inform the non-specialist reader whether an effect is positive, negative or neutral.	**Positive Effects** A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/Adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem, or damaging health or property or by causing nuisance).
Describing the Significance of Effects 'Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see *Determining Significance*).	**Imperceptible** An effect capable of measurement but without significant consequences.
	Not Significant An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
	Very Significant An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
	Profound Effects An effect which obliterates sensitive characteristics.
Describing the Extent and Context of Effects Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.	**Extent** Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
	Context Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

Describing the Probability of Effects Descriptions of effects should establish how likely it is that the predicted effects will occur so that the CA can take a view of the balance of risk over advantage when making a decision.	**Likely Effects** The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects 'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.	**Momentary Effects** Effects lasting from seconds to minutes.
	Brief Effects Effects lasting less than a day.
	Temporary Effects Effects lasting less than a year.
	Short-term Effects Effects lasting one to seven years.
	Medium-term Effects Effects lasting seven to fifteen years.
	Long-term Effects Effects lasting fifteen to sixty years.
	Permanent Effects Effects lasting over sixty years.
	Reversible Effects Effects that can be undone, for example through remediation or restoration.
	Frequency of Effects Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).

Describing the Types of Effects	**Indirect Effects (a.k.a. Secondary or Off-site Effects)** Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative Effects The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
	'Do-nothing Effects' The environment as it would be in the future should the subject project not be carried out.
	'Worst-case' Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable Effects When the full consequences of a change in the environment cannot be described.
	Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SOx and NOx to produce smog).

Figure 1.2: Extract of table 3.4 from the EPA Guidelines 2022

Figure 3.4 from the EPA Guidelines 2022 shows how comparing the character of the predicted effects to the sensitivity of the receiving environment can determine the significance of the effect.



There are seven generalised degrees of effect significance that are commonly used in EIA. Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant and Profound. Generalised definitions of each of these are provided in Table 3.4. When more specific definitions exist within a specialised factor or topic, e.g. biodiversity, these should be used in preference to these generalised definitions. (ref. Advice Notes[68].)

Figure 1.3: Determining significance.

Layout of the chapters

As set out above, for simplicity, and to enable better understanding of all readers, each chapter has been laid out with the following headings.

Receiving Environment (Baseline Situation)

Dynamic description of the specific environment into which the proposal will fit, taking account of other developments likely to occur. The context, character, significance and sensitivity of the baseline is described. The likely evolution of baseline environmental characteristics without implementation of the proposed project.

Characteristics of the Proposed Development

Description of the physical characteristics of a project having regard to

- the site location

- the size, design and appearance of the proposed project
- the cumulation with other proposed projects
- the use of natural resources
- the production of waste
- emissions and nuisances
- the potential risk of accidents.

The description of the development should take account of the full 'life-cycle' including construction, commissioning (if relevant), operation, changes to the project and potential decommission.

Potential Impacts

The potential impact of the proposal comprises a general description of the possible types of impacts which proposals of this kind would be likely to produce. Impact assessment addresses direct, indirect, secondary, cumulative, transboundary, short, medium and long term, permanent, temporary, positive and negative effects as well as impact interactions. This includes consideration of a 'Do Nothing' impact which describes the environment as it would be in the future if the development is not carried out.

Mitigation Measures

A description of any specific remedial or reductive measures considered necessary and practicable resulting from the assessment of potential impacts described above.

Predicted Impacts

An assessment of the net specific impact of the proposal, noting the direct, indirect, secondary, cumulative, transboundary, short, medium and long term, permanent, temporary, positive and negative effects as well as impact interactions which the proposed development may have. The predicted impact assumes all mitigation measures are fully and successfully applied. A 'Worst Case' impact is also considered. A 'Worst Case' impact is an impact arising where a development or its mitigation measures substantially fail.

Monitoring

A description of any post development monitoring of effects of the environment which might be necessary.

Reinstatement

A description of any post development reinstatement measures which might be necessary.

1.8 Competency

For the preparation of this EIAR, the applicant engaged McGill Planning Ltd. to project manage and coordinate the preparation of the EIAR with a team of qualified specialists engaged to prepare individual chapters, as listed in the table below. Details of the competency, qualifications and experience of the authors is also outlined:

Table 1.2: Details of the competency, qualifications and experience of the authors

Chapter	Consultant	Lead Consultant	Qualifications
Introduction & Methodology	McGill Planning Ltd.	Brenda Butterly	BSc Surv., Dip Prop Ec., MRUP, MA (Urban Design), MIPI, MRTPI
Examination of Alternatives			
Description of Development			
Populations & Human Health		Cait Marley	BA (Hons) Joint Honours in Spanish & Geography, MRUP
Interactions			
Summary of Mitigations Measures			
Biodiversity	Altemar Environmental Consultants	Bryan Deegan	MSc in Environmental Science, BSc (Hons.) in Applied Marine Biology, NCEA National Diploma in Applied Aquatic Science and a NCEA National Certificate in Science (Aquaculture).
Traffic & Transportation	Systra Consulting Engineers	Glen Moon	MA (Hons) TPP. Member of the Chartered Institute of Highways and Transportation
Lands, Soils & Geology	Donnachadh O'Brien and Associates Consulting Engineers	Donnachadh O'Brien	Chartered Engineer and a Fellow of the Association of Consulting Engineers of Ireland
Hydrology & Hydrogeology	AWN Consulting	Teri Hayes	BSc MSc PGeol EurGeol). Former President of The International Association of Hydrogeologists (IAH, Irish Group). Professional member of the Institute of Geologists of Ireland (IGI) and European Federation of Geologists (EurGeol).
Material Assets	Donnachadh O'Brien and Associates Consulting Engineers	Donnachadh O'Brien	Chartered Engineer and a Fellow of the Association of Consulting Engineers of Ireland
Noise and Vibration	Traynor Environmental Ltd	Nevin Traynor	BSc. (Hons) Environmental Science & Technology, H. Dip I.T, Certified by Institute of Acoustics in Environmental Noise Measurements and Building Acoustics.

Climate and Air Quality	Traynor Environmental Ltd	Nevin Traynor	BSc. (Hons) Environmental Science & Technology, H. Dip I.T
Waste Management	Traynor Environmental Ltd	Nevin Traynor	BSc. (Hons) Environmental Science & Technology, H. Dip I.T
Landscape and Visual	McGill Planning Ltd.	Trevor Sadler	BA(Hons), MA (Hons), MRUP, MIPI, MRTPI
Cultural Heritage – Archaeology	Shanarc	Marion Sutton	BA, MA, Archaeologist. Honours degree in Archaeology and Geography from NUI Cork and a master's degree in environmental resource management from NUI Dublin.

1.9 Difficulties in Compiling the Specified Information

There were no significant difficulties in completing the Environmental Impact Assessment Report. Any minor difficulties are presented in each of the respective chapters.

While every effort has been made to ensure that the content of this EIAR is consistent there may be instances where typographical errors and/or minor inconsistencies do occur. These are unlikely to have any material impact on the overall findings and assessment contained in this EIAR.

Please note that any red line site boundary shown in this document is for illustrative purposes only. The architect's drawings should be consulted for an accurate red boundary line.

1.10 Availability of the EIAR

A copy of this EIAR document and Non-Technical Summary of the EIAR document is available for purchase at the offices of Fingal County Council at a fee not exceeding the reasonable cost of reproducing the document.

Additionally, prior to lodging this application, the required information has been issued for the Department of Housing, Planning and Local Government's EIA Portal.

2. Alternatives

2.1 Terms of Reference

This section of the EIAR has been prepared by McGill Planning Ltd. It provides a description of the proposed development and explains the evolution of the scheme design through the reasonable alternatives examined.

It is a requirement of the EIA Directive (as amended) to present an outline of the main reasonable alternatives considered, a justification of the final proposed development, including an indication of the main reasons for the option chosen and considering the effects of the project on the environment.

2.2 Introduction

The Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment (2018) state the following:

> *"The Directive requires that information provided by the developer in an EIAR shall include a description of the reasonable alternatives studied by the developer. These are reasonable alternatives, which are relevant to the project and its specific characteristics. The developer must also indicate the main reasons for the option chosen taking into account the effects of the project on the environment.*
>
> *Reasonable alternatives may relate to matters such as project design, technology, location, size and scale."*

This section of the EIAR document provides an outline of the main alternatives examined throughout the design and consultation process under the following headings:

- "Do-nothing" Alternative
- Alternative Locations
- Alternative Designs
- Alternative Layouts
- Alternative Processes

It is noted that "Alternative Uses" has not been carried forward from the Draft Guidelines on the Information to be Contained in Environmental Assessment Reports (EPA 2017) to the final Guidelines published by the EPA in 2022. However, for thoroughness, the Alternative Uses have been considered in this chapter below.

These headings serve to indicate the main reasons for choosing the development proposed, accounting for and providing a comparison of the environmental effects. The type of alternatives depends on the nature of the project proposed and the characteristics of the receiving environment.

The 2018 Guidelines also note that it is generally sufficient for the developer to provide a broad description of each main alternative studied and the key environmental issues. Furthermore, a 'mini-EIA' is not required for each alternative studied.

A full description of the development proposal has been provided in 'Description of Development' Chapter 3.

2.3 Do-Nothing Alternative

This section considers the potential of the proposed development not taking place. In a 'Do Nothing' scenario, the subject site would remain as undeveloped greenfield within an urban setting.

The majority of the is identified as an Action Area Plan 3, with a zoning of Mixed Use on the majority of the site in the Arklow and Environs Local Area Plan 2018-2024. An area to the south is identified as the Arklow Town Marsh pNHA. The "*MU: Mixed Use"* zoned land has the objective *"To provide for mixed use development."* It also states that "*The nature of the mixed-use development envisaged for any particular site is set out in the text of the plan.*" As a result, and as set out in the AAP3 text, this site, which is part of a wider Action Area Plan is expected to deliver the following:

- *Vehicular access to the Action Area shall be provided from the L-6179 or from the Regional Road if it is possible, with the roads configuration of the development providing / facilitating a possible future third Avoca river crossing; other, secondary access routes from the adjacent road network shall also be provided as may be possible;*
- *A number of pedestrian access routes into the action area shall be provided where possible from adjacent developed areas; A maximum of 1,500 residential units shall be provided, in a range of development formats, densities, unit sizes and designs.*
- *To achieve a sense of place and allow for visual diversity any residential application should provide for a number of identifiable and distinct housing estates (not exceeding 200 units), each containing materially different house designs within an overall unified theme.;*
- *A minimum of 5ha shall be reserved for the provision of a school campus (CE Community and Education Zone) on lands zoned CE to the north east of the AAP, subject to consultation and agreement with relevant stakeholders, including the Department of Education and Skills;*
- *A local shops and services centre (LSS zone), of scale commensurate with the needs of the future population of the Action Area shall be provided, on a site of c. 1ha.*
- *A minimum area of 12ha shall be developed as public open space, of which a minimum area of 4.5ha shall be laid for active sports uses (AOS zone); remaining open areas shall been laid out as informal parks and walks, and shall include a minimum of 2 equipped children's play areas;*
- *The development shall be delivered in phases such that adequate road infrastructure and local services are provided for each phase; in particular, the road infrastructure to serve the action area plan and local shops & services sites shall be provided in Phase 1 accompanied by no more than 50% of the residential development; and the open space and strategic road infrastructure shall be provided no later than Phase 2 accompanied by no more than 75% of the residential units (an additional 25% on top of Phase 1).*
- *Any development proposals shall have regard to the setting and curtilage of structures and sites of heritage value, and habitats of biodiversity value and appropriate buffer zones-/mitigating measures shall be provided as required.*

The area to the south includes the marsh and Avoca River, connecting the site to the Main Street in Arklow. The marsh lands are zoned Arklow Town Marsh pNHA. As set out in the LAP Chapter 10 "*The marsh is the principal wetland habitat in the area, providing an important flood control role and supporting a variety of plant and animal life, in particular reed species and bird life."* Relevant Heritage Objectives relating to this zoning are:

- HT1 which aims "*To maintain the favourable conservation status of all proposed and future Natural Heritage Areas (NHAs) in the plan area in particular the Arklow Marsh and to support*

environmentally sensitive measures to enhance the understanding and enjoyment of such natural areas."

- HT3 which aims to "*Protect and enhance the character, setting and environmental quality of natural, architectural and archaeological heritage, and in particular those features of the natural landscape and built structures that contribute to its special interest. The natural, architectural and archaeological heritage of the area shall be protected in accordance with the objectives set out in the Wicklow County Development Plan*"
- HT8 which aims to "*To facilitate the development and enhancement of green infrastructure resources, including access to, connectivity between areas of interest and linkages between green spaces including the coast, where feasible within Arklow and environs settlement boundary (see Map No. 10.1)."*
- HT9 which aims to "*To maintain the conservation value of all proposed and future Natural Heritage Areas (NHAs) and to protect other designated ecological sites in Arklow and Environs."*

These objectives allow for the enhancement of and access to areas of interest, green space and natural landscape provided they are appropriately protected and sensitively developed. In this regard, a pedestrian bridge over the pNHA is in accordance with the zoning of the site and therefore in accordance with the Development Plan and LAP for the area.

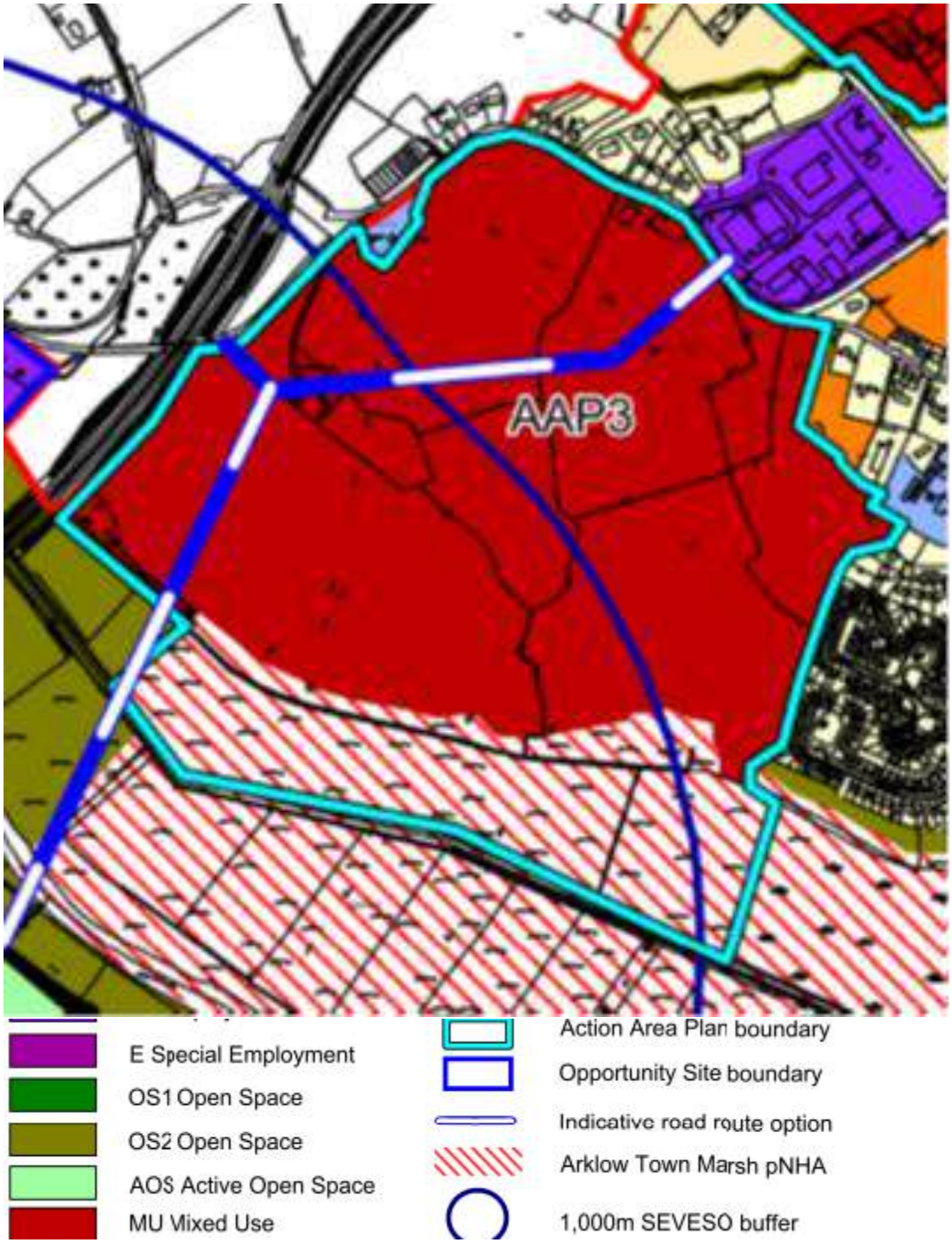


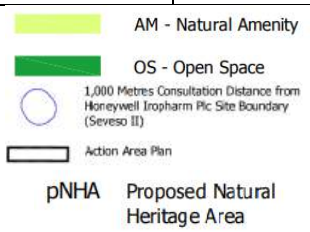
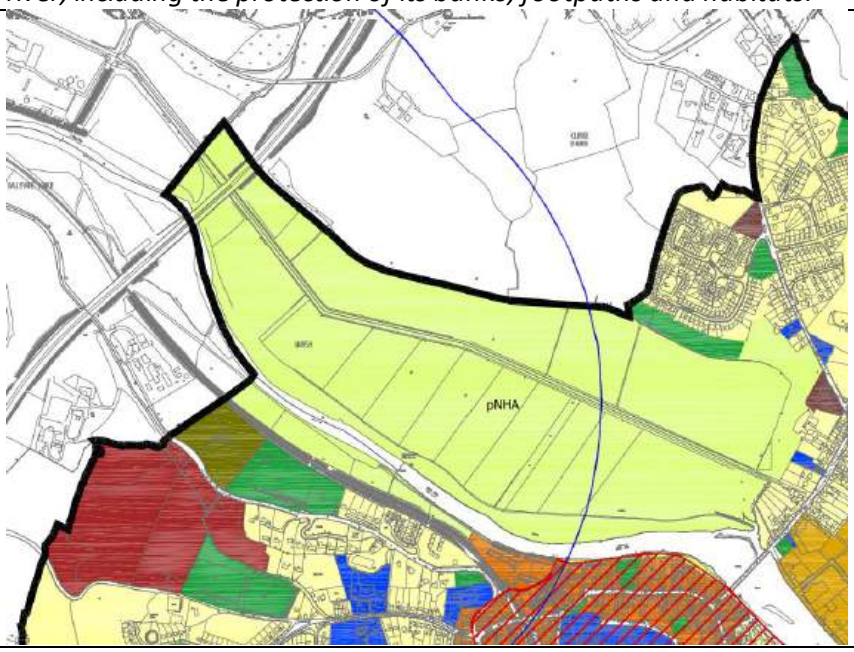
Figure 2.1 Fingal Development Plan 2023-2029

The zoning of this subject site has altered since the Arklow Local Area Plan 2005-2011. This site was originally agricultural land with the Marsh Area zoned as a Conservation Area.

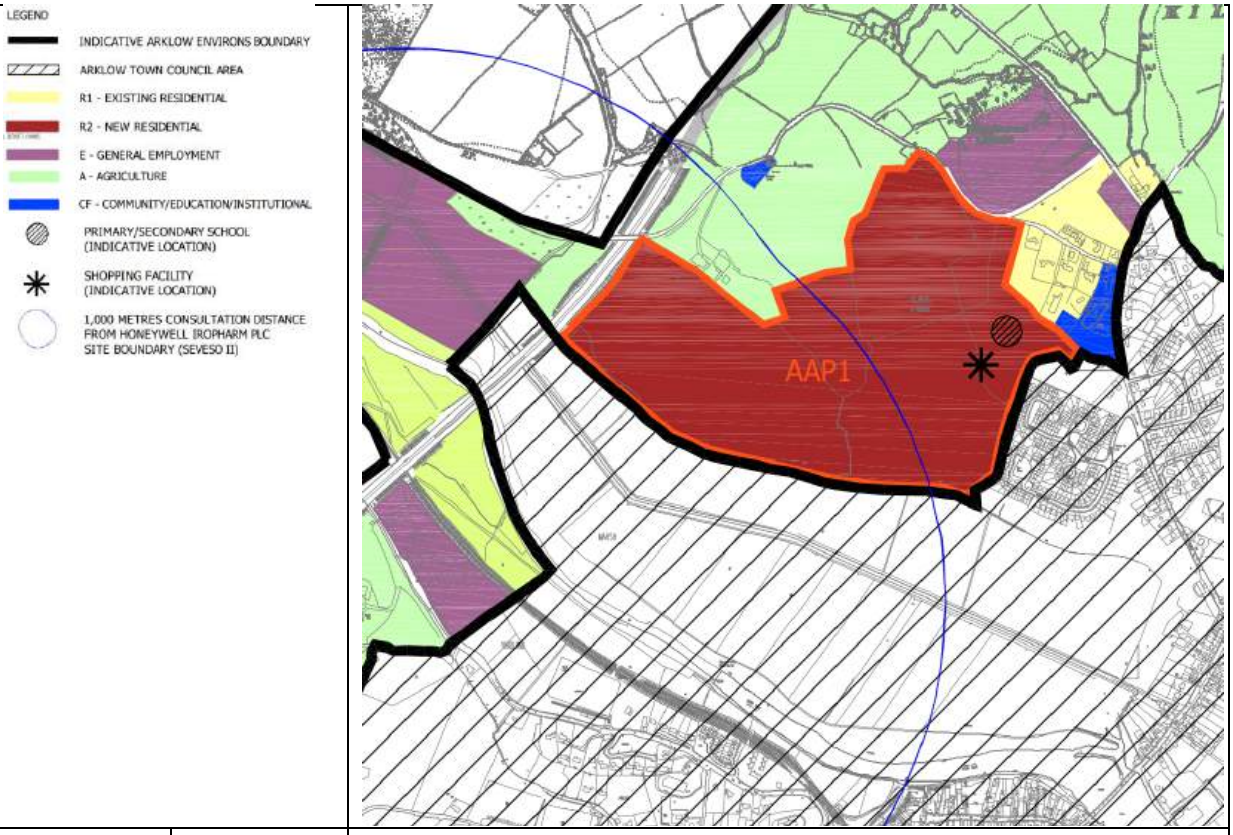
The designation of part of the site for as an Action Area with Residential zoning was identified in 2006, with this land, which is the subject of this planning application, being identified as appropriate for a new residential to support the objectives of the Wicklow Development Plan. This Action Area was subsequently expanded to cover the entire Masterplan Lands and reflects the current AAP3 Zoning in the 2011 – 2017 Arklow and Environs Local Area Plan.

A chronological summary of the subject site zoning is displayed in *Table 2.1* below.

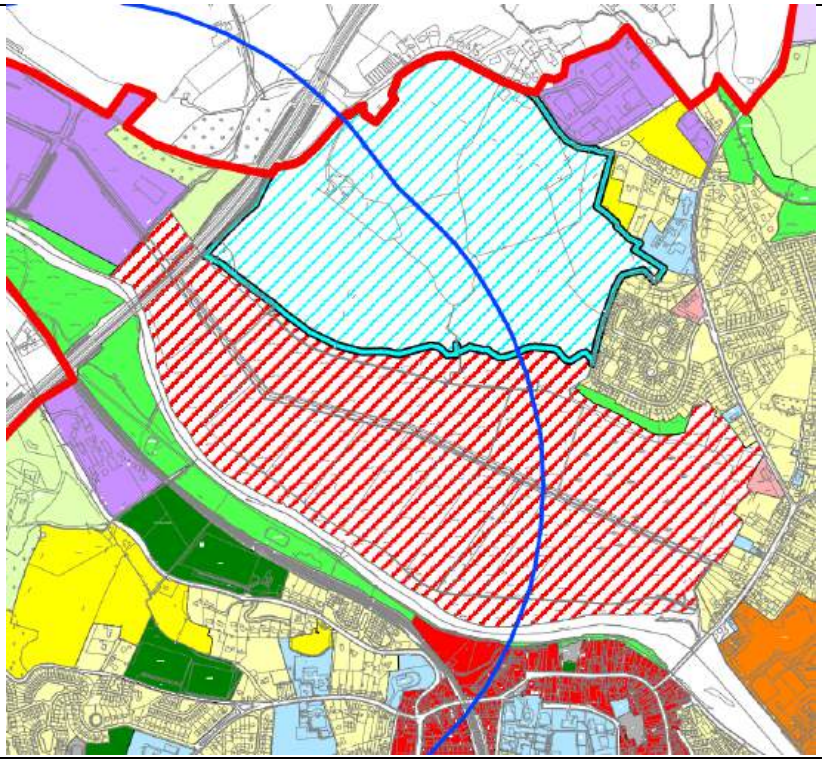
Table 2.1: Chronological Summary of the Subject Site Zoning

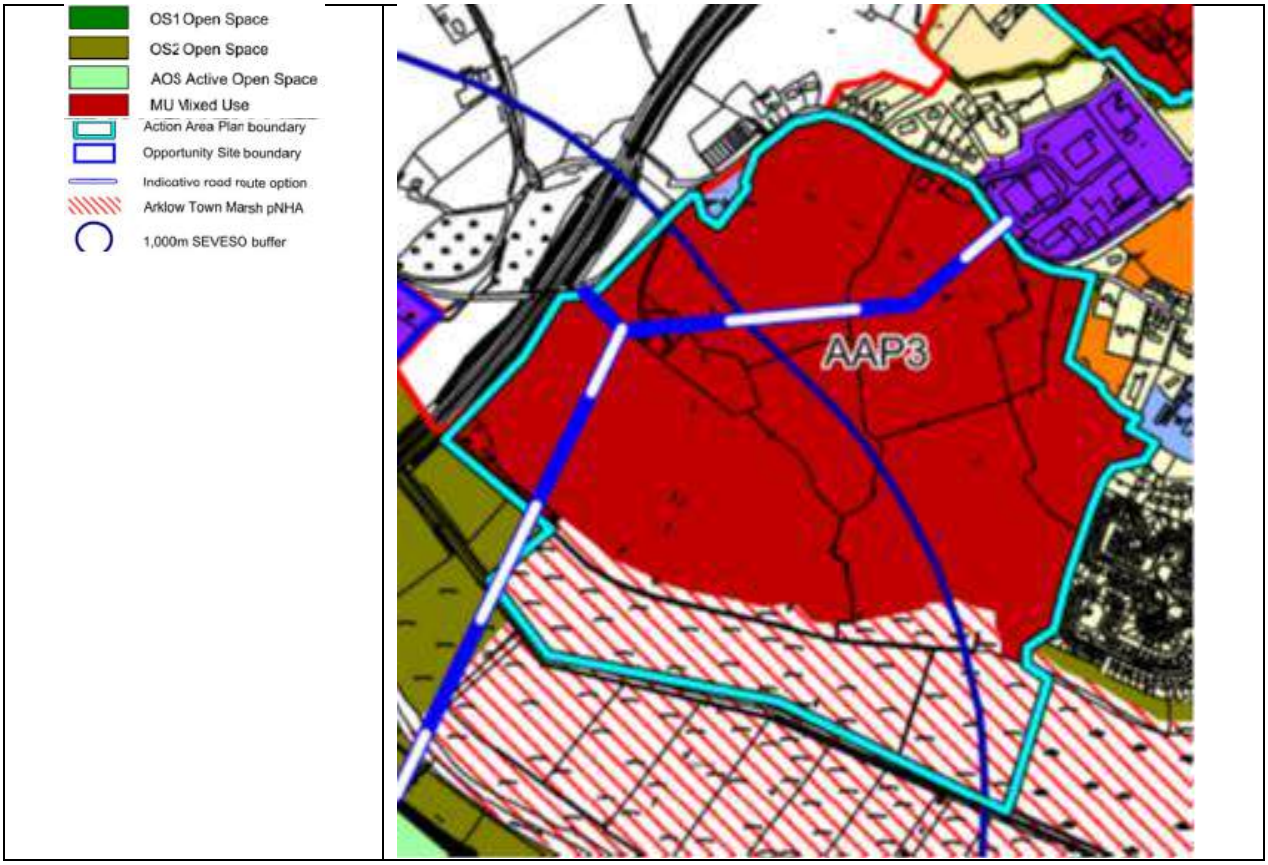
Plan Timeframe	Site Zoning	Objective
Arklow Town Development Plan 2005-2011	White zoned land	In this plan, the site was unzoned, or agricultural land. Therefore, no built development was proposed on this land as part of this Development Plan.
	PNHA Proposed Natural Heritage Area	A pNHA was identified on the Marsh lands to the south and it was also identified as a Natural Amenity Area.
	AM Natural Amenity	The objectives with regard to the Marsh were as follows: *The Marsh is a large area on the North bank of the Avoca, designated as Natural Heritage Area. It constitutes an inner-town wildlife habitat and is of vital importance as it functions as a flood storage plain during times of very high flow in the river. It was the objective in the previous plan to maintain the Marsh as a wildlife conservation area and to allow some public access.* *Key policies were:* *NHP 1 Protect the Town Marsh as a Natural Heritage Area.* *NHP 2 Develop the Town Marsh in conjunction with Department of the Environment, Heritage and Local Government, into a regional visitors attraction with restricted public access and an interpretation strategy in form of guided tours, interpretative signs etc.* *NHP 3 Protect and enhance the amenity and tourist value of the Avoca river, including the protection of its banks, footpaths and habitats.*
		

Arklow Environs Local Area Plan 2006-2012	Arklow Environs Boundary	This plan related to the Arklow Rural and Kilbride Electoral Divisions. This plan was developed in the context of Arklow as a Large Growth Town with a population range of 15,000 to 25,000. The aim was to ensure there were sufficient lands zoned for residential uses to accommodate the projected population and housing demand as illustrated in the County Housing Strategy. The vision of this plan was "*To facilitate the sustainable expansion of Arklow & Environs in terms of new residential neighbourhoods and employment opportunities close to the town while protecting existing rural communities, the rural landscape, areas of high visual amenity, and existing natural and cultural amenities."*
	R2 New Residential	The majority of the subject site is identified as "*New Residential: To provide for new residential communities in accordance with Section 6.2.1 of this Local Area Plan*." Also identified for the site are a new school and shopping facility both at an indicative location. Under this category in section 5.5 Kilbride is identified as "*The focus of future residential development in Arklow and its Environs will be on the Kilbride area*. *The recommended area to be rezoned comprises approximately 48 hectares. To cater for the future population in the area the Council will reserve an appropriate site for an additional primary and secondary school.* *In addition, it is proposed to provide a supermarket with an approximate net floor area of 3,500 m2 with a number of adjoining smaller retail units and services i.e. doctors, dentists, post office etc. and community facilities in the Kilbride area.* *In order to ensure the orderly provision of these facilities concurrently with residential development, this area shall be the subject of an Action Area Plan (AAP 1), which must be approved by the Council prior any planning application being granted on these lands. The Action Area Plan must assess the impact of development on the Town Marsh and the potential for flooding in the area."*
	A - Agriculture	The very north west of the site remains zoned agricultural use within this LAP. The objective is to *"Agriculture: To protect and improve rural amenities and character. To provide for the development of agriculture."*

		
Arklow Town and Environs Development Plan 2011-2017	Defines Arklow Town and Environs Boundary	This plan redefines and further expands the Arklow Town and Environs Boundary. This include expanding further the AAP zoned land to the size and shape currently in the Development Plan and current LAP. The vision for this plan is "*For Arklow town and its Environs (plan area) to be a cohesive community of people enjoying distinct but interrelated urban and rural environment; where natural surroundings and important resources are protected; where opportunities abound to live and work in a safe atmosphere, allowing people to enjoy the benefits of well paid jobs, a variety of housing choices, excellent public services, ample cultural and leisure opportunities, and a healthy environment.*"
	Conservation Zone	Under BD2 the plans objective is "*To maintain the favourable conservation status of all proposed and future Natural Heritage Areas (NHAs) in the plan area in particular the Arklow Marsh which has been designated a 'Conservation Zone'.*"
	Action Area	The expanded Kilbride AA is identified for 1,500 residential units. It states under RE2 that "*Lands at Tinahask (Action Areas 1 & 2) and Kilbride (Action Area 3) shall be developed as comprehensive (not piecemeal) integrated schemes that allow for the sustainable phased and managed development of each action area during the plan period.*" This AA3 Kilbride identifies the following: "*This Action Area measures c. 60.8ha and is bounded to the north by Local secondary road L-6179 Ticknock – Kilbride (the Kilbride – old IFI plant road) to the east by existing developed areas mainly in residential*

		and community / educational use, to the south by Arklow Marsh and to the west by the M11. This Action Area shall be developed as a mixed residential, community and open space zone in accordance with the following criteria:- • *Vehicular access to the Action Area shall be provided L-6179, with the roads configuration of the development providing / facilitating a possible future third Avoca river crossing; other, secondary access routes from the adjacent road network shall also be provided as may be possible;* • *A number of pedestrian access routes into the action area shall be provided where possible from adjacent developed areas;* • *A maximum of 1,500 residential units shall be provided, in a range of development formats, densities, unit sizes and designs. To achieve a sense of place and allow for visual diversity any residential application should provide for a number of identifiable and distinct housing estates (not exceeding 200 units), each containing materially different house designs within an overall unified theme.;* • *A minimum of 7ha shall be reserved for the provision of primary and post primary schools, which may be located on a single campus, subject to consultation and agreement with relevant stakeholders, including the Department of Education and Skills;* • *A neighbourhood centre, of scale commensurate with the needs of the future population of the Action Area shall be provided, on a site of c. 1.2ha. Such a centre may provide for one supermarket / discount retailer of up to 1,500sqm and a number of smaller local shops and services, including non-retail and professional services, in the order to 1,000sqm;* • *A minimum area of 9ha shall be developed as public open space, of which a minimum area of 6.75ha shall be laid for active sports uses in a range of track, pitch and court types suitable for a variety of sports and shall include necessary car parking, lighting and changing facilities; remaining open areas shall been laid out as informal parks and walks, and shall include a number (minimum 2) of equipped children's play areas;* • *Any development proposals shall have regard to the setting and curtilage of structures and sites of heritage value, and habitats of biodiversity value and appropriate buffer zones-/mitigating measures shall be provided as required."*
	AR1	This policy objective aims "*To safeguard archaeological heritage by ensuring that development in the vicinity of a recorded monument which are listed in table 7.1 below shall be permitted only where it can be demonstrated that there will be no damage to the monument itself, its setting or its cultural and educational value*." Within Table 7.1 the Kilbride Church (in ruins), Grave Yard, Mausoleum are identified.

		
Arklow Town and Environs Development Plan 2018-2024	MU	The "*MU: Mixed Use"* zoned land has the objective *"To provide for mixed use development."* It also states that "*The nature of the mixed-use development envisaged for any particular site is set out in the text of the plan."*
	AAP3	As set out above under the Do Nothing Alternative text, this site is zoned for mixture of uses including - Residential development accounting for 1,500 units - New School - New Local centre - New active open space - New Regional Road
	1,000m SEVESO Buffer	This SEVESO Buffer has been identified in all previous Plans set out above.
	Indicative Road Route Option	While a new route was indicated on some plans, this is the first that introduced it on the Zoning Map
	Arklow Town Marsh pNHA	This Marsh continues to have the benefit of a future NHA and conservation zoning which has remained similar to that indicated on the zoning maps in 2005.



Although zoning MU permits several uses as listed in land use zoning matrix, no other proposals for the subject site have come forward in the time that the site has been zoned as an Action Area for development. The site has remained in agricultural use and undeveloped for over 19 years, with the Action Area increasing in size over time.

Therefore, a 'do-nothing' alternative would likely result in the subject site remaining in agricultural use and undeveloped for the foreseeable future. The natural attributes of the site would remain unchanged with existing features such as trees, hedgerows, vegetation, flora and fauna remaining in-situ and undisturbed from man-made influences.

This would mean that these zoned lands would not be developed in accordance with the objectives of the current Local Area Plan for Arklow and the Environs or the Wicklow Development Plan. It would remain underutilised land. This in turn would have the knock-on impact of the Masterplan/County Development Plan not being implemented as planned, potentially creating pressures to develop unzoned, unserviced or remote sites elsewhere, that would not promote sustainable development and compact urban growth.

This is not in line with National, Regional or Local Plan policies which require the efficient use of zoned land such as these. Furthermore, these lands are considered highly sustainable and suitable for development due to its proximity to existing public transport facilities, along with a wide range of services and community facilities within the area which are key considerations for the development of any zoned site. It would also delay or inhibit the delivery of proposed public infrastructure envisaged as part of the Masterplan for the site including public open space, pedestrian and cycle links to the permitted school site, as well as the future second phase of the masterplan which includes sports

fields and neighbourhood centre resulting in a lack of connectivity to the future school, local centre and other future residential properties.

2.4 Alternative Locations

The 2018 Guidelines note that some projects may be "site specific" so the consideration of alternative sites may not be relevant or warranted in every case.

This point is also made in the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022), which states that in some instances alternative locations may not be applicable or available for a specific project which is identified for a specific location. Regarding locations, the consideration of alternatives in many cases have been addressed and decided at strategic planning level during the adoption of the Fingal Development Plan 2023-2029.

Furthermore, these plans, including the Development Plan and Arklow and Environs Local Area Plan 2018-2024, has been subject to Strategic Environmental Assessment which considers the environmental considerations associated with, for example, the cumulative impact of an area zoned for residential or mixed use on a sensitive landscape. The Guidelines also state that the statutory development plans can establish project-level objectives or other mitigation that a subsequent site project and its EIAR should be cognisant of.

In this regard, we note that the subject site is located within Wicklow County Council administrative area and is primarily zoned "*MU: Mixed Use"* with the objective *"To provide for mixed use development."* The adopted Wicklow Development Plan 2022-2028 outlines that *"Separate Local Area Plans are in place, which will be reviewed after the adoption of this plan, for the following towns / areas: Bray Municipal District, Wicklow Town - Rathnew, Arklow, Greystones – Delgany - Kilcoole and Blessington. These Local Area Plans are reviewed and made under Sections 18, 19 and 20 of the Planning and Development Act, and as such do not form part of the CDP. However, the CDP does provide the key parameters for these Local Area Plans such as the future population and housing targets and sets out the broad strategy for the future economic and social development of these towns."*

The objective of zoning *'MU* is to facilitate mixed use development in line with the LAP. This objective remains in place until a new LAP is provided. However, the overarching objective of the Development Plan, as implemented by the current and future LAP, is to ensure *zoning will be provided on the basis of the land needed to meet the 2031 population target, with clear objectives to ensure 2026 targets can be reached.*

A portion of the site to the south is zoned Arklow Town Marsh pNHA. The area to the south includes the marsh and Avoca River, connecting the site to the Main Street in Arklow. "*The marsh is the principal wetland habitat in the area, providing an important flood control role and supporting a variety of plant and animal life, in particular reed species and bird life."*

These objectives allow for the enhancement of and access to areas of interest, green space and natural landscape provided they are appropriately protected and sensitively developed. In this regard, a pedestrian bridge over the pNHA is in accordance with the zoning of the site and therefore in accordance with the Development Plan and LAP for the area.

Therefore, having regard to the strategic planning policy context and objectives already associated with the subject site, the location of the site was considered as suitable for a mixed use, residential led development, and so alternative locations were not considered for this Large-Scale Residential Development (LRD).

2.5 Alternative Uses

The proposed development is predominantly zoned as Action Area Plan 3 with 'MU – Mixed Use'. The amount of residential development required is set out in the AP3 plan.

A portion of the site to the south is zoned Arklow Town Marsh pNHA. "*The marsh is the principal wetland habitat in the area, providing an important flood control role and supporting a variety of plant and animal life, in particular reed species and bird life."*

The LAP stats that

Zoning	Zoning Objective
Mixed Use (MU)	To provide for mixed use development
	Zoning Vision
	Uses generally appropriate for any mixed-use areas will be specified in the plan.
	Permitted in Principle
	As set out in AAP3 the following uses are identified: - 1,500 residential units, under the Residential Zoning it states that "*Residential (RE. R10, R20, R28, R Special) – Uses include houses, apartments, residential open space, education, community facilities, retirement homes, nursing homes, childcare, health centres, guest house, bed and breakfast, places of public worship, home based economic activity, utility installations and ancillary development and other residential uses in accordance with the CDP."* - School campus under the Community and Educational zoning "*Community and educational (CE) – Uses include community, educational and institutional uses include burial grounds, places of worship, schools, training facilities, community hall, nursing homes, health related developments, sports and recreational facilities, utility installations and ancillary developments for community, educational and institutional uses in accordance with the CDP."* - Local shops and services centre under the Local shops and services zoning *"Local shops and services (LSS) – Uses include retail, retail services, health, public house, guest houses, parking, residential development, commercial, office, tourism and recreational uses, community, including provision for religious use, utility installations and ancillary developments for local shops and services uses in accordance with the CDP."* - Open Space, there are three zonings identified in the LAP as follows:

	Active open space (AOS) zoned land are sport and active recreational uses including infrastructure and buildings associated with same. *Open space (OS1) zoned land are formal / informal landscaped parks with off-road walking / cycling paths, as well as playgrounds, skate parks, 'Mixed Use Games Areas' and outdoor gyms.* *Open space (OS2) zoned land are uses that protect and enhance the function of these areas as flood plains, buffer zones along watercourses and rivers, green breaks between built up areas, green corridors and areas of natural biodiversity. As these open lands are not identified or deemed necessary for development for recreational purposes, other uses that are deemed compatible with proper planning and sustainable development may be open for consideration where they do not undermine the purpose of this zoning.*
Arklow Town Marsh pNHA	**Heritage Objectives**
	HT1: To maintain the favourable conservation status of all proposed and future Natural Heritage Areas (NHAs) in the plan area in particular the Arklow Marsh and to support environmentally sensitive measures to enhance the understanding and enjoyment of such natural areas.
	Permitted in Principle
	AAP3 provides for/ facilitates "*a possible future third Avoca river crossing; other, secondary access routes from the adjacent road network shall also be provided as may be possible*"

The proposed development including the pedestrian bridge across the Marsh, the public open space, the local neighbourhood centre and the residential development, accords with the zoning objectives for the area in the Local Area Plan and the specific requirements of AAP 3.

The proposed development is in line with the objectives of "Housing for All", as it represents an increase in housing supply in the area including social housing and includes ancillary uses in the form of a new creche facility.

The lack of housing supply in Ireland is a well-documented and ongoing issue. The proposed development incorporates the construction of 666 no. units including houses, townhouses, duplex apartments and apartments, all of which will service demand in the area. As such this is considered the most appropriate use of the land.

The development strategy for Arklow as set out in the Wicklow Development Plan 2022-2028 and the associated Local Area Plan 2018-2024 identified the subject site as being most suited for residential led, mixed use, development. The AAP3 envisioned the subject lands to become a vibrant residential and mixed-use community.

The proposed residential development includes ancillary community amenities, retail and a childcare/creche facility to serve the needs of the proposed development. Employment generating

activities were envisioned to be located outside the site boundary, within the town centre to the south and the waterfront to the east.

Other lands within the AAP3 site, but not the subject of this application have already been granted planning permission including a School Campus to the north east of the site the subject of this EIAR. To the south east of the site 84 no. residential units have been granted planning permission in accordance with the AAP3 plan.

It is also considered that commercial uses could be accommodated within the town centre to the south or on zoned employment lands to the north which would consolidate established employment related uses and create a more compact and higher density employment zone in this area. These locations are more appropriate for commercial and retail activities due to the location within the town centre or due to other similar employment uses in the vicinity. If large scale commercial/ employment uses were proposed within this proposed area it would compete, potentially negatively, with the existing town centre and employment uses in the wider area, resulting in the further failure of both. However, as currently proposed as a residential development, with a small local centre and creche, it is ideally located to support the vitality and viability of the existing and future services.

Accordingly, the consideration of alternative uses on the subject site were not considered necessary or justified.

2.6 Alternative Designs

The final layout and design of the proposed scheme has altered over time as a result of design evolution and consultation with Wicklow County Council. Numerous variations of the scheme have been assessed and audited, with amendments to the design incorporated where appropriate and having regard to the key environmental issues pertaining to the lands. The environmental issues which have most informed the design process to date relate to the Marsh and ecology, water, noise, linkages to the town centre, and the potential impacts upon existing and future traffic and transport in the area.

Such environmental issues have served to inform the consideration of alternative layouts and scheme designs up to the finalisation of the proposal submitted by way of the planning application. The proposed layout and design have also been influenced by the site's specific topography, existing boundary and vegetation, and permitted developments within the AAP3 lands. The site is an irregularly shaped, greenfield site that slopes towards the river.

The progression of the proposed developments layout and design has therefore been formed by these environmental considerations. The design has evolved from this base through an iterative process. The alternative layout and design options that were considered are discussed below in section 2.7 Alternative Layouts.

Existing constraints on the site influenced the layout of the site and include:

- To the south is the Marsh, and the potential flood zones, ensuring development is not in either.
- Through the centre of the AAP3 Lands, to the north of the subject site, the ESB Power Lines that run in a northeast to south west direction in the northern section of the site.
- Trees and hedgerows around the site along with a drainage ditch to the east of the application site.

- Topography of the site, resulting in a change in height as the site runs north to south, falling towards the marsh.
- Existing residential and schools surrounding the site.
- Protection of the Pyramid of Arklow outside the site.
- Requirement to meet the specific objectives of AAP3
    - 1,500 residential units,
    - local centres,
    - open spaces and active facilities
    - new link road and connection into the town centre
    - protecting the Marsh.
- Accommodating the permitted WCC Reg Ref: 23/756 for 84 residential units to the south-east of the application site, and WCC Reg Ref:22/213 for an educational campus, both of which included the new link road location.
- Enabling the future development of the remainder of the AAP3 lands to the north.

As a result of these constraints, along with the prescriptive requirements set out in AAP3 the iterations of the design are very similar. However, the pros and cons of each variation is set out below.

2.7 Alternative Layouts

The subject site is an irregular shape. Within the boundaries of the site, there is an existing building and associated outbuildings which are proposed for demolition. In terms of topography, the site has significant changes in level, sloping from north to south and from east to west towards the Marsh and Avoca River. Existing hedgerows and trees are on site, forming field boundaries along with native vegetation along the marsh. Kilbride Road provides the primary access into the site.

Six different layouts and designs (Alternatives A-F) were considered for this site taking into account the constraints and the requirements of AAP3.

Alternative Layout A – Initial proposal

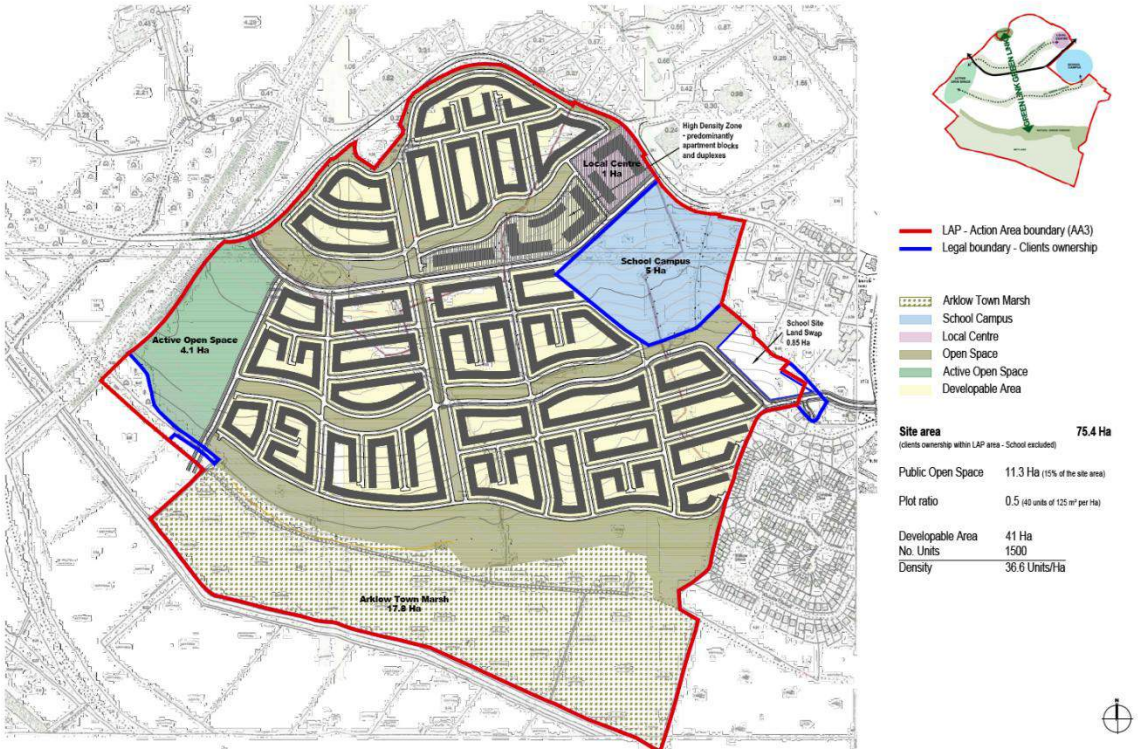


Figure 2.2: Alternative Layout A – Initial proposal

Alternative A was an initial iteration of the potential layout of the site. This layout had the local neighbourhood centre opposite the school campus site, at the entrance to the development. It included a green route through from Monument Lane running west to the proposed Active Open Space area. A north west to south east route was also proposed reflecting the location of the Arklow Pyramid. However, this proposed layout did not take account of the large ESB powerline which run across the site.

Alternative A - Comparison of Environmental effects:

The scheme proposed would result in 1,500 units to the hectare in terms of density. The proposed car parking ratio was 2 car spaces per housing unit. However, the critical problems with this layout were:

- The scheme did not take account of the ESB 110KW Overhead powerlines and the associated exclusion zone.
- The location of the neighbourhood centre at the the edge of the road would result in the majority of the residential units a considerable distance away from the any convenience shops.
- Development close to watercourses to the east
- No phasing for this proposed scheme was developed

Positive elements incorporated were

- Appropriate connection to the Kilbride Road
- Large areas of public open space
- Protection of town marsh with properties overlooking this area

Alternative Layout B – S247 Request for Strategic Housing Development

Figure 2.3: Overall Masterplan for APP3 Lands

Figure 2.4: Phase 1 of Masterplan

Figure 2.5: Phase 1 Site Layout Plan

Alternative B relates to the design submitted for the S247 consultation with Wicklow County Council (WCC) in May 2019, with the S247 Meeting in July 2019. This was a S247 as part of a proposed Strategic Housing Development for the subject site. This design was evolved to Pre-application Meeting Request with An Bord Pleanála, it was never submitted as a full application.

The S247 from 2019 proposed 752 units in total, which comprised primarily houses, a local centre and two creches. The proposed scheme also included the new link road which would connect across the Avoca River to the north of Arklow Main Street. To enable a second access, third party land, along with a land swop was proposed with St Joseph's National school to provide access out to the Dublin Road.

Alternative B - Comparison of Environmental effects:

The scheme proposed would result 30 units to the hectare in terms of density. The proposed car parking ratio was 2 car spaces per housing unit. Key elements which were considered a positive are the:

- New link route aligning with the ESB Power Lines, enabling coherent development on either side of this exclusion zone.
- Appropriate connection to the Kilbride Road
- Creation of pedestrian link to the south
- Large areas of public open space
- The central location of the local centre within the wider future masterplan development
- Protection of town marsh while enabling a pedestrian link across this area into the Main Street

The advice received from Wicklow County Council with respect to this design proposal included the following:

- The proposed development was ahead of the OPW Flood Relief scheme.
- A Social Infrastructure Audit should be carried out. It was queried whether two creches were required.
- The road cycle network needed to be reviewed to enable safe cycle and also pedestrian routes through the site.
- The alignment of the link/ spine road should accommodate a link and associated bridges over the rive to Vale Road.
- All open spaces should be overlooked.
- Any proposed pitches associated with the school should be examined in terms of impacts on future residents in terms of noise and light.
- Any proposed laneways should be re-examined.
- The phasing of the development was queried and whether the local centre could be delivered earlier.

Alternative Layout C - SHD Pre-application Opinion Meeting Request submitted to ABP

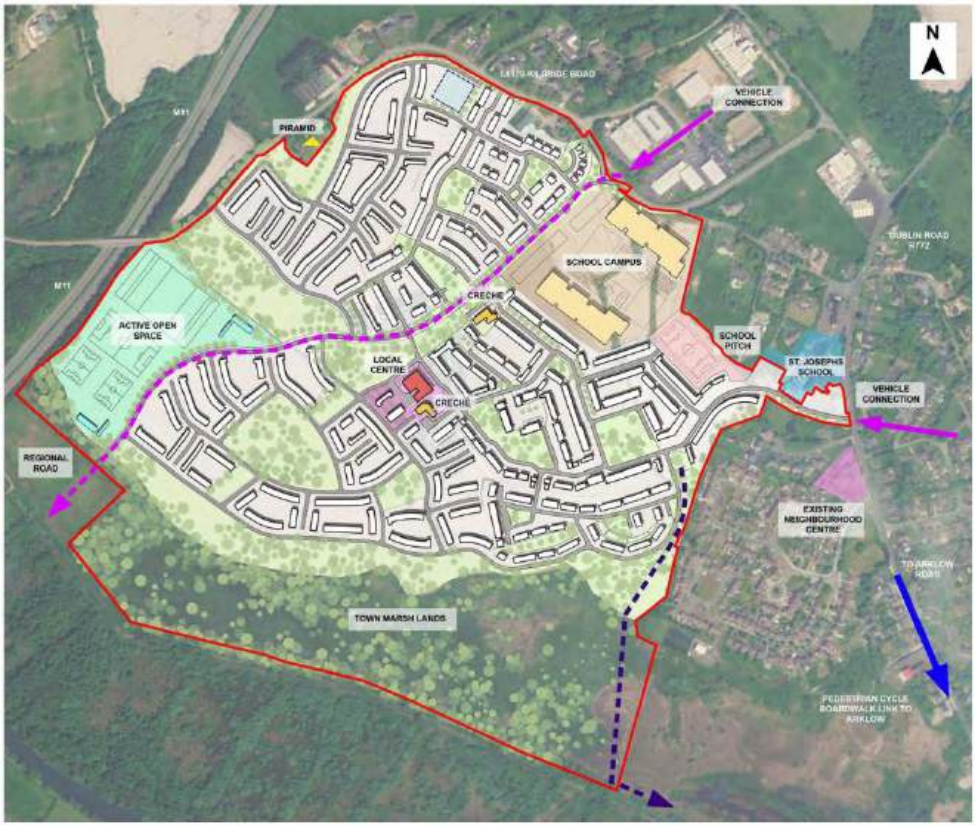


Figure 2.6: Overall Masterplan

Figure 2.7: Alternative Layout C Layout

Figure 2.8: Alternative Layout C Overall Landscape Masterplan

These alternatives were developed following the S247 meeting with Wicklow County Council. The option was put before An Bord Pleanála as part of the Strategic Housing Development Pre-Application Consultation request.

Key fundamental elements established within this and the S247 have been carried forward in all subsequent designs including:

- Regional/ new link road running under the ESB Lines connecting from the Kilbride Road, through the site to the local centre and the future sports area.
- A pedestrian connection to the south of the site, although the route has altered.
- A clearly defined boundary for development along the southern boundary, that does not encroach on the Marsh pNHA.
- The local centre on the north west edge of phase 1, to the south side of the link road, which will become the centre of the overall AAP3 lands.
- School campus reserved with access from the link road.

Alternative Layout C Comparison of Environmental effects:
The proposed development provided for 759 no residential units and provided the first section of the regional road.

However, this proposal also resulted in the following issues:

- The new pedestrian route to the south ran partially across the marsh and then east, connecting to the Dublin Road. This was not considered to deliver future occupants close enough to the town centre.
- A new vehicular route to the east was also proposed, along with a land swop with the St Joseph's National School, resulting in new school pitches.

Issues raised by An Bord Pleanála included:

- Whether the application was premature prior to the Arklow Waste Water Treatment Plant being completed.
- There was a potential conflict with the Arklow Flood Relief Scheme, and the timelines for same.
- The unit mix proposed in the development should include greater number of smaller units.
- Delivering permeability through the site, in particular to the future school campus.
- Impact of the new junction onto the Dublin Road on both St Joseph's Primary school and Carrigmore Estate
- Pedestrian and cyclist connectivity along the Kilbride Estate.

Alternative Layout D – S247 Meeting request to Wicklow County Council for a Large scale Residential Development

Figure 2.9: Alternative Layout D – Overall Masterplan

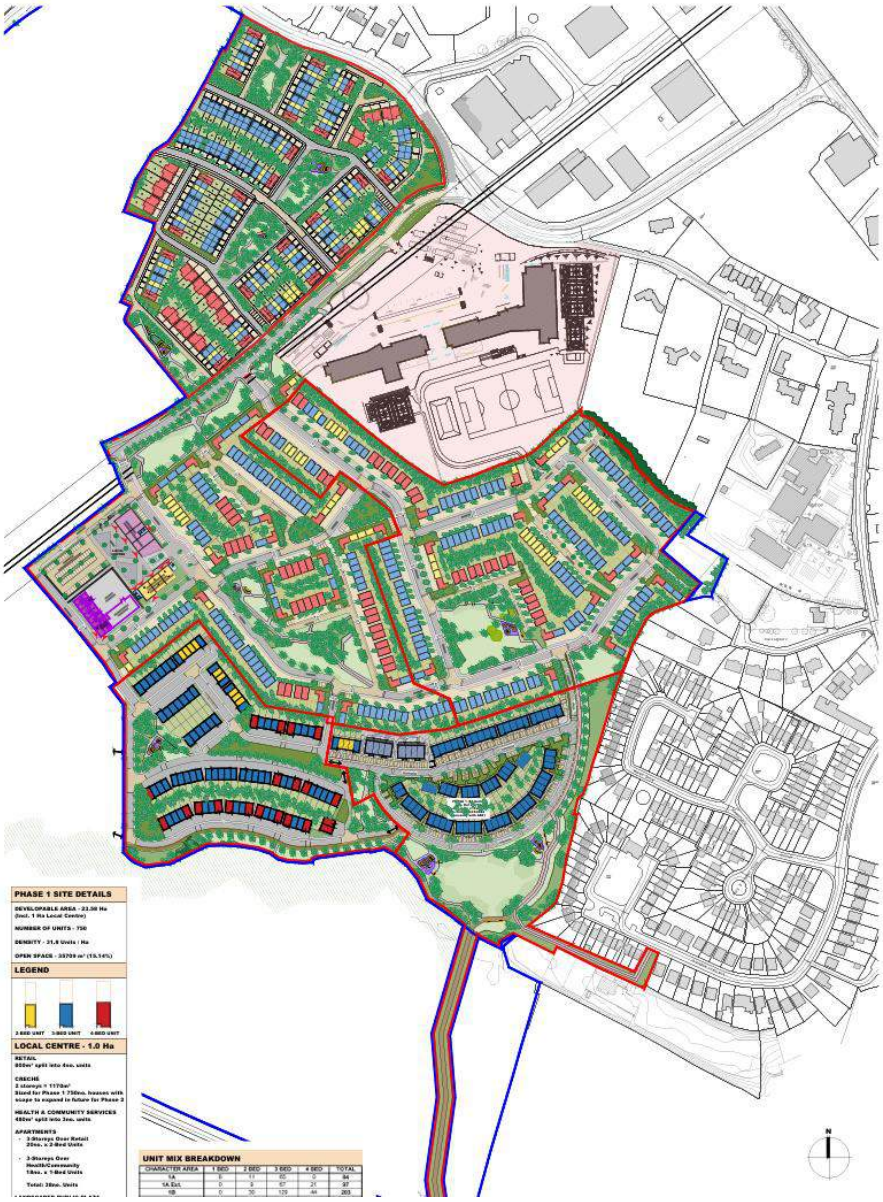


Figure 2.10: Alternative Layout D – S247 Meeting request to Wicklow County Council for a Large-scale Residential Development, Site Layout Plan

This alternative was developed for a Large scale Residential Development S247 meeting with Wicklow County Council. The layout of this proposed development was a reflection of three critical changes in the wider site area:

1. The Arklow Waste Water Treatment Plant, ABP Reg Ref 302556, was under construction, and, at the time of writing this chapter is now completed and operational.
2. The Arklow Flood Relief Works were granted permission under ABP Reg Ref 310368 and includes debris traps within the Avoca River
3. Department of Education had received planning permission for a school campus, including a primary and secondary school under WCC Reg. Ref. 22/213 which included part of the regional link road.
4. A planning application had been submitted for phase 1 of the Character Area 1A and had been granted permission by WCC Reg. Ref. 23/754 but was before An Bord Pleanála awaiting

decision. This provided for 84 no. Residential units, a new pedestrian and cycle link past the Marsh Sports Centre into Avondale Crescent and provided a continuation of the Regional Link Road and the central spine route through the site.

Key fundamental elements established within this proposed development that have been carried forward in all subsequent designs include:

- The incorporation of the farmhouse and buildings in the northern corner.
- The omission of the land swop arrangement and vehicular connection past St Joseph's school to the east. However, provision for this connection in the future was retained.
- Revision to the phase 2 layout to allow for the existing woodland in this location to be retained.

Alternative Layout D Comparison of Environmental effects:

The proposed development provided for 750 no residential units, the regional road and local centre providing 4 no. Units and a two storey creche, along with 3 no. Health/ community units. The proposal also included apartments and houses, along with an allowance for a bus connection through the site .

This proposal was considered to have many significant benefits over the previous layouts, and also reflected permitted development within the immediate areas, including the Waste Water Treatment Plan and the Arklow Flood Relief Scheme. The proposed development also provided for biodiversity improvements as a result of tree and hedgerow retention where possible, improved overlooking of public open spaces, better connections into the future phase 2 development.

Alternative Layout E –LRD Pre application Opinion Meeting Request to Wicklow County Council

Figure 2.11: Alternative Layout E –LRD Pre application Opinion Meeting Request to Wicklow County Council , Overall Masterplan

Figure 2.12: Alternative Layout E –LRD Pre application Opinion Meeting Request to Wicklow County Council , Site Layout Plan

The proposal was developed for a LRD Pre-application Opinion Meeting request following the S247 meeting with Wicklow County Council. The area to the south east was still before An Bord Pleanála awaiting decision. This provided for 84 no. Residential units, a new pedestrian and cycle link past the Marsh Sports Centre into Avondale Crescent and provided a continuation of the Regional Link Road and the central spine route through the site.

The proposed development included for 750 no. Residential units with a mix of houses and apartments, along with public open space, bus route provision, a neighbourhood centre and connections into the wider area via the new vehicular route to the north on the Kilbride Road, the pedestrian and cycle route to the south east via the Marsh Sports Club and Avondale Crescent and a boardwalk to the south across the marsh and Avoca River.

Development Proposal	Statistics
No. of residential units	750 no residential units - 702 Houses comprising: • 72 no. 2 beds • 453 no.3 beds • 177 no.4 beds - 48 Apartments comprising: • 14 no. 1 beds • 28 no. 2 beds • 6 no. 3 beds

Local Centre	- 3 no retail units - 3 no community/medical units - 1 no. creche
Density	31 units per hectare

Key fundamental elements established within this proposed development which have been carried forward in subsequent designs include:

- New boardwalk route across the marsh, on top of the permitted debris traps in the Avoca River, which were granted permission under ABP Reg Ref 310368 and landing on the southern banks of the Avoca River. This provides direct connection to Arklow Main Street, and all associated facilities, including the shops, restaurants, bars, library, HSE buildings and train station.

Alternative Layout E Comparison of Environmental effects:

The proposed development was considered to deliver too low a density, and this should be increased. Other concerns raised related to the protection of the water courses in the vicinity, and the construction methodology for the Boardwalk across the Marsh.

Issues raised by Wicklow County Council included:

- Density of the development should be intensified.
- Phasing of the development in the context of the Local Area Plan and within the development.
- The construction of the Boardwalk and Bridge to ensure the hydrology and ecology of the marsh is protected.
- The unit mix proposed in the development should include greater number of smaller units.
- Impacts on residential amenity for existing residents along with the provision of appropriately designed social and community infrastructure such as a creche and social and affordable housing.
- The need to protect existing watercourses on site and the inclusion of nature-based SUDS measures, along with more detail with regard to flooding and the impact of the bridging works.
- A CEMP and a BEP were both requested to demonstrate the protection of the river and marsh during construction along with the enhancement of the biodiversity of the area as a whole.

Alternative F – Chosen Layout

Figure 2.13: Alternative F – Chosen Layout, Overall Masterplan

Figure 2.14:Alternative F – Chosen Layout, Site layout Plan

The chosen site layout, the subject of this EIAR and associated planning application, reflects and incorporates all of the best aspects of the previous iterations and advice provided by both Wicklow County Council, An Bord Pleanála and the Design Team. The chosen design also excludes the 84 no. Permitted residential units to the south east corner following the grant of permission of this development by Wicklow County Council under Reg. Ref. 23/756 and by An Bord Pleanála under Reg. Ref. 319604 which also included the pedestrian and cycle link past the Marsh sports club, through Avondale.

Therefore, proposed development includes for 666 no. residential units with a mix of houses and apartments, along with public open space, provision for a future bus route connection, a neighbourhood centre and connections into the wider area via the new vehicular route to the north on the Kilbride Road, the pedestrian and cycle route to the south east via the Marsh Sports Club and Avondale Crescent and a boardwalk to the south across the marsh and Avoca River.

Development Proposal	Statistics
No. of residential units	666 no residential units - 578 Houses comprising: • 98 no. 2 beds • 285 no.3 beds • 195 no.4 beds - 88 Apartments comprising: • 24 no. 1 beds • 51 no. 2 beds • 13 no. 3 beds
Local Centre	- 3 no retail units - 3 no community/medical units - 1 no. creche
Density	35 units per hectare

The most significant change in this proposed development was to omit any proposed development within 25m of the existing watercourse to the southeast of the site. The design of the boardwalk was also altered to ensure it could be constructed with minimal impact on either the Avoca River or the marsh, while still fitting in with the permitted Flood Relief works in this area.

Alternative Layout F Comparison of Environmental effects:

The proposed development, while at a higher density than the existing surrounding houses, is at an appropriate density to ensure efficient and best use of this zoned land. This is reflected in the unit mix which now has 13% apartments, an increase from 6%. In addition, the proposal includes for a greater mix of one and two bed apartments and houses, resulting in c. 26% of all ones comprising a smaller unit compared to 15% previously. This allows for a greater choice in unit type for the future population.

As indicated within the phasing diagram, the proposal will deliver all the development in the south east corner, along with the new road and the neighbourhood centre in the initial phases, ensuring appropriate amenities are provided for the future residents of this development at an early stage. The Boardwalk will be delivered as soon as the debris traps are constructed.

A Construction Environmental Management Plan, a Construction Management Plan and a Biodiversity Enhancement Plan are all included with this application to ensure that the development is completed in a sensitive manner reflecting its location across a marsh which is a pNHA and across the Avoca River. This will ensure the protection of the hydrology and ecology in this area.

The layout and design of the proposed development, particularly with regard to the removal of housing from the watercourse along the eastern edge of the site, results in no new dwellings backing directly onto Murell Drive. The layout within the scheme ensures that appropriate distances are maintained between properties and also from new pedestrian and vehicular routes around the site.

This proposal, after a review of all the other iterations, is considered to be the most appropriate for the site. It enhances the many opportunities relating to the site including the retention of existing hedgerows and trees, both in the subject application and within the wider masterplan.

The proposal includes the provision of large areas of public open space, while ensuring appropriate passive surveillance of these spaces. It provides an appropriate transition in heights, massing and density from the lower density development to the south east to the future higher density areas around the proposed neighbourhood centre, close to the new regional road.

Through the boardwalk, along with the design across the site, the proposal provides excellent pedestrian and cyclist connectivity through the site, to the main street, and connecting to the new school campus, while minimising impact on the marsh and river by developing on top of permitted infrastructure in the form of flood relief works.

The proposal also provides a greater mix of unit types, while also protecting existing watercourses on the site. It is therefore fully compliant with all aspects of the AAP3 zoning, the LAP and the Wicklow Development Plan for this site.

2.8 Alternative Processes

This is a residential led mixed use development on greenfield land, zoned as Mixed Use Development, and identified as an Area Action Plan 3, in the Local Area Plan, permitted residential led development. The AAP3 Framework also identifies the requirement for a school, local neighbourhood centre, new regional road, and 1,500 residential units.

The EIA Guidelines state that each design solution should be considered against the different approaches, technology, location, size, and scale of the proposals thereby arriving at the most optimal solution. The evaluation must select the optimal design by comparing the environmental effects generated by each alternative scheme- through energy demand, quantity of materials used, natural resources used etc.

Each design iteration has been assessed with respect to a number of key design elements within the above sections including design response to the existing site context in the location of taller buildings on site; social impact through the unit mix proposed, social infrastructure proposed within scheme; and other functional aspects of the design like car parking provision and functionality of open spaces proposed. This assessment has informed the selection of final design based on the most appropriate approach.

2.9 Summary Table of Alternative Designs and Environmental Impacts

A comparison of the environmental effects of each of these alternative layouts is shown in table 2.5 below. This table compares the operational effects of each alternative on a variety of environmental factors. Each option is compared to the others and are assessed as follows:

- ✓ Is for those that are considered to have a more positive impact than others
- = Where the impact is considered similar for all options
- X Where a particular option is considered to have a more negative impact on a particular aspect of the environment compared to the majority of the others.

It is considered that the chosen design as per this planning application and EIAR in general achieves a better result in terms of impact on the environment than the other design options previously considered.

	A	B	C	D	E	F
Population and Human Health	=	=	=	=	=	=
Biodiversity	=	=	=	✓	✓	✓
Soils and Geology	=	=	=	=	=	=
Hydrology	X	X	X	X	X	✓
Air and Climate	=	=	=	=	=	=
Landscape and Visual	=	=	=	=	=	✓
Noise and Vibration	=	=	=	=	=	=
Traffic and Transportation	=	=	=	✓	✓	✓
Waste Management	=	=	=	=	=	=
Material Assets	=	=	=	=	=	=
Archaeology	=	=	=	=	=	=

Table 2.2: Comparison of effects

The chosen layout provides an attractive development to the north of Arklow. It also provides a new link route and connection to the school campus to the north, along with a new boardwalk to the south of the subject site. The site will enable the delivery of significant further development on lands to the north which will not only benefit the proposed development but also the existing developments in the surrounding areas. Especially in relation to the reservation of lands for a future active recreation to the north, connections to the permitted school campus by foot or bike, and future connection to the Arklow Pyramid to the north of the subject site.

This chosen layout will create a strong sense of place, legibility and permeability, and create a new local attractive public open space for the existing community and local neighbourhood centre for future residents of the development. While at a higher density than the neighbouring surrounding areas the proposed development is in accordance with current national and regional policies for compact urban growth.

In terms of population and human health, it is noted that the key benefits of this development, above the other similar schemes, is the increased provision of creche spaces, a new neighbourhood centre with retail and community uses, new public open space and a new boardwalk connecting into the greenway and the Main Street.

In terms of Biodiversity the retention and enhancement of existing hedgerows and trees where possible, along with the large buffer zone to the ditch, all supplemented with additional planting and SUDs significantly impacts the scheme positively. The connection to the Main Street, and into the permitted developments, connecting the permitted school campus to the town and wider area for those travelling by foot or bike is a significant gain. The increase in planting of native species throughout the development, in conjunction with the open space provision to support a portion of SuDS will result in a significant win in terms of environmental development.

Finally, while many of the iterations are similar to each other due to the prescriptive nature of the AAP3 Framework and the constraints on the site, this proposal is the best interpretation of the AAP3 Framework. It conforms with the Local Area Plan and AAP3 while also reflecting more recent national and local plan policies. It also results in the best use of the land, enhances the biodiversity of the site and is in accordance with the scale and massing of the site, providing appropriate urban streetscape and transitions across the site and connections throughout.

3. Description of Development

3.1 Introduction

This section of the EIAR has been prepared by McGill Planning Ltd. with input from the project design team. The section describes the nature of the proposed development in accordance with the requirements of the relevant EIA legislation and guidance on preparation and content of EIAR.

3.2 Receiving Environment

The site is located in the area of Kilbride on the northern side of the Avoca River in Arklow, Co. Wicklow. It is located within the development boundary of Arklow Town in the townland of Kilbride. The site is on lands zoned mixed use within a larger area designated as Area Action Plan 3 lands in the Arklow and Environs Local Area Plan 2018 – 2024. Wicklow County Council approved an Action Area Plan for Action Area 3 on the 2nd of April 2019.

The development site measures c. 25.07 ha and is zoned for "*mixed use"* with the objective *"to provide for mixed use development"* including 1,500 residential units along with local shops and services. The southern portion of the land are zoned *"Arklow Town Marsh pNHA"* in the Arklow and Environs Local Area Plan 2018 - 2024. The proposed development includes a new pedestrian boardwalk and bridge that traverses the marsh, and will sit atop of the permitted debris traps to be installed as part of the permitted Flood Alleviation Works.

Figure 3.1: Approximate Site Location. Please note the red line is shown for indicative purposes only. Please refer to the architect's drawings for an accurate red line boundary

The site as a whole is currently in agricultural use and slopes in a broadly north / south direction to the town marsh and Avoca River.

The Howard Mausoleum (Pyramid of Arklow0; national monument, and its associated graveyard at Old Kilbride Cemetary are located to the north of the ownership area but at a significant distance outside of the application site and the proposed new road. This Mausoleum has been maintained over the years and is now in the control of Wicklow CoCo. There is also a surrounding external wall around the graveyard which is in varying condition.

There are hedgerows and trees on the site but there are no category A trees within the site. To the south of the site, there is an area within the Arklow Town Marsh pNHA (proposed Natural Heritage Area). This pNHA is a non-statutory designation. There is also a small drainage ditch to the east of the subject site. The site is not located within a Conservation Area or an Architectural Conservation Area.

The immediate area is characterised by a mixture of land uses, primarily residential, educational and industrial. The residential estates of Avondale Crescent, Willow Grove, Murell Drive, Mary B Mitchell Close, Windermere Avenue, Tyronell Close and Carrigmor are to the east of the Area Action Plan lands. St. Joseph's National School is located to the north east of the site, Kilbride Industrial Estate, which accommodates users such as the Glenhaven Foods, Green Treat, Qcom Outsourcing and Arklow HubLink, is located to the north of the Kilbride Road.

3.3 Characteristics of the Proposed Development

The proposed development consists of a Large-Scale Residential Development and planning permission is sought for a period of seven years. The proposed development is for a residential scheme on a site with an area of c. 25.07 (gross) hectares/ 18.93 hectares (net) at Kilbride, Arklow, County Wicklow.

The proposal is for a vibrant new residential scheme that prioritises the health and wellbeing of residents by providing a high-quality public realm area for residents to enjoy, exercise and socialise in. This strategically located site is prioritised for mixed-use development including residential use and is an optimal location on which to deliver a quality housing scheme that can respond to the ongoing demand for homes in Wicklow.

The development description as set out in the statutory notices is below:

> ***The development will consist of the demolition of 3 no. structures on site including a 2-storey habitable house (total GFA 207 sq.m) and 2 no. sheds/outbuildings (c.580 sq.m). Closures of 2 no. existing entrances onto the Kilbride Road (L-6179). Construction of a new residential development and local centre comprising: 666 no. units (578 no. semi-detached and terraced housing (100 no. 2 beds, 317 no. 3 beds, 161 no. 4 beds) and 88 no. apartments and duplex apartments (24 no. 1 beds, 51 no. 2 beds and 13 no. 3 beds)). All residential units will have associated private open space facing north/ south/ east/ west. The proposal will also include a local centre (c. 2335 sq.m) comprising a creche (c.1,095sqm) with outdoor play area, 3 no. community/medical units (c.450 sq.m), and 3 no. retail units (c.790sq.m). Building heights within the development will range from one to five storeys.***

The development will include streets, pedestrian/cycle links, open spaces/parks (with play areas) and will include amendments to the permitted open spaces and access road granted as part of the Phase 1/Character Area 1a development (WCC Reg. Ref.: 23/756 on the subject lands.

The development will also include a public boardwalk/bridge for pedestrians and cyclists from the development across Arklow Town Marsh and the Avoca River to the Arklow Riverwalk north of Arklow Town Car Park and the Town Centre, with the bridge element (and associated works) across the Avoca River constructed atop the concrete columns (debris traps) permitted as part of the Arklow Flood Relief Scheme (Planning Ref. ABP-310368-21).

All associated site development works, site reprofiling, infrastructural and drainage works, surface water attenuation and natural attenuation areas, connection to public services and utilities (including undergrounding of ESB lines), provision of substations, bin stores, bicycle stores, car and cycle parking at surface and undercroft levels, public lighting, landscaping and planting, public/communal/private open spaces and boundary treatment works. This development will form part of the designated Kilbride Action Area Plan AAP3.

Action Area Plan 3 Masterplan

The subject site is located on lands zoned mixed use within a larger area designated as Action Area Plan 3 in the Arklow and Environs Local Area Plan 2018-2024. The Overall Masterplan for the site will deliver 1500 residential units in a variety of formats in accordance with the requirements of the Local Area Plan and Action Area 3 plan. The Masterplan includes:

- Delivery of 1500 residential units in a variety of formats and sizes to cater for a wide range of occupiers
- School site for 2 new schools at the northern site boundary with the Kilbride Road L-6179 (granted under a separate planning permission ref 22/213
- The new strategic road infrastructure which will connect the Kilbride Road L-6179 through the site to the western end of Arklow town via a new bridge.
- The Local Services Centre which will provide creche, retail and local services at the centre of the masterplan.
- A series of parks and landscaped spaces throughout the plan within easy walking distance of all residential units
- Active open space / sport use lands located along the western boundary of the site beside the M11
- A landscaped buffer zone at the southern edge of the development to engage with the town marsh in an appropriate manner.
- Two separate pedestrian / cycle connections located in south eastern corner of the site which link the proposed pedestrian and cycle network within the subject application to Arklow town
- A landscaped buffer zone around the Pyramid and associated graveyard to enhance its setting

The current proposal is to bring forward the site in two phases. The first phase of development, the subject of this pre-application consultation request, will complete the first part of the new distributor

road and access into the site along with 666 residential units on the site, the neighbourhood centre and a new pedestrian / cyclist access through the Arklow Town Marsh, and public open spaces. Phase 2 will deliver the remaining 750 no. residential units along with the sports facilities and the remainder of the road. To the south of the site, 84 units have previously been permitted under WCC. Reg. Ref. 23/756 within the action area lands. This application includes a secondary pedestrian / cyclist connection to Arklow Town via Avondale Crescent.

Figure 3.2 Overall Masterplan Area

Residential

The proposed development is to build 666 no. residential units and will comprise of 578 no. houses and 88 no. apartments and duplex apartments. The breakdown of the mix of units will include:

Table 3.1: Breakdown of the Mix of Units

Unit Type	Unit Size	No. of Units	Percentage
Houses	2 bed	98	17%
	3 bed	285	49%
	4 bed	195	34%
Total Houses		**578**	**100%**
Apartments	1 bed	24	27%
	2 bed	51	58%

	3 bed	13	15%
Total Apartments		**88**	**100%**

The total unit mix breakdown for the entire development is as follows:

Unit Size	No. of Units	Percentage
1 Bed	24	4%
2 Bed	149	22%
3 Bed	298	45%
4 Bed	195	29%
Total	**666**	**100%**

To provide a sense of place, enable visual diversity and create distinct housing estates, 3 separate architects have been employed to design 4 separate character areas.

Character area 1A is located to the south of the masterplan area and is the lowest lying of all the areas. This area is influenced by both its proximity to Arklow Marsh pNHA, and Arklow town centre. This area takes advantage of its location beside the marsh, which is a valuable and attractive ecological amenity and provides an attractive area to visit and observe. It is abutting the existing residential area of Avondale, Murell Drive and the existing sports grounds. It fronts onto the marsh and provides the pedestrian link to the boardwalk travelling to the south, crossing the Avoca river. Character area A will contain 93 no. Residential units along with a new park. A variety of house types and architectural treatments have been proposed throughout this character area including terraces and semi-detached houses, along with a range of materials, in order to provide legibility within this area. The public open space has been laid out to create a green link through the site, with pedestrian routes leading to the proposed public park to the south of this phase and also linking into other public spaces in subsequent character areas.

Character area B is located at the north east of the site and abuts St Jospeh's National school, Murell Drive to the east and to the north of the character area B is the permitted new school campus. This site is accessed via the proposed distributor road. This second phase of development will deliver 205no. two storey houses and a central open space. A network of linked open spaces have been created to provide a pleasant, pedestrian green environment to move through. Priority has been given to pedestrian and cyclist to encourage their movement through the site. As with character area A, a range of house types, architectural treatments and material palette have been used to create a sense of place and definition within each of the small areas within the character area.

Character area C is located at the heart of the development to the south of the proposed distributor road and west of area A. This area will have the Local Area Centre which will include amenities such as a crèche and three retail units and three community/ health care units. This area will also provide 201 no. residential units made up of apartments/ duplexes and two storey houses. As part of the development of the Local Area Centre a village square and associated village green is proposed, creating a destination location which could have pop up markets/ events within the area. This area is characterised by storey heights ranging from two to five storey buildings which create a sense of place and enclosures to the spaces. The higher buildings will enable a clear differentiation and legibility from the previous two character area.

Character area D is the most northern area to come forward. It faces onto the Kilbride Road with tis associated houses and industrial estate. It is the site which is nearest the Pyramid of Arklow and a key aim of this area is to maintain views of this important heritage site, and also provide access links to it. This phase of development has the added complexity of addressing the proposed distributor road and as such, the houses have been orientated to ensure that they address this road in order to provide it with a strong urban edge. The units along these roads have also been arranged to provide an appropriate relationship with the road for residential housing. A key element of this site is to maintain and improve views of the Pyramid of Arklow which has been developed by the creation of an axial relationship between the heritage site, Character area A and Arklow town beyond.

The area will provide 167 no. residential units along with a series of open spaces throughout the area all of which are overlooked. This also prioritises the movement of pedestrians and cyclists around the area and down into the town centre. The proposed park also provides further routes which will connect into future walks in the area and into phase 2 of the development. As with character area A, B and C, a range of house types, architectural treatments and material palette have been used to create a sense of place and definition within each of the small areas within the character area.

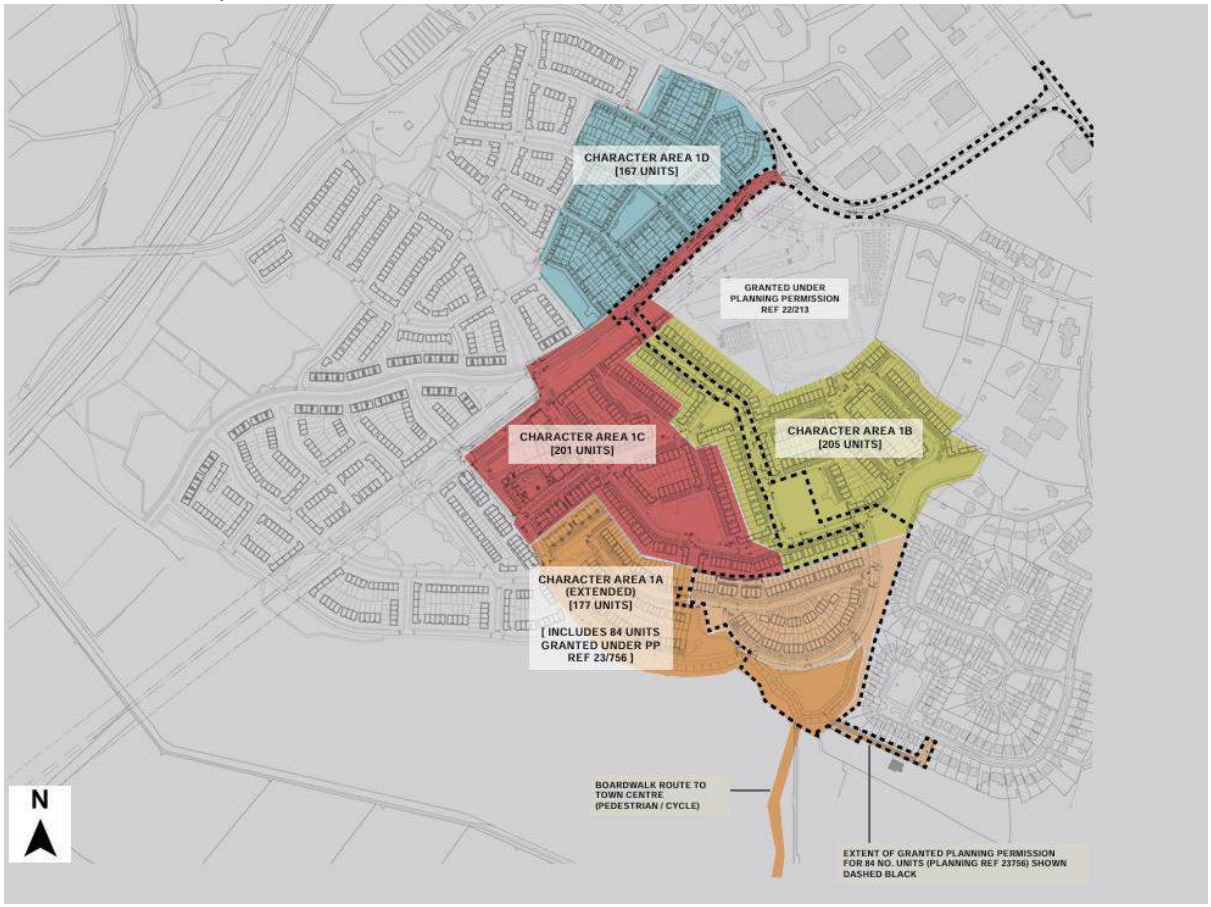


Figure 3.2: Character Areas Proposed for this Large-Scale Residential Development

Boardwalk / Bridge

A pedestrian and cycle connection to Arklow Town Centre is proposed via a boardwalk connection - entering / exiting via the south of the subject application area. The Boardwalk will cross Arklow Town Marsh pNHA. On reaching the Avoca River the boardwalk will then become a bridge spanning the Avoca River. This pedestrian/cyclist bridge will be positioned on top of the already permitted "debris

and gravel traps" that are to be constructed across the river in accordance with the Arklow Flood Relief Scheme that was granted by An Bord Pleanála (ABP-310368-21) on the 19th of July 2022.

The c.4m high and c. 1.6m wide debris trap columns (with a c.3.4m separation between each column) are to traverse the Avoca River c.300m upstream of the 19 Arches Bridge.

The permitted debris and gravel traps have already been thoroughly assessed as part of the Flood Relief EIAR and NIS. Given this comprehensive evaluation, it is considered that the addition of the bridge on top of the columns and over the river will have minimal additional environmental effects.

Figure 3.3 Artists view of the boardwalk

It will create a direct, and "off-road" sustainable transport route to Arklow town centre for existing and future residents north of the River, and in turn will provide a viable alternative to the 19 arches bridge for sustainable transport, particularly in relation to the need for cycleway provision given the limited potential to improve these facilities on the heavily trafficked bridge. It will directly link the subject development on the AAP3 lands to Arklow town centre. As a result, the town centre will only be c.600 metres away.

The route will also open up safe access to Arklow Marsh as a key amenity for the wider Arklow community north and south of the river and will integrate with the Greenway along the Avoca River to run to Shillelagh.

Local Centre

The Local Centre will be located within the heart of the development and will provide a creche, retail and local services in three separate buildings arranged around a central plaza along with 32 no. apartments / duplexes at upper flood levels. This is in accordance with the Local Area Plan and Action Area Plan 3.

As the steeply sloping nature of the site gives rise to varying ground floor levels across the three buildings, the provision of a central level-access plaza serves to accommodate the public entrances to the crèche, retail/café & health/community local services all at one level to maximize accessibility.

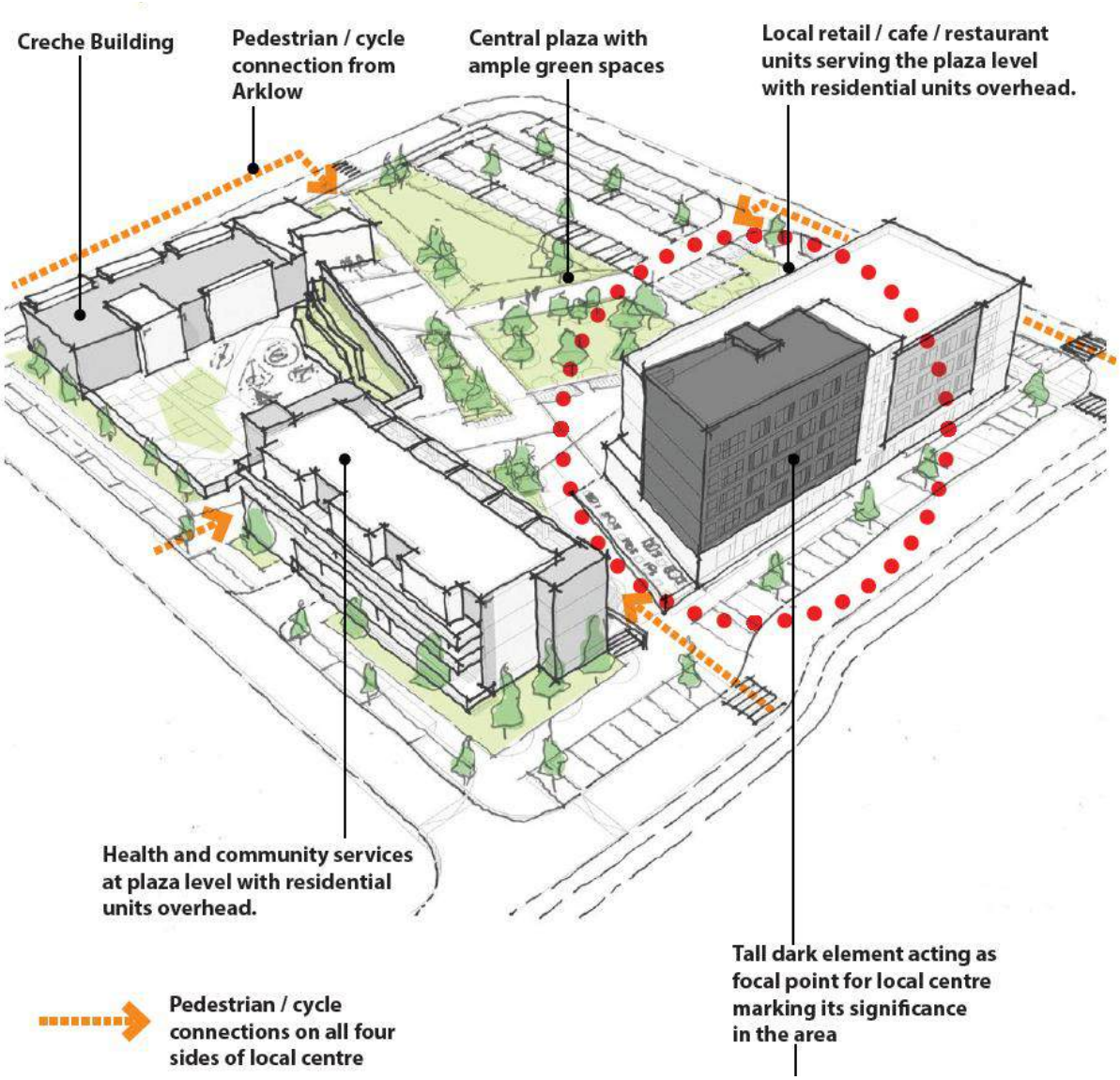


Figure 3.4 Extract from BKD Design Statement indicating the neighbourhood centre

The retail building includes 790m² of retail space at ground floor level split into 3no. units fronting onto the plaza. Primary access to the units is located on the Southwest & Southeast façades. Above this sits three storeys of 8no. apartments each plus a top story of 2 no. apartments. The apartments in this building include 26 no. 2-bed units in a variety of sizes & orientations.

The local services building provides 450m² of health & community use space split into 3no. units fronting onto the plaza at ground floor level, with 12 no. 1-bed apartments above. Lower ground floor contains a car park & ancillary spaces for staff & residents, with direct access to the stair/lift core connecting to the health/community units and residential floors above. A further entrance is located at ground floor level providing a direct connection for residents onto the central public plaza.

The crèche building provides 1095m² over two storeys along with a landscaped playground and is sized to serve the 750no. units of Phase 1, with 20no. 10-child classrooms for a total capacity of 200.

New Distributor Road

The proposal incorporates one main shared access route for vehicles into the site via a new distributor road alignment which will connect the Kilbride Road L-6179 through the site. It is envisaged that in the future the distributor road may extend to the western end of Arklow town south of the Avoca River via a new bridge (subject to future application and public funding).

Level Changes

The site topography in level varies between +37.800m AOD and +1.500 AOD, and slopes from North to South. A number of design solutions have been incorporated into the proposal to address changes in level across the site.

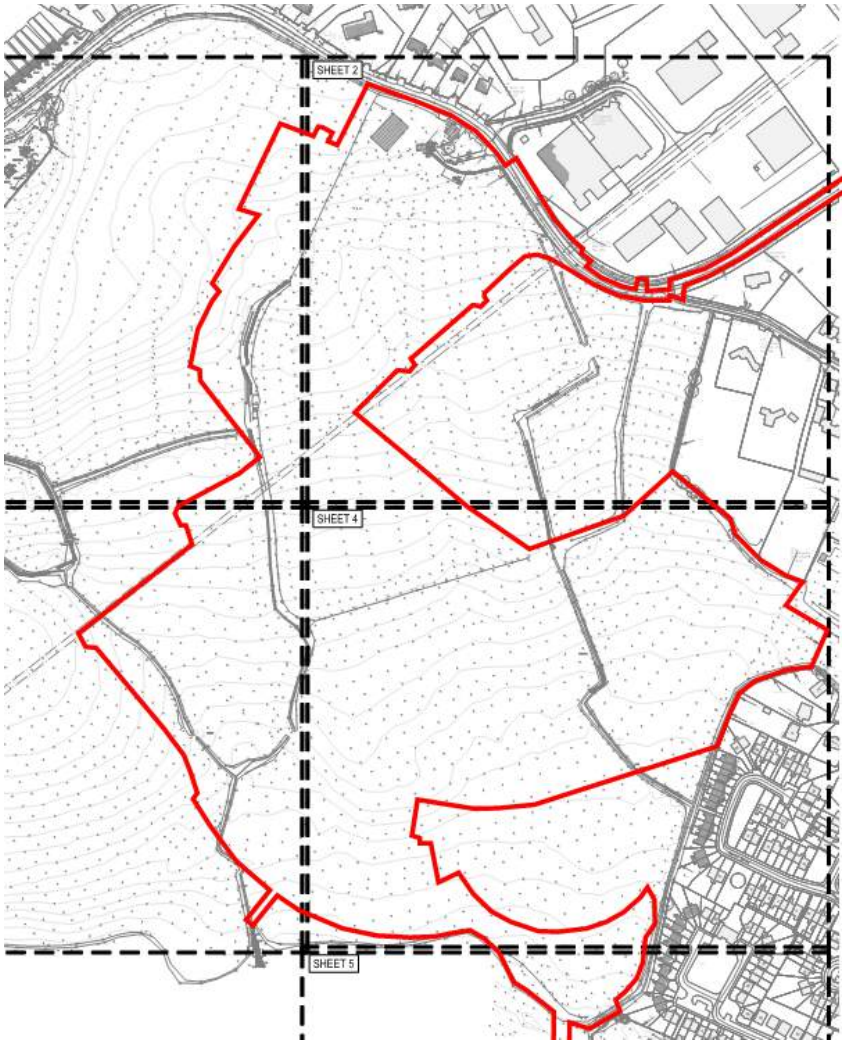


Figure 3.5 Phase 1 site area

Water Services/ Utilities

The site will use bioretention basins as part of a nature-based Sustainable Drainage System (SuDS) to manage surface water runoff from roofs and paved areas, where possible. These basins are designed to hold water safely, maintaining at least 300mm of freeboard (space between water level and the surrounding ground or road) and at least 500mm of freeboard to the finished floor levels of nearby buildings.

The bioretention ponds will have wetland-style edges that help to both slow down and treat surface water. They will also support aquatic plants, enhancing the existing landscape and biodiversity on the site.

These retention basins are located in green spaces where the site's landscape can be shaped to maximise their use. Surface water will already have passed through various treatment measures – such as tree pits, bioretention areas, permeable paving, and filtration systems – positioned near buildings and hard surfaces around the site.

Around the edges of the ponds, dense wetland vegetation will be planted. This helps trap pollutants, supports natural breakdown processes, manages sediment, and prevents it from being stirred up again.

Because parts of the site are sloped, additional underground storage will be used to manage surface water. This will consist of Stormtech (or similar) arched chambers surrounded by stone to allow water to flow through.

The proposed development as part of this LRD Application Submission shall be served by a 300mm dia HDPE watermain which shall connect/ extend from an upgraded 300mm dia. HDPE along Monument Lane as part of the Uisce Eireann upgrade Works and will be delivered by others. This proposed 300mm dia ID watermain has been designed to account for the future masterplan development and has also been fully coordinated with the granted school campus development.

Open Space and Planting

The landscape proposals for the scheme includes 41,981sqm of public open space. The Public Open Space (POS) is delivered in the form of pocket parks in each of the character areas. The spaces will be delivered in line with current design and taking in charge standards, creating SUDs features, informal play, exercise and seating opportunities with an abundance of tree planting, shrubs and wild flower areas to support localised biodiversity needs and requirements. The woodland corridor and village green will provide points whereby the neighbourhood can interact and gather to create a genuine sense of community as has been documented with great success across developments of similar scale.

The proposed development provides a series of parks and landscaped spaces throughout the plan within easy walking distance of all residential units. Each area is distinctive and reflects the character of the area which it is located within. Key influencing factors in the scheme includes the natural constraints of the site in terms of the Arklow town marshlands, mature trees and the topography of the site. This has helped to form a series of public and communal open spaces with attractive features which profiles high amenity value.

The proposed development includes 379sqm of Communal Open Space located between the Duplexes in Character Area C and Character Area 1A.

Site Development Works

The proposal includes a range of associated site development works, drainage and infrastructural works, servicing (including substations, bin stores), landscaping, open spaces, and boundary treatment works.

The proposed development includes upgrade works to the existing L-6179 road to the north of the site creating a junction onto the main access road to the site.

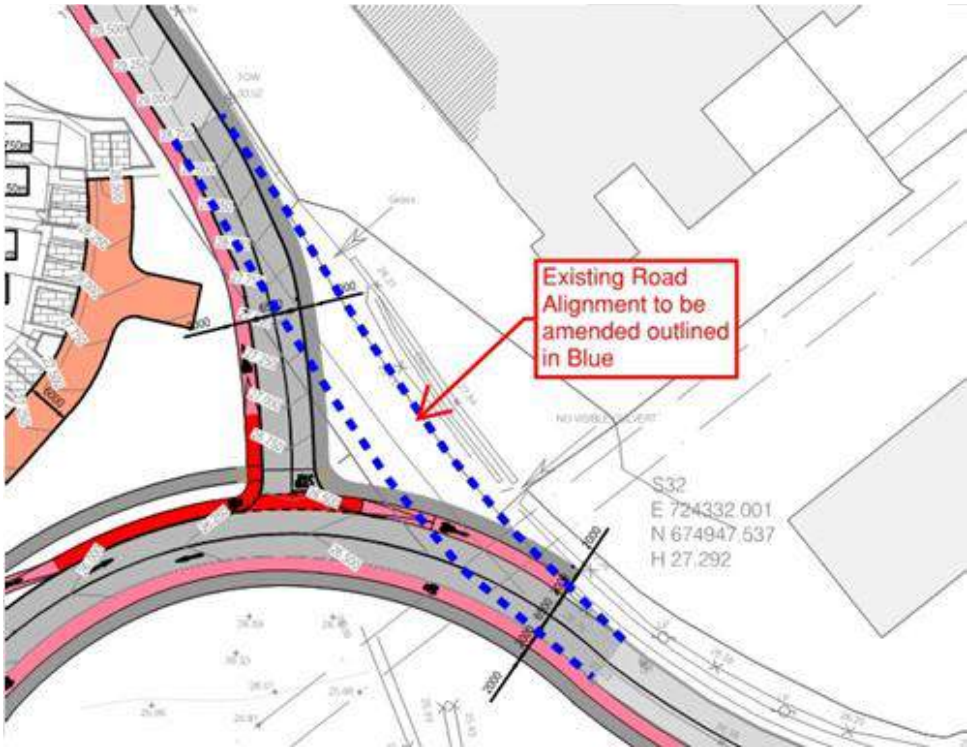


Figure 3.6:Junction 3 - proposed junction and road realignment of the L-6179

It is proposed to extend the existing footpath and cycle path on the northern edge of the L-6179 toward the junction and provide a crossing point to the southern infrastructure to improve safety on the VRU infrastructure. The image below indicates the existing and proposed junction arrangements of the L-6179 Beech Road Junction.

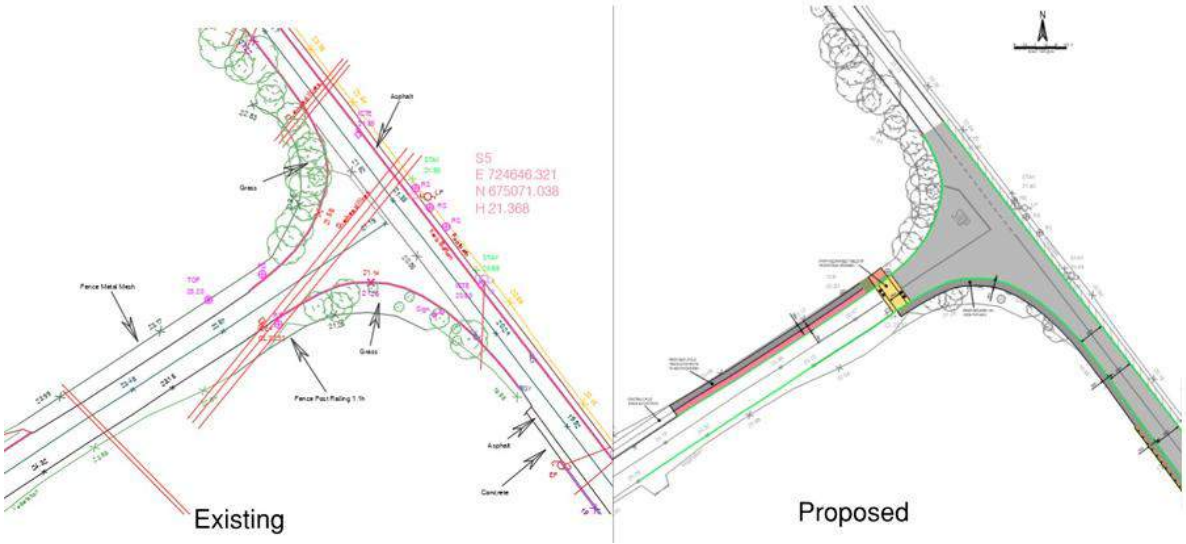


Figure 3.7 Existing and proposed Beech Road Junction upgrade works.

Furthermore, as part of subject development works to cater for the proposed residential development, it is proposed to incorporate a left- and right-hand signalised turning lane onto the R772. The proposed arrangement will allow for sufficient queuing lengths to and from the proposed development.

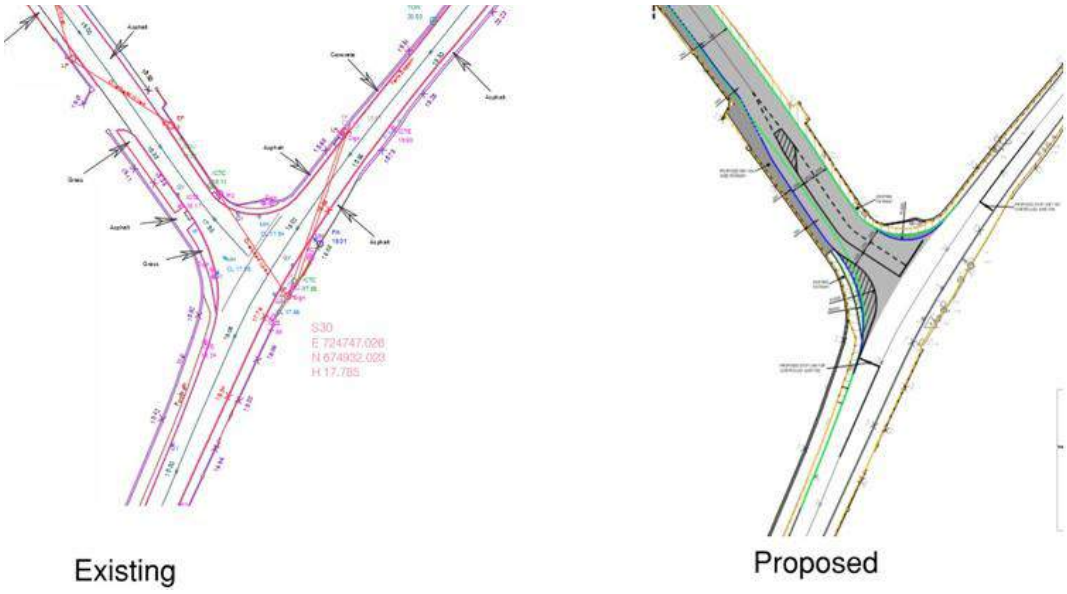


Figure 3.8 Existing and proposed Beech Road Junction upgrade works.

Layout and Design

Figure 3.9: Final Site Layout Plan (Source: BKD Architects, 2025)

The design approach for the scheme is directly influenced by the application of the Action Area Plan objectives and the physical characteristics of the subject site. A number of urban design considerations have been addressed within this proposed development such as:

- The establishment of a curving architectural boundary to offer views over the encompassing marsh.
- The permeable and legible layout of the street network and open spaces creating desire lines to the local facilities, schools and the boardwalk.
- Continuous and active edges provides enclosure and passive surveillance contributing to the comfort of pedestrians and cyclists.
- The road network has been designed to calm traffic speeds by utilising DMURS as a guiding reference.

The scheme consists of buildings ranging from 2-5 storeys in height. The natural topography of the site slopes from north to south towards the marshlands. This variation in height will maintain views across the site, while blending into the existing houses within the vicinity. The height is provided within the local centre in order to create a local marker/ legibility for visitors to the area.

The design has appropriate regard to each of these criteria and seeks to create a vibrant new neighbourhood with a strong emphasis on place making and provision of residential amenity.

Access and Parking

The proposed scheme provides 1,185 no. Car parking spaces. Of these, 1,126 no. car parking spaces are residential, this includes 1.80 space per dwelling for the houses and 0.99spaces per dwelling for the apartments. EV Charging for 20% of the car parking spaces is also provided with cabling provided for all other spaces. 20% of the public car parking spaces has also been designated as EV charging.

In terms of bicycle parking, all houses will have their own bike storage within their curtilage. For apartments and duplexes there will be bike stores provided.

Vehicular access is proposed from the Kilbride Road L-6179 along the northern boundary and will tie in with the proposed design permitted for the Kilbride Educational Campus. This road will provide pedestrian and cyclist facilities the entire way down through the site, out to the Dublin Road. This will enable an alternative route for future pupils of the school from Arklow Town which has dedicated pedestrian and cycle links, which is a significant benefit to the school site as well as the subject application.

The 84-unit scheme (WCC Reg. Ref. 23/745) to the south east of the site provides a pedestrian / cyclist access through to the R772 Dublin Road, via Avondale Crescent. The proposed Boardwalk will also provides a new pedestrian/cyclist access to Arklow Main Street.

3.4 Predicted Impacts and Mitigation Measures

Construction Phase

This section of the EIAR summarises the construction of the proposed development. The Construction and Environmental Management Plan submitted separately in the planning application, and the Resource and Waste Management Plan should also be consulted.

Hoarding, Site Set-up and Formation of Site Access/Egress

The contractor shall be responsible for overall management of the site for the duration of the proposed works and will progress their works with reasonable skill, care, diligence and to proactively manage the works in a manner most likely to ensure the safety and welfare of those carrying out construction works.

The first activity to be carried out at the site will be the establishment of site facilities and security. It is anticipated that site establishment works will take approximately four weeks. The site office and welfare facilities will be confirmed in advance of the commencement of site works and agreed with Wicklow County Council.

All areas of construction will be fenced / hoarded off to prevent unauthorised access. This fencing shall remain closed at all times during construction works and closed and locked after construction work hours/break times. This fencing shall be erected in accordance with good practice and the Construction Regulations 2013. Fencing arrangements shall be reviewed as the life of the project progresses.

Access/Egress to site for site operatives and visitors shall be via biometric gates. Site security fencing/ Hoarding up to a height of 2.4 M will be erected in line with the Construction Regulations 2013 that

will clearly separate the work site from the surrounding public. It is not envisaged that the fencing will impinge upon the safe passage of pedestrians during the construction phase.

Site Clearance

The development will result in the removal of some of the existing vegetation and soil. However, any of the high-quality trees will be retained and root protection barriers will be put in place to ensure their safety.

A Construction and Environmental Management Plan has been prepared and submitted with this application and will guide the site clearance.

Construction Traffic and Site Access

The proposed construction vehicle routes for the site will require a traffic management plan to be agreed upon with WCC prior to site workings beginning. Two-way traffic will be maintained throughout the project. Advanced warning signs will be placed at sufficient distances to taper off the entry and exit points. Pedestrian marshals will be used as and when required. Traffic management will be undertaken for the site works in accordance with the principles outlined below and shall comply at all times with the requirements of:

- Department of Transport Traffic Signs Manual 2010 – Chapter 8 Temporary Traffic Measures and Signs for Roadworks
- Department of Transport Guidance for the Control and Management of Traffic at Road Works (2010)
- Any additional requirements detailed in Design Manual for Urban Roads & Streets (DMURS)

Construction traffic operation would be limited to 0800 to 1800 from Monday to Friday and 0800 to 1400 on Saturday for the off-road construction. These times may vary to facilitate specific site requirements and/or construction activities associated with the site. Any variation will be discussed and agreed in advance with FCC.

Car Parking Arrangements

Parking of construction workers vehicles will be limited to the site within the site compound. To minimise congestion, a Construction Traffic Management Plan will be developed by the Contractor to ensure that construction workers access the site using alternative means of transport (i.e. public transport) to negate/minimise any impacts on the local network. This Construction Traffic Management Plan will be developed in line with the mitigation measures outlined in the CEMP submitted with this application and the mitigation measures in Chapter 10 of this EIAR.

Working Hours & Staff

Site development and building works will only be carried out between the hours of 0800 to 1800 Mondays to Fridays inclusive and between 0800 and 1400 hours on Saturdays There will be no construction works carried out on Sundays or public holidays. Deviation from these times will only take place when written approval is granted by WCC in exceptional circumstances.

Lighting

Construction work will generally be confined to daylight hours and lighting will generally not be required for the construction phase. There will however be occasions where the provision of portable lighting will be required (works on roadways and power floating floors as examples). Where possible and without jeopardising site safety lights will be pointed down at a 45-degree angle and away from sensitive receptors. The site compound will have external lights for safety and security. These lights will be pointed down at a 45-degree angle and away from sensitive receptors where possible. All construction lighting will be turned off each evening and at weekends to reduce the potential impact.

Deliveries

Material deliveries and collections from site will be planned, scheduled and staggered to avoid any unnecessary build-up of construction works related traffic.

Deliveries to site shall be booked in advance using a delivery schedule, so as to prevent lorry congestion on the road networks surrounding the site. Alternative safe routeways shall be established for traffic and pedestrians where existing routeways have to be altered, removed or worked on during the project.

Disposal of water, wastewater and sewage

Run-off into excavations/earthworks cannot be prevented entirely and is largely a function of prevailing weather conditions. Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts. All run-off will be prevented from directly entering into any water courses as no construction will be undertaken directly adjacent to open water.

No significant dewatering will be required during the construction phase which would result in the localised lowering of the water table. There may be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavation is kept relatively dry.

Air Quality

There is the potential for a number of emissions to the atmosphere during the construction stage of the project. In particular, activities may generate quantities of dust. Construction vehicles, generators etc., will also give rise to some exhaust emissions. Vehicular movements to and from the site will make use of existing roads.

The potential for dust to be emitted depends on the type of activity being carried out in conjunction with environmental factors including levels of rainfall, wind speeds and wind direction. The potential for impact from dust depends on the distance to potentially sensitive locations and whether the wind can carry the dust to these locations. The majority of any dust produced will be deposited close to the potential source and any impacts from dust deposition will typically be within several hundred metres of the construction area.

In order to ensure that no dust nuisance occurs, a series of measures are proposed under the Chapter 9, the Dust Minimisation Plan in Appendix 9.2 and the CEMP accompanying the application. Hard

surface roads shall be swept to remove mud and aggregate materials from their surface. Furthermore, where the likelihood of windblown fugitive dust emissions is high and during dry weather conditions, dusty site surfaces will be sprayed by a mobile tanker bowser. Vehicles delivering material with dust potential both on and off the site shall be covered with tarpaulin to ensure minimise dust emissions.

All vehicles exiting the site shall make use of a wheel wash facility, if required, prior to entering onto public roads, to ensure mud and other wastes are not tracked onto public roads. Material handling systems and site stockpiling of materials shall be designed and laid out to minimise exposure to wind. Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods.

The Dust Minimisation Plan shall be implemented as outlined in Chapter 9 and Appendix 9.2 of this EIAR and reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust.

Further information on the dust minimisation plan is included in Chapter 9.

Operational Phase

It is anticipated that the primary direct significant environmental effects will arise during the construction stage. Once the development is completed, and mitigation measures employed, it is expected to operate without creating any significant additional environmental impacts. The range of anticipated activities, materials/natural resources used, effects/emissions are not expected to result in a significant impact on the constituent environmental factors. The primary likely and significant environmental impacts of the operation of the proposed development are fully addressed in the EIAR document; and relate to Population and Human Health, Landscape and Visual Impact and Noise and Air impacts associated with the traffic generated. There is also the potential for cumulative, secondary and indirect impacts (for instance traffic) but are unlikely to be significant and have been addressed in the EIAR.

The proposed development at operational stage will be predominantly a residential development with a creche. The expected use of energy and water would be in line with normal household uses. This is the same situation for the creche operation. There is no single use proposed that has an excessive or unusual demand in terms of energy and water as a result of this development. Once the development is completed and is operational there will be no additional uses of the material or natural resources such as land or soil. The biodiversity of the site will be improved due to the new landscaping proposed as part of the development.

3.5 Changes, Secondary Developments and Potential Cumulative Impacts

The potential for the specific proposed development as described to grow is considered to be limited within the residential area. The potential for apartments and duplex units to expand or increase in scale is limited to the confines of the permission sought and new planning permission will be required for further extensions to the blocks proposed.

The houses could have an extension to the rear or an attic conversion. If there was an extension to the rear proposed it could potentially decrease the garden area/private amenity space for residents/homeowners.

The potential for an increase in childcare facilities within blocks would also be subject to further planning permissions.

This planning application is for the provision of 666 units, or the first phase, of the overall residential provision for the AAP. The remaining development, comprising Phase 2, will be brought forward under a separate planning application and will be accompanied by its own EIAR.

Committed Developments within the Wider Area

The completion and current developments within the wider area are noted in the table below.

Table 3.2: Completion and Current Developments within the wider area

Planning Application Details		Development Description
Planning Reference	22213	construction of a new educational campus and a new link road that will service the school campus which will include the provision of two school buildings. Gaelscoil an Imbhir Mhóir a two-storey, 16 classrooms primary school with two special needs rooms and ancillary spaces with total floor of circa 3093sqm serving 480 pupils. Gaelshólaiste na Mara a three-storey, post primary school with two special needs rooms, PE hall and ancillary spaces with a total floor area of circa 6585sqm serving 400 pupils. Proposed site works to include the construction of all new hard play areas, six play-courts, grass pitch, 182 no. car-parking spaces together with boundary treatment, 79 bicycle stands, ancillary infrastructure works, pedestrian links and landscaping.
Status	Granted	
Location	Kilbride Educational Campus, Kilbride,	
Planning Reference	ABP 302556 18	Construction of a new wastewater treatment plant, interceptor sewers including storm water overflows and stormwater storage, sea outfall pipelines, and an upgrade to a section of the coastal revetment all in the townlands of Arklow, Tinahask Lower and Ferrybank, County Wicklow.
Status	Granted	
Location	Arklow, Co. Wicklow	
Planning Reference	24325	a 7-year permission for a Large-Scale Residential Development. The proposed development will consist of the following: Construction of 476 no. residential units, Communal open space and public open space in the form of 13 no. local parks. Provision of 930 no. car parking spaces, 400 no. bicycle parking spaces for residents and 37 no. visitor bicycle parking spaces. Construction of a three-storey mixed use building which will consist of 2 no.
Status	Granted	
Location		

		Retail units at ground floor level, a community centre and office space at first floor level and the previously mentioned 2 no. two bed-bedroom apartment and 2 no. three bedroom at second floor level. 48 no. car parking spaces & 20 bicycle parking spaces are also proposed for this building. Construction of a two storey Childcare Facility. Temporary upgrade works to the existing Railway bridge to facilitate vehicular access to the proposed development. Construction of part of the Port Access Road, with a temporary junction at its Junction/connection with the proposed northern arterial route/link road including pedestrian and cycle paths, and traffic calming measures. The provision of vehicular access, internal roads, pedestrian and cycle paths to the Community and Education lands. All associated site development works, services provision, infrastructural and drainage works, surface water attenuation & natural attenuation systems, connection to public services and utilities, provision of ESB substations, bin stores, bicycle stores, car parking, public lighting, landscaping, open spaces, and boundary treatment works
Planning Reference	23756	84 no. residential units with a mix of detached, semi-detached, terraced houses and duplex apartments ranging in height from 2 to 3 storeys; comprising of 8 no. 1-bed and 8 no. 2-bed duplex apartments, 10 no. 2-bed houses and 60 no. 3-bed houses; all residential units will have associated private open spaces facing north/south/east/west; alterations to Kilbride Road (L6179) to provide a section of the new road into the wider Kilbride Masterplan lands with vehicular, pedestrian and cycle access provided; a new dedicated pedestrian and cyclist access will also be provided to the south-east of the development connecting via the Marshland's sports club lands, and through Avondale Crescent to the Dublin Road; landscaping, public open spaces and all associated site development works to enable the development including boundary treatments, attenuation storage area and other service provision
Status	Granted	
Location	Lands at Kilbride, Arklow, Co. Wicklow	
Planning Reference	2484	demolition of existing derelict buildings (1292 sqm); construction of 99 residential units
Status	Granted	

Location	Upper Main Street, Arklow, Co. Wicklow	comprising 59 no. apartments with four blocks, ranging in height from 4 to 7 storeys (7 no. 1 bed units, 42 no. 2 bed units and 10 no. 3 bed units) and 40 no. 3 storey houses (20 no. 4 bed units); construction of a 350 sqm mixed use building of four storeys containing 350 sqm of retail space at ground floor and residential units above; refurbishment, extension and change of use from a derelict two storey house to a 146.3 sqm creche; refurbishment of the former Ormonde Cinema (Record of Protected Structure Ref. A39) for commercial use comprising 322.5 sqm office at first floor and 32 sqm office, 181 sqm lounge/café and 59 sqm café uses at ground floor; relocation of a Victorian letterbox (Record of Protected Structure Ref. A40) within the scheme; provision of public open space including a new amphitheatre, a new plaza, communal and private open space; provision of internal access roads with vehicular, pedestrian and cyclist access and new vehicular access onto Upper Main Street; 169 no. car parking spaces and 196 no. bicycle parking spaces provided at basement and surface level; realignment of Coomie Lane to create a new pedestrian links between Vale Road, Upper Main Street and the River Avoca walkway; all associated and ancillary site development works above and below ground, including signage, 2 no. ESB substations, alteration to existing landscape features, play area, sculpture, retaining walls, clearance works, landscaping, excavation, bin stores, boundary treatments and services provision
Planning Reference	24352	Part 8 - to construct 74 No. Social Housing Units and all associated works. The accommodation shall consist of the following: 2 No. four bedroom storey and a half units, 17 No. three bedroom two storey units, 45 No. two bedroom two storey units, 2 No. one bedroom apartments in a two storey unit and 8 No. one bedroom single storey units.
Status	Granted	
Location	Tinahask, Townland of Tinahask Upper, Arklow, Co. Wicklow	
Planning Reference	2460284	Discount Foodstore Supermarket with ancillary off-licence sales on an extended site. The proposed development comprises: 1) The demolition of existing single storey Discount Foodstore (with ancillary off-licence use) measuring c. 1,357 sqm gross floor space with a net retail sales area of c. 985 sqm; 2) The demolition of existing 1 no. two storey and 2 no.
Status	Granted	
Location	Lidl, Wexford Road, Arklow, Co. Wicklow, Y14 HY80	

		single storey commercial buildings measuring c. 1,191 sqm overall and associated and ancillary site clearance of former Healy Premises; 3) The construction of a single storey Discount Foodstore Supermarket with ancillary off-licence use (and mezzanine plant deck) measuring c. 2,290 sqm gross floor space with a net retail sales area of c. 1,452 sqm.
Planning Reference	24285	Construction of 3 no. detached houses with new access entrance and connection to existing services.
Status	Granted	
Location	Knockenrahan Upper, Wexford Road, Arklow, Co. Wicklow	
Planning Reference	23843	The proposed development includes an amendment to the development permitted under Reg. Ref. 21/1080, The proposed development will consist of the following to facilitate the above. Demolition of the existing structures on the western part of the site that comprises 4 no. industrial commercial buildings, an associated hut / outbuilding, a gas enclosure, and a tank with bund wall. The removal of the remains of a previously demolished building, areas of hard standing, and existing surface treatments. The relocation of the Energy Centre 1 to the western part of the site, which will supersede the previously permitted 110kV GIS substation compound at that location under ABP Ref: VA27.309252. The proposed development will provide for a revised energy centre design, to include the provision of 8 no. gas turbines (with associated flues of 25.15m in height), 4 no. black start emergency generators and associated transformers, 2 no. single storey fuel oil pump rooms with a gross floor area (GFA) of 90.17sq.m, a single storey air compressor building with a GFA of 88.9sq.m, 4 no. fuel tanks, 2 no. MCC control rooms with a GFA of 44.17sq.m, 3 no. fire water tanks, a single storey welfare, storage, and pump room building with a combined GFA of 160.97 sq.m, a two storey MV /LV building with a GFA of 655.54sq.m, 8 no. 11kV/ 33kV step-up transformers in the north of the site, water treatment equipment, and a security hut, all within a fenced compound.
Status	Granted	
Location	Site at Avoca River Park, Arklow, Co. Wicklow	
Planning Reference	23381	Demolition of the existing three storey detached office building (646 sqm) and single storey
Status	Granted	

Location	Arklow Shipping premises, North Quay, Arklow, Co Wicklow	outbuilding (30 sqm); and the construction of a new five storey apartment block (3,196 sqm GFA) comprising of 34 No. apartments (14 No. one-bed apartments and 20 No. two-bed apartments)
Planning Reference	2372	The proposed development consists of the following: Demolition of the existing structures on site (industrial structures and outbuildings) and site clearance works; construction of 3 no. three storey information and communication technology (ICT) facility buildings, each with a gross floor area (GFA) of c. 16,206 sq.m (c. 48,618sq.m GFA in total), and with a parapet height of c. 19.5 metres; each of the 3 no. ICT buildings will accommodate ICT equipment rooms, mechanical equipment rooms, staff welfare facilities, ancillary office space, security rooms, storage, and loading bays; a customer compound, a power trunk building, a transformer compound and a water tank compound area are provided to the north of the ICT facility buildings;
Status	Granted	
Location	Site located at Avoca River Park, Arklow, Co. Wicklow	
Planning Reference	22433	the installation of underground electrical infrastructure between the existing Arklow Gas-insulated Switchgear (GIS) 220kV Substation and the permitted Pollahoney GIS Substation. This will include the installation of approximately two underground electricity cable circuits, each at 3.12km in length and associated underground ducting, horizontal directional drilling, joint bays, communication cabling infrastructure between the existing Arklow GIS 220kV Substation and the permitted Pollahoney GIS substation, (WCC reg ref 20/1285).
Status	Granted	
Location	Townlands of Killiniskyduff, Tiknock, Kilbride, and Shelton Abbey	

Future Development

Any future planning applications relating to the development will be assessed separately and are outside the scope of this EIAR.

3.6 'Do Nothing' Scenario

The site remains undeveloped as a greenfield agricultural site.

3.7 Worst Case Scenario

The site gets partially completed and is a ghost estate. This can be mitigated against through the use of appropriate conditions and security bonds requiring the developer to complete in line with the proposed development.

3.8 Monitoring & Reinstatement

Not applicable.

3.9 Difficulties in Compiling Information

There were no difficulties in compiling this information.

3.10 References

None applicable.

4. Population and Human Health

4.1 Introduction

This chapter addresses the impacts of the proposed Large-scale Residential Development on population and human health. This chapter has been prepared by Brenda Butterly, who is the associate director of McGill Planning Limited, has worked for over 20 years as a Town Planner in Ireland. Brenda has a Master's in Regional and Urban Planning from University College Dublin. McGill Planning Limited, has carried out numerous EIAR and EIA Screenings. They have also been involved multiple Strategic Housing Developments, Large-scale Residential Development and regular planning applications in recent years.

The following guidance was used in the preparation of this chapter:

- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment (European Union, 2017).
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022).
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2002)
- United States (US) EPA Health Impact Assessment Resource and Tool Compilation (US EPA 2016);
- Institute of Public Health in Ireland (IPHI) Health Impact Assessment Guidance (IPHI 2009).
- IEMA's Health in Environmental Impact Assessment: a primer for a proportionate approach

4.2 Methodology

Population

To establish the existing receiving environment/baseline for the subject site, the methodology included site visits to evaluate the location and likely significant potential impact upon the human population in the area.

Desk based study included an analysis of the Central Statistics Office Census (CSO) data, the ESRI Quarterly Economic Commentary, and national, regional and local planning policy, and school and creche enrolment figures.

Different local catchment areas were established for analysing population data, creche demand and capacity, and school demand and capacity. These areas were chosen to gather the most relevant data for each factor. A general local catchment area of 2km from the subject site forms the basis of most areas of analysis.

The following datasets were used during the survey:

- 2022 CSO Statistics
- 2016 CSO Statistics
- 2024 Google Maps
- Wicklow County Council website
- Department of Education
- HSE Facilities
- Pobal

- Information from schools in the area

Human Health

To establish an existing baseline of the human health of the area, desk-based study including an analysis of the Central Statistics Office Census (CSO) data was undertaken. As referenced in the Department of Housing, Planning and Local Government (2018) Guidelines for Planning Authorities and An Bord Pleanála, (taken from the European Commission's Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report (2017)), human health is:

> *"a very broad factor that would be highly Project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population."*

The WHO (World Health Organization) also define health as

> *"a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."*

4.3 Receiving Environment

The subject site is located within Wicklow County Council are designated Action Area Plan 3 (AAP3) – Kilbride Lands. The majority of the AAP3 lands are subject to a single zoning – "*MU: Mixed Use"* with the objective *"To provide for mixed use development."* To the south of the subject site, where the proposed Boardwalk is located, is zoned *'Arklow Town Marsh, pNHA'*.

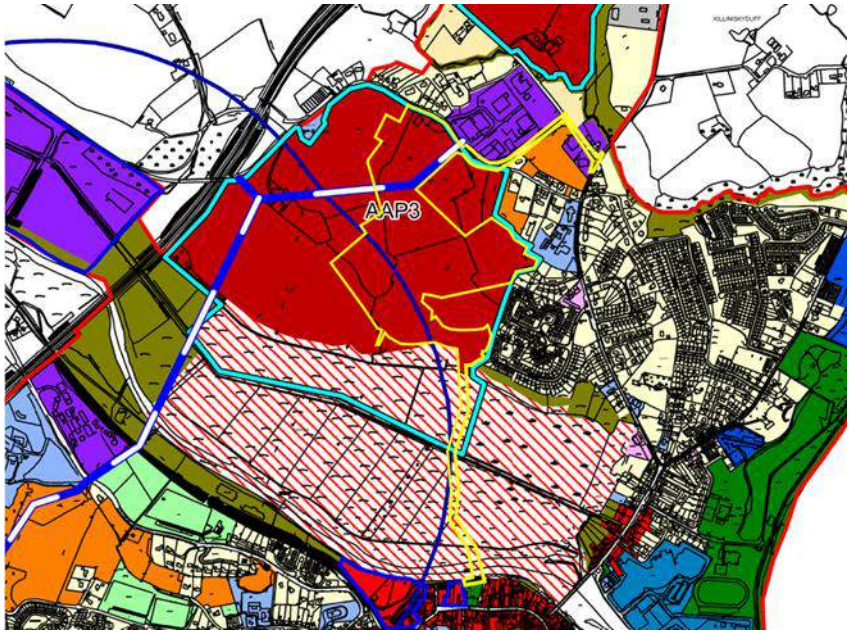


Figure 4.1: APP3 Zoning Map with site outline shown in yellow.

The site as a whole is currently in agricultural use and slopes in a broadly north / south direction to the town marsh and Avoca River. The Pyramid of Arklow; national monument, and its associated graveyard are located to the north of the ownership area but at a significant distance outside of the application site and the proposed new road. This pyramid has been well maintained over the years. There is also a surrounding external wall around the graveyard which is in varying condition.

There are hedgerows and trees on the site but there are no category A trees within the site. To the south of the site, there is an area within the Arklow Town Marsh pNHA (proposed Natural Heritage Area). This pNHA is a non-statutory designation. There is also a small drainage ditch to the east of the subject site. The site is not located within a Conservation Area or an Architectural Conservation Area.

Population

For the purpose of this population analysis a "Local Catchment Area" (which will be referred to as Local Area) was selected to include the Electoral Divisions (EDs) within 1km and 2km of the subject site. The EDs were chosen as a basis of analysis as, unlike the Small Area boundaries, the ED boundaries have remained unchanged from census to census and therefore can be used to compare population changes over time.

While the subject site is located within Kilbride Electoral Division, and reflecting the approach throughout this audit, four electoral divisions are within a 1km & 2km buffer of the subject site. These electoral divisions are Kilbride ED, Arklow No, 1 Urban ED, Arklow No. 2 Urban ED and Arklow Rural ED. However, the Arklow Rural ED was omitted from the local catchment area analysis as only a small portion of the ED falls within the 2km buffer and the remainder of the ED falls outside of the buffer area causing it to be an outlier.

This approach is supported when comparing the maps in *Figure 7* below. It was obvious that Arklow Rural Electoral Division was an outlier from the outset. Therefore, Arklow Rural ED has not been included within the Local Catchment Area to eliminate a skew in data. The chosen Local Catchment Area includes Kilbride, Arklow No.1 Urban, Arklow No.2 Urban EDs as seen in the figure below.

Figure 4.2: Local Catchment Area

The table shows population growth between 2016 and 2022 at three levels: local, county (Wicklow), and national. The local area saw a modest increase of 440 people (3.17%), while Wicklow experienced a stronger growth of 13,426 people (9.43%). Nationally, the population rose by 387,274, representing

an 8.13% increase. This indicates that population growth in Wicklow outpaced the national average, while the local area grew at a slower rate.

Table 4.1: Population Change from 2016-2022

Level	2016 Population	2022 Population	Population Change 2016-2022	Percentage Change 2016-2022
Local Area	13,878	14,318	+440	3.17%
Wicklow	142,425	155,851	+13,426	9.43%
National	4,761,865	5,149,139	387,274	8.13%

Age Profile

The total population of the Local Catchment Area is 14,318 persons which was established from the CSO Census Data 2022. This is a 3.17% increase from the 2016 CSO Census Data. This is significantly below the average growth rate nationally which is 8.1%.

The 2022 census shows that 4.9% of the resident population were aged between 0 and 4, or a total of 706 children. However, when compared to the 2016 census it was showing a severe decline in this age bracket by nearly 52%.

A further 3,186 persons are aged between 5 and 19 years old or 22.25% of the total population, this was a minor increase in this age group when compared to 2016. The 20 to 34 years old cohort comprises 2,215 persons or 15.47% of the total population. The 35-64 age group comprised of 6,085 persons which is 42.50% of the 2022 Local Catchment area. The remaining 2,126 (14.88%) persons were aged 65+ within the Local Catchment Area in 2022.

Table 4.2: Age Profile for Local Catchment Area

Age	2011	2016	2022	Change	Percentage Change
0-4 Pre-school	1,251	1,032	706	-326	-31.59%
5-19 School Children	2,678	3,056	3,186	+130	4.25%
20-34 Adults	3,125	2,513	2,215	-298	-11.56%
35-64 Adults	5,156	5,564	6,085	+521	9.36%
65+ Adults	1,469	1,713	2,126	+413	24.11%

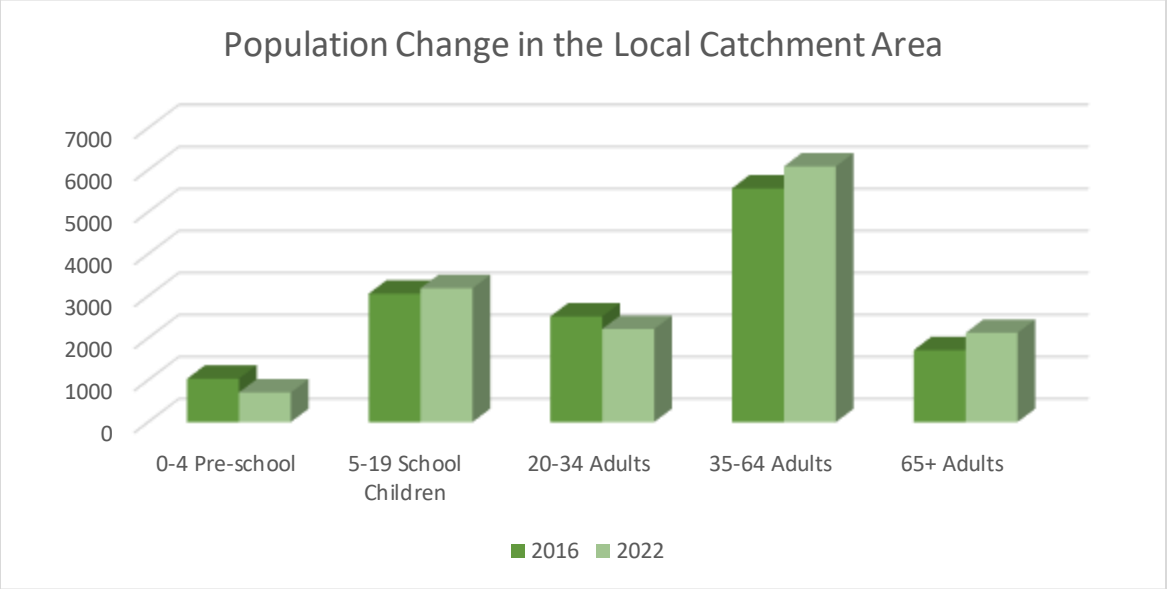


Figure 4.3 Changing Population of the Local Catchment Area from 2016-2022

Table 4.3: Percentage of Local Catchment Area Population

Age	2022	Percentage of Local Catchment Area Population
0-4 Pre-school	706	4.9%
5-19 School Children	3,186	22.25%
20-34 Adults	2,215	15.47%
35-64 Adults	6,085	42.50%
65+ Adults	2,126	14.88%

Employment

The CSO's Quarterly Labour Force Survey provides information in relation to national employment levels, unemployment levels and current labour force participation rates. While the Covid-19 pandemic had impacted the employment and unemployment levels adjusted measures were produced to ensure transparency around the impact of Covid-19 on the labour market, this is no longer the situation. These figures were not consulted within this section as Covid-19 is no longer an ongoing issue. The unadjusted data for Q22021, Q2 2022, Q2 2023 is consulted to determine a comparison with Q2 2024.

ILO Economic Status Ireland	Q2 2021	Q2 2022	Q2 2023	Q2 2024	Annual Change	
All Persons					2023-2024	%
In Labour Force	2,568,600	2,722,300	2,804,900	2,885,400	82,500	3%
In Employment	2,382,200	2,601,200	2,682,700	2,754,200	71,500	2.7%
Unemployed	186,400	121,100	122,200	131,200	9,000	6.8%
Not in Labour Force	1,498,500	1,447,300	1,465,100	1,484,600	19,500	1.3%

Total Persons aged 15 or over	4,067,100	4,169,700	4,270,000	4,370,000	100,000	2.28%
Unemployment Rate %	4.9%	4.4%	4.3%	4.6%		

Table 4.4: Labour Force Survey Q2 2021, 2022, 2023 and 2024 (standard methodology). Source: CSO

Within the local catchment area, 51% of the population aged 15 and over are in work according to the 2022 Census. This was determined from data collected based upon ones *'principal status'*. See Table 4.5 below which provides a breakdown of those *'at work'*, *'retired'*, *'looking for first regular job'* etc.

	Local area				Wicklow	State
Principle Economic Status	**2016**	**2022**	**Change**	**% 2022**		
At work	5,098	5,829	731	51%	55.8%	56.08%
Looking for first regular job	95	110	15	0.96%	0.77%	0.83%
unemployed	1215	658	-557	5.7%	4.3%	4.26%
Student	1,028	1,131	103	9.9%	10.6%	11.1%
Looking after home/family	1,034	981	-53	8.6%	7.4%	6.58%
Retired	1,452	1,787	335	15.6%	16.01%	15.9%
Unable to work due to permanent sickness or disability	615	802	187	7%	4.2%	4.57%
Other	93	114	21	0.10%	0.73%	0.65%
Total	10,630	11,412	782			

Table 4.5: Primary Status of population in the Local Area, Wicklow and State according to the census

The local area had a population of 5,098 at work, according to the 2022 census. This was an increase of 731 since 2016. The unemployment rate decreased by 557 persons. The largest industry was commerce and trade employing 1,526 people in 2022. It had grown by 194 persons since 2016. The industries that decreased in employment were Agriculture, Forestry and Fishing and the other category.

There was a significant increase by 780 in retired individuals which could be a sign of an aging population. The area would benefit from increased inward migration of younger families to add to the work force.

Industry	Local Area 2016	Local Area 2022	Change
Agriculture, Forestry and Fishing	81	71	-10
Building and Construction	304	447	143
Manufacturing Industries	747	759	12
Commerce and Trade	1,332	1,526	194

Transport and Communication	345	402	57
Public Administration	177	212	35
Professional Services	1,029	1,343	314
Other	1083	1069	-14
Total	**5,098**	**5,829**	731

Table 4.6: Populations at work by industry in the local area

Health

Human Health is a very broad factor and is interrelated with climate and air quality, water quality, the noise environment, access to nature, mobility and accessibility, and human connections. The World Health Organization defines "health" broadly as "a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity".

The 2022 census records the self-evaluation general health status of respondents. Results from the 2022 census indicated that 51.3% of the local area identified themselves as being of "Very Good" health. This is slightly below that of the State's population with 53.23% identifying as being of "Very Good" health. It is noted that it is a slight decline compared to the 2016 figures, however, there has been an increase in the number of people report Good and Fair general health. Furthermore, according to data, the highest percentage of the population of the local area identified themselves as being of "Very Good" health, and the lowest percentage of the population identified themselves as being of "Very Bad health".

General Health	Local Area 2016	Local Area 2022	State 2022
Very Good	58.7%	51.3%	53.23%
Good	28.1%	31.4%	29.66%
Fair	9.12%	10%	8.64%
Bad	1.54%	1.8%	1.40%
Very Bad	0.32%	0.4%	0.33%
Not Stated	2.11%	5.1%	6.74%
Total	100%	100%	100%

Table 4.7: General Health Results for the State and Local Area (Source: CSO Census 2022)

The surrounding context of the site consists of a mix of residential, community and amenity related land uses. Therefore, it is not expected that future residents of the scheme will suffer from poor levels of air quality or noise levels from surrounding activities. The surrounding area also does not include any man-made industrial sites or activities (including SEVESO II Directive sites) that would be likely to result in a risk to human health and safety.

Access to nature has biological, mental, and social benefits to people. There are a number of green spaces within the vicinity of the subject site. For instance, the Riverwalk Garden to the south of the site and is open to the public to walk around and enjoy the green spaces. The proposed development also incorporates a vast amount of public open space for future residents in the provision of a public parks and a boardwalk through the Arklow Town Marsh. These existing, accessible public spaces, along with the proposed open spaces in the development will provide opportunities for residents to recreate and to connect with adjoining communities in the area.

Household Characteristics

Trends in household data from the intercensal period for the Study Area are summarised in the table below.

Composition of Households	2016	2022	Change	%Change	2022 %	Wicklow	State
One person	1220	1311	91	7.46%	24.60%	20.41%	23.14%
Married couple	733	780	47	6.41%	14.60%	15.79%	14.90%
Cohabiting couple	187	191	4	2.14%	3.60%	3.96%	4.34%
Married couple with children	1461	1421	-40	-2.74%	26.60%	32.55%	29.42%
Cohabiting couple with children	344	328	-16	-4.65%	6.15%	5.01%	4.26%
One parent family (father) with children	82	88	6	7.32%	1.65%	1.61%	1.46%
One parent family (mother) with children	580	627	47	8.10%	11.70%	8.94%	8.45%
Couple and others	53	57	4	7.55%	1.06%	1.29%	1.51%
Couple with children and others	80	104	24	30.00%	1.95%	2.48%	2.20%
One parent family (father) with children and others	7	15	8	114.29%	0.28%	0.28%	0.27%
One parent family (mother) with children and others	59	79	20	33.90%	1.48%	1.36%	1.20%
Two or more family units	76	75	-1	-1.32%	1.40%	1.77%	1.24%
Non-family households and relations	98	88	-10	-10.20%	1.65%	1.62%	2.23%
Two or more non-related persons	95	164	69	72.63%	3.07%	2.85%	5.39%
Total	**5075**	**5328**	253				

Table 4.8: Local Catchment Area Household Composition vs Wicklow and the State

The majority of households are composed of 'married couple with children' which is down by -2.75% on 2016 levels for the Local Catchment Area. 'One Person' households (Local Catchment Area 24.60%) has seen an increase of 7.46% in the catchment are from 2016 levels. The third most notable household composition in the local catchment area is 'Married Couple' at 14.6% of the total households. Distribution is relatively evenly split across other compositions.

4.4 Social Infrastructure

Social infrastructure and amenities are, according to The British Academy article "Social Infrastructure in two minutes", "*the crucial organisations, places and spaces that enable communities to create social connections – to form and sustain relationships that help them to thrive*." This includes facilities and services that provide individual/ household benefits and community benefits to increase social cohesion. This can range from restaurants and pubs to shopping centres and gyms to open space. An overview of the social infrastructure available within proximity of the site is presented in the series of tables and maps (figures) set out below. As seen in the social infrastructure maps, a variety of different social infrastructure facilities are within easy reach of the site. The number of social facilities within 1km and 2km are listed in the table below.

Education

With respect to education, there are currently 5 no. primary schools and 4 no. post primary schools in Arklow. There are no third level institutes operating in Arklow although adult education services are provided by the Education and Training Board (ETB).

There are 5 no. mixed gender primary schools within 2km of the application site. There are 2 no. mixed gender post primary schools, 1 no. all boys post primary school and 1 no. all girls post primary school within 2km of the site. These education facilities are mapped in *Figure 10* below. The 2024/2025 enrolment figures for each education facility are displayed in *Table 5* below.

We note that Arklow Senior Boys National School, St Michael's Girls National School and St. Peter have amalgamated in recent years (2015) to create St. Michaels and Peters Junior School and St. Johns Senior School.

It is also noted that a new Educational Campus has been granted permission within the Kilbride Masterplan lands by the Department of Education (Ref. 22/213) and which will comprise a 2-storey, 16 classroom primary school (c. 400 primary school places) and a 3-storey post primary school for 400 students.

Figure 4.4 Primary, Post Primary Schools and future school sites within 1km & 2km of the subject site

No. on map	Primary School	Distance	Enrolment (24/25)	
			Boys	Girls
1.	St Joseph's National School	c. 0.4km	287	273
2.	Ss Michael & St Peter Junior School	c. 0.9km	138	161
3.	St Johns Senior School	c. 1.1km	182	183
4.	Carysfort Mixed National School	c. 1.8km	97	109
5.	Gaelscoil an Inbhir Mhoir	c. 1.9km	134	143
No. on map	**Post Primary School**	**Distance**	**Enrolment (24/25)**	
			Boys	**Girls**
1.	Gaelcholaiste Na Mara	c. 0.9km	165	123
2.	St Marys College	c. 1.2km	-	538

3.	Arklow CBS	c. 1.2km	372	-
4.	Glenhart College	c. 1.6km	344	278

Table 4.9: 2023/2024 Enrolment Figures for each education facility within 2km of the site

As the Arklow area experiences a shift in development, this audit includes future education developments within the surrounding area as outlined under the Arklow and Environs LAP 2018-2024.

> *The Department of Education seeks that lands are designated for education to cater for the targeted population expansion of the town and school catchment area. In order to ensure that there is adequate capacity in both the primary and secondary schools in the town, this plan has designated lands for 2 additional primary schools and for 1 new secondary school at Tinahask Upper/Money Big (AAP1 and AAP2) and for a school site at Kilbride (AA3).*

Education development lands in the Arklow Area		
No. on Map	**Development Address**	**Area zoned for educational development**
Within 2km of Subject Site		
A	School site in Kilbride (AAP3)	5 ha This has been granted permission for 400 primary and 400 secondary school places.
Outside 2km of Subject Site		
B	Tinahask Upper/ Money Big (AAP1 & AAP2)	3.5 ha & 4 ha No application has yet been submitted.

Table 4.10 Lands zoned for future educational development under the Arklow LAP

Childcare Facilities

The site is well serviced with childcare facilities when considering a 2km buffer. Within a 1km buffer there are 9 no. childcare facilities readily available and a further 7 no. childcare facilities within 2km of the site.

Figure 4.5 Existing childcare facilities within 1km & 2km of the subject site

	Existing Childcare Facilities within 1km of Subject Site	Location	Distance
	Childcare Facilities		
1.	Kidz Ink Childcare	11 Inbhear Mór Square, Templerainey	c. 0.2km
2.	Building Blocks Montessori Preschool	Presbyterian Church, Dublin Rd, Tiknock,	c. 0.4km
3.	Head Start Preschool & Montessori	Methodist Church, Ferrybank	c. 0.6km
4.	Twinklers Montessori School	Coral Leisure, Seaview, Ferrybank	c. 0.9km
5.	Ark Preschool	Masonic Hall, Ferrybank	c. 0.7km
6.	Early Days Academy	Level 3, Bridgewater Shopping Centre	c. 0.9km
7.	Little Treasure Playgroup	14 Lower Main St.	c. 0.9km

8.	Blackberry Academy	St. Mary's Road	c. 1km
9.	First Steps Playschool and Creche	35 Cluain Árd, Sea Road	c. 1km
	Existing Childcare Facilities c. 2km of Subject Site	**Location**	**Distance**
10.	Aisling Playschool	61 Lower Main Street	c. 1.06 km
11.	An Scoil Bheag	39a Wexford Road	c. 1.1km
12.	Poppins Creche	Mt Carmel, Coolgreaney Rd.	c. 1.1km
13.	Pixies Montessori Pre-School	162a Fernhill	c. 1.7km
14.	Kids Inc Gaelscoil Arklow	Gaelscoil Inbhir Mhóir, Emoclew Road	c. 1.9km
15.	Ray Of Sunshine Arklow	Gaelscoil, Emoclew Road, Knockanrahan upper	c. 1.9km
16.	Kanga Kare Childcare Limited	Woodlands, Lamberton	c. 2km

Table 4.11 List of childcare facilities within 1km & 2km of the application site

Health Services

There are numerous General Practitioners and Pharmacies available within a 2km distance of the subject site alongside two health centres.

As can be seen from the data below, the site is well served by the existing services within Arklow Town Centre, and indeed better than most towns. It has a good range of pharmacies, GP's along with two health centres. Furthermore, it is within 55km or less than an hour from the Emergency Department in Wexford, while St Columcille's Hospital is under 50km away in the opposite direction.

Figure 4.6 GPs & Health Centres within a 2km distance of the subject site

Figure 4.7 Existing Pharmacies within a 2km distance of the subject site

No. on Map	Existing Health Services within 1km & 2km of Subject Site	Location	Distance
	GPs & Health Centres		
1.	Bradshaw's Lane Surgery	Bradshaw's Ln, Arklow	c. 0.8km
2.	Arklow Medical Practice	3 Upper Main St, Arklow	c. 0.9km
3.	Arklow Health Centre	2 Castle Park, Arklow	c. 0.8km
4.	Primary Care Health Centre	Castle Park, Arklow	c. 0.8km
5.	Caredoc Arklow	The Health Clinic, Castle Park	c. 0.9km
6.	Maryville Surgery	Primary Care Health Centre, Castle Park	c. 0.9km
7.	Shelton Surgery	45-52 R772, Ferrybank	c. 0.7km

8.	Harbour Surgery	Evans Terrace, 1C Harbour Rd, Tinahask Lower,	c. 1.3km
Pharmacies			
9.	Ferrybank CarePlus Pharmacy	Ferrybank, Arklow	c. 0.7km
10.	Boots	North Quay, Arklow	c. 0.8km
11.	Adrian Dunne Pharmacy	41 Main St, Arklow	c. 0.8km
12.	Allcare Pharmacy	46 Main St, Arklow	c. 0.8km
13.	McGorisks Pharmacy	Castle Park, Arklow,	c. 0.8km
14.	O'Mearas CarePlus Pharmacy	30 Upper Main St, Arklow	c. 0.9km
15.	Armstrong Life Pharmacy	40A Wexford Rd, Arklow	c. 1km
16.	First Choice Pharmacy	Tesco Shopping Centre, Arklow Square, Wexford Road,	c. 1.3km
17.	Grants Pharmacy	Wexford Rd, Knockanrahan Lower	c. 1.49km

Table 4.12: Health Services within 1km & 2km

As seen in *Table 11* below, the distances of hospitals from the subject site are shown. Gorey District Hospital is the closest to the application site (c. 18km). The next nearest hospital is Naas General Hospital (c. 35km).

Hospitals		
Hospital Name	**Location**	**Distance**
Gorey District Hospital	13 Mc Curtain Road, Gorey corporation lands, Gorey, Co. Wexford	c. 18km
Naas General Hospital	Craddockstown Rd, Naas East, Naas, Co. Kildare	c. 35km
St. Columcille's Hospital	Bray Rd, Loughlinstown, Co. Dublin	c. 50km
Wexford General Hospital	Newtown Road, Wexford	c. 55 km
St Lukes General Hospital	Freshford Rd, Friarsinch, Kilkenny, R95 FY71	c. 76 km
Midland Regional Hospital Portlaoise	Block Rd, Ballyroan, Portlaoise, Co. Laois	c. 79km

Table 4.13: Distance of Hospitals from the subject site

ArcGIS was consulted to determine the average distance to an Emergency Hospital in the main electoral divisions including and surrounding the application site. This site is approximately 55 km from a Wexford General Emergency Hospital, while St Columchille's Hospital is c. 50km away travelling north. This is better that the average nationally.

Figure 4.8: Average Distance to Emergency Hospitals at ED level in Ireland (2019 SdgIreland curator, ArcGIS)

There is 1 no. nursing home within 1km of the subject site. There is a further 1 no. nursing home that falls outside of the 2km buffer area as seen in *Table 12* below.

Nursing Homes		
Nursing Home Name	**Location**	**Distance**
Asgard Lodge Nursing Home	Monument Lane Kilbride, Arklow, Co. Wicklow	c. 0.9km
Aisling House Nursing Home	Seabank Terrace, Seabank, Co. Wicklow	c. 2.3km (outside of buffer area)

Table 4.14: Nursing homes within 2km of the subject site

There are 3 no. dental facilities within 1km of the application site as seen in *Table 13* below.

Dental Facilities		
Dental Facilities	**Location**	**Distance**
Arklow Orthodontics	Brigg's Ln, Ferrybank, Arklow	c. 0.6km
Arklow Dental Surgery	18 Main St, Arklow	c. 0.8km
Kavanagh Dental	Hibernian House, Lower Main St, Arklow	c. 0.8km

Table 4.15: Dental Facilities within 2km of the Subject Site

This audit acknowledges specific health facilities such as mental health facilities and eye facilities as seen in *Table 14* below.

Health Specific Facilities		
Health Facility	**Location**	**Distance**
Philip Gleeson Sports Injury Clinic	Butler House, 30 Main St, Abbey Ln, Arklow	c. 0.8km
Sunbeam House Services - Ballyraine	Vale Rd, Yardland, Arklow	c. 1.4km
Arklow Physiotherapy Clinic	12 Ferrybank, Arklow	c. 0.6km
The Blessings Clinic	N Quay, Ferrybank, Arklow	c. 0.8km
Mulligan Injury Clinic	Unit 10 Croghan industrial estate, Arklow	c. 2km
Linton Therapy Clinic	Sheltonville Surgery, Ferrybank, Arklow	c. 0.6km
Health at Hand	Butler House, Abbey Ln, Arklow	c. 0.6km
Portview Day Centre	Knockenrahen Industrial Estate, Arklow	c. 1.8km

Table 4.16: Health Specific Facilities within 2km of the site

From the mapped medical services above, it is evident that there is no direct provision of medical services on lands north of the Avoca River. The proposed development incorporates a c.408sqm community/medical units within the proposed local centre to accommodate this lack of direct provision.

Community Facilities

The area of Arklow has a range of community facilities. The majority of these community facilities are established within the centre of the town. Social and Community facilities are varied in nature and can include general civic services and services targeted to specific section of the community.

Arts facilities in Arklow offer all the community, young, old and minority groups, a creative outlet, and an alternative to sport and active recreation. There are several churches and religious buildings serving a variety of different faiths in Arklow.

Figure 4.9: Community, art & religious facilities within 2km of the subject site

Community Facilities			
General			
No. on Map	**Community Facility**	**Location**	**Distance**
1.	Arklow Women's Shed	Community Hall, Upper Main Street, Arklow	c. 0.8km
2.	Brook Community Garden	53A S Green, Arklow	c. 1.1km
3.	Ark Community Playgroup	Abercorn Masonic Hall, Ferrybank, Arklow	c. 0.8km
4.	Arklow Library	7 Main St, Arklow	c. 0.8km
Arts Facilities			
No. on Map	**Art Facility**	**Location**	**Distance**
5.	Arklow Maritime Museum	N Quay, Ferrybank, Arklow	C 0.9km
6.	Arklow Visual Arts Gallery	Apartment 17, 29 Main St, Arklow	c. 0.7km
Religious Facilities			

No. on Map	Religious Facility	Location	Distance
7.	St. Joseph's, Templerainey	Dublin Rd, Tiknock, Arklow	c. 0.5km
8.	Arklow Presbyterian Church	Dublin Rd, Tiknock, Arklow	c. 0.5km
9.	Arklow Methodist Church	Ferrybank, Arklow	c. 0.6km
10.	Banner of Love Church	Abbey Ln, Arklow	c. 0.9km
11.	Arklow Baptist Church	St Michael's Terrace, Tinahask Lower, Arklow	c. 1.4km
12.	St. Mary's & Peter's Catholic Church	13 St Mary's Rd, Arklow	c. 0.9km
13.	Arklow Christian Community Church International	St Mary's Chapel, St Mary's Rd, Abbeylands, Arklow	c. 1.2km
14.	Árus Lorcáin	Árus Lorcáin, Castlepark, Arklow	c. 0.9km
15.	Saint Saviour's Church	Arklow, Co. Wicklow	c. 0.9km

Table 4.17: List of community, arts, and religious facilities within 2km of the subject site

Open Space, Sports and Leisure

There are a wide variety of sports clubs, playing fields and leisure facilities established in the Arklow area. Several specific clubs and organisations were identified operating in the surrounding 2km buffer, providing a range of clubs to cater for a wide range of interests including GAA, tennis, gymnastics, martial arts, golf, sailing and boxing.

Figure 4.10 Sports Clubs, Gym/Fitness Facilities within 2km of the Subject Site

The table below lists the variety of public parks and sports facilities within 1km and 2km of the site. The numbering corresponds to the map above, showing the location of each sports club and fitness facility.

Open Space, Sports, and Leisure Facilities			
Sports Clubs			
No. on Map	**Sports Club**	**Location**	**Distance**
1.	Pearse Park - G.A.A. Grounds	Yardland	c.1km
2.	Arklow Town Football Club	Glenart Dr, Lamberton	c.1.32km
3.	Arklow Lawn Tennis Club	Coolgreaney Rd, Yardland	c.1.2km
4.	Leinster Taekwon-do Arklow	Ferrybank	c.1km
5.	Arklow Sailing Club	N Quay, Ferrybank	c.1.1km
6.	Arklow Golf Club	Abbeylands, Arklow	c.1.9km
7.	Arklow United Football Club	Emoclew Rd, Sheephouse,	c.1.9km
8.	Arklow Boxing Club	Emoclew Rd, Knockanrahan Upper	c.2km
9.	Arklow Rock Parnells GAA Club	Rocks Road, Emoclew Rd	c.2km
10.	Cobra Gymnastics Club	Dock Rd, Tinahask Lower	c.1.6km
Gym & Fitness Facilities			

No. on Map	Gym/Fitness Facility	Location	Distance
11.	Time Out Fitness	3 Inver Square, Templerainey	c.0.3km
12.	The Bay Health & Leisure Club	Ferrybank, Arklow	c.0.8km
13.	Coral Leisure Arklow	Seaview Ave, Ferrybank	c.0.9km
14.	Sprint Spinning Studio Arklow	Ferrybank, Arklow	c.1km
15.	Arnkell Jiu Jitsu Academy	Y14 V348, 37 Lower Tinahask	c.1.3km
16.	Indoor Bootcamp	St Michael's Terrace, Tinahask Lower	c.1.5km
17.	Red Door Fitness / Gym in Arklow	2 Tinahask Lower	c.1.5km
18.	Box Fit Arklow	Knockanrahan Lower	c.1.8km
19.	Laura's Health & Dance Fitness	1C Wexford Rd, Arklow,	c.1.1km
20.	Pure Fitness Arklow	Croghan Industrial Estate	c.2km
21.	Marshland Sports Centre	Marsh, Arklow	c.0.1km

Table 4.18 Sports Clubs, Gym/Fitness Facilities within 2km of the Subject Site

The Marshland Sports Centre is located within a 1 minute walk from the site, while Time Out Fitness is located within a 5 minute walk of the site. Both The Bay Health & Leisure Club and Coral Leisure Arklow are a c.15 minute walk from site.

Given Arklow's coastal location there are various recreational and tourist facilities associated with the area including Glenart Wood, Riverwalk Trail, Arklow Crock Cliff Walk, and Arklow Rock Walking Trail. It is also noted that Arklow Gymnastics Club Emoclew Rd, Knockanrahan Upper, is located just outside the buffer zone, c.2.3km from site.

The below table identifies a range of natural scenic areas available to the future population of the subject site and surrounding hinterlands. These scenic areas include beaches and wooded / hiking areas and open spaces throughout the built environment and are considered a significant asset to Arklow.

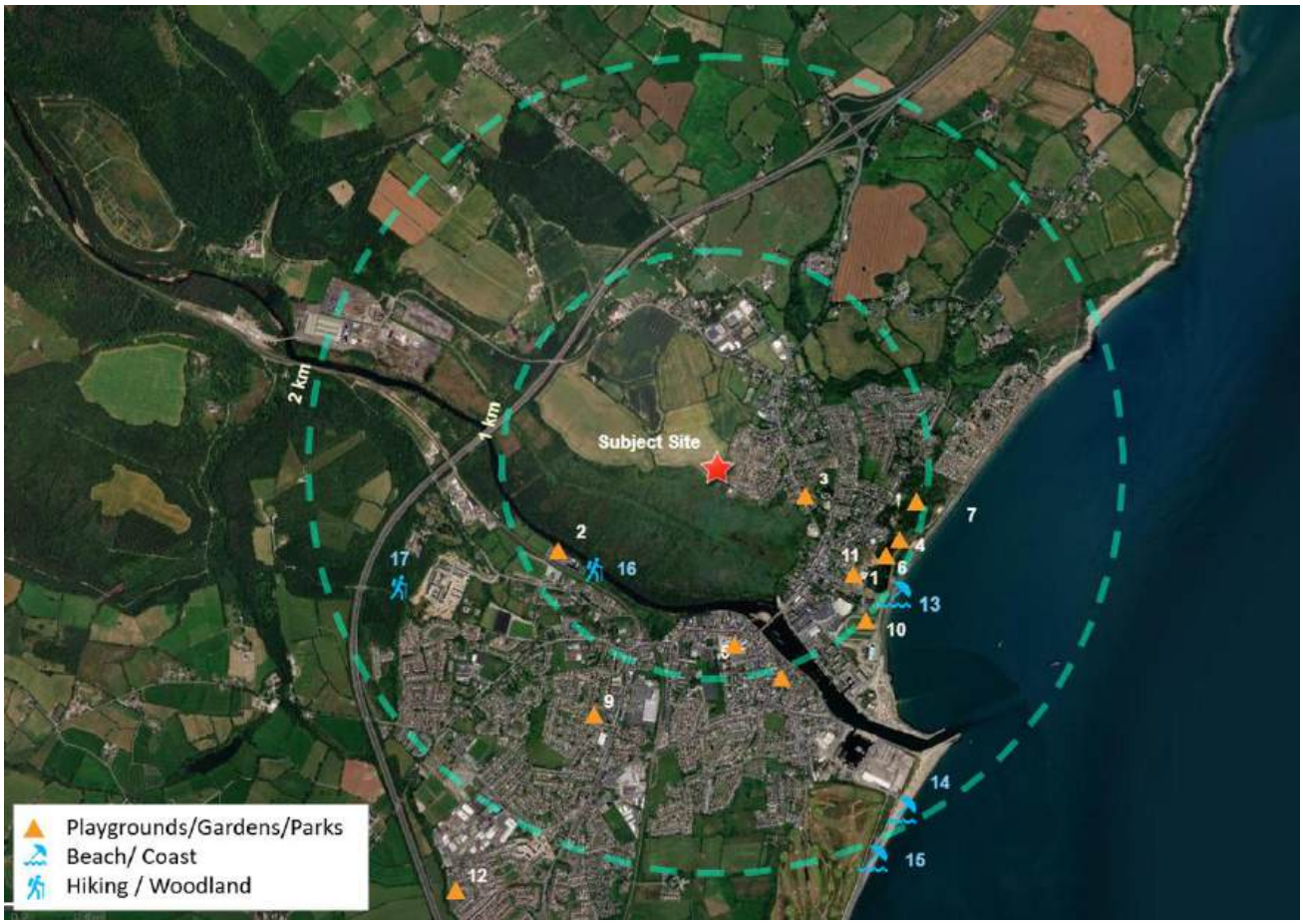


Figure 4.11: Playgrounds, Gardens, Parks, Beaches, Woodland and Hiking Areas within 2km of the Subject Site

Playgrounds/Gardens/Parks			
No. on Map	**Playground/Garden**	**Location**	**Distance**
1.	Bloom Garden	Seaview Ave	c. 0.9km
2.	Riverwalk Garden	Yardland	c.0.9km
3.	Dispensary Garden	Tiknock	c.0.5km
4.	Arklow Dog Park	Seaview Ave	c.1.6km
5.	Abbey Rose Garden	Old Abbey Park	c.0.9km
6.	Xeriscape Garden	Ferrybank	c. 0.9km
7.	Kynoch Park	Seaview Ave	c. 1 km
8.	St. Marys Park	Main St	c. 0.6km
9.	Peter's Place Playground	Knockanrahan Lower	c.1.4km
10.	Skate Park	Seaview	c.1.1km
11.	Arklow Children's Playground	Seaview	c.0.9km
12.	Meadowvale residents Playground	Knockanrahan Upper	c. 2.6km
Beach/Coast			
No. on Map	**Beach /Coast**	**Location**	**Distance**
13.	Arklow North Beach	Ferrybank	c.1km
14.	Arklow South Beach	Ferrybank	c.1.9km
15.	Tinahask Lower Beach	Tinahask Lower	c. 2.1km
Hiking/Woodland			

No. on Map	Hiking/Woodland	Location	Distance
16.	Riverwalk Trail	Avoca River	c.0.9km
17.	Glenart Wood	Lamberton	c.1.7km
18.	Arklow Rock Walking Trail	Rock Big	c.3.3km

Table 4.19: List of Playgrounds, Gardens, Parks, Beaches and Hiking Areas within 2km of the Subject Site

It is apparent from our review of Open Space, Sports and Leisure, that there is an appropriate provision within the surrounding area to serve the development now proposed. In addition, the subject proposal provides a 3.76 ha of public amenity spaces and pocket parks for the use of future residents and the public, that shall be linked by footpaths and cycleways to other smaller local public parks. A boardwalk providing pedestrian & cycle connection to Arklow Town Centre is also proposed.

Retail

The subject site is easily accessible to a wide range of retail and entertainment services in Arklow and the surrounding area.

Bridgewater Shopping Centre caters for international, regional and local retailers. The centre hosts retailers such as Dunnes Sores, Starbucks, Superdrug, TK Maxx, Jack & Jones, Costa, River Island, Easons, New Look, Intersport Elvery's, DV8 and many more. Every Thursday the shopping centre hosts the 'Arklow Farmers Market' which allows the centre to support local producers, traders and small businesses. On occasion the shopping centre entertains the community with special events such as 'Family Fun Day' and 'Arklow Makers Craft Fair' for examples of events taking place in October 2023.

It is also noted the high vacancy rate of retail premises along the Main Street, with many units available for rent. The proposed development would provide additional population to the area which in turn would enable a more viable market to enable these vacant units to re-open.

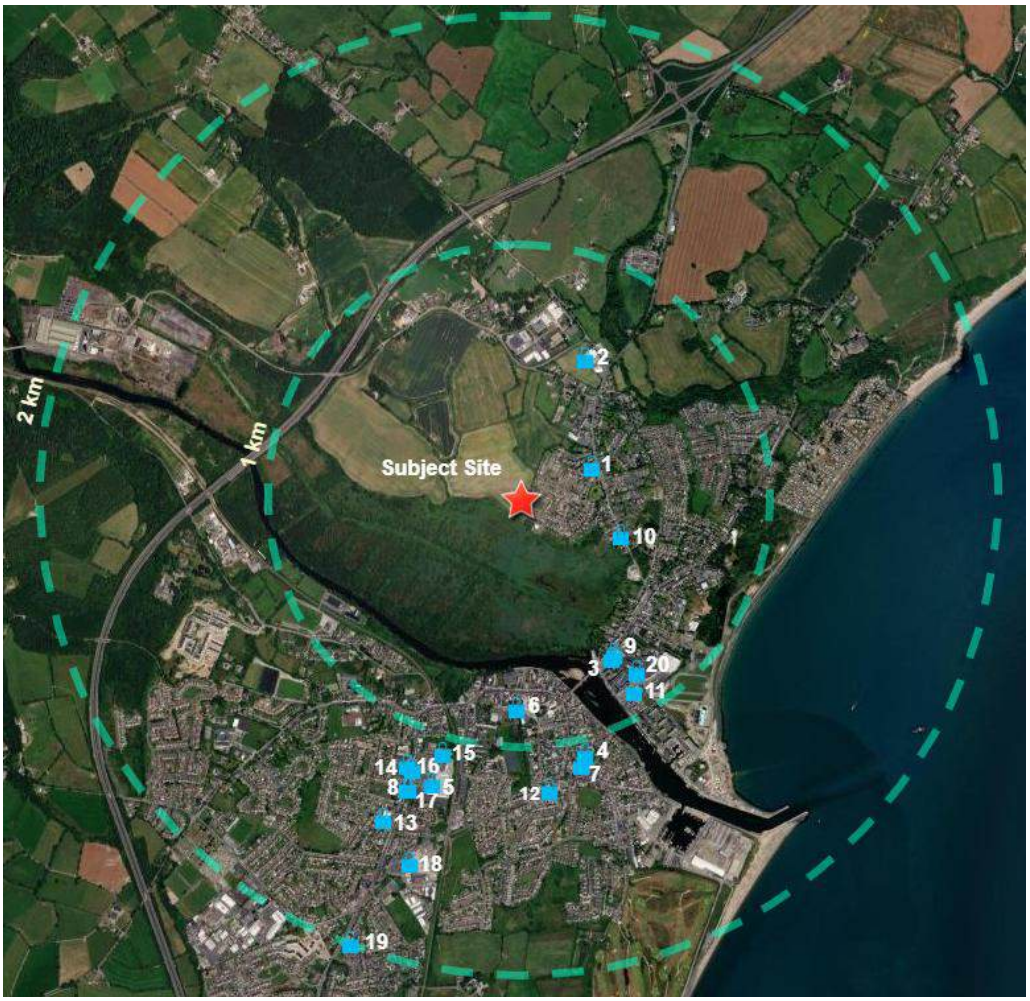


Figure 4.12: Retail/Shopping Centres and Convenience Stores within 2km of the Subject Site

Convenience Stores			
No. on Map	**Convenience Stores**	**Location**	**Distance**
1.	Gala	Dublin Rd	c. 400m
2.	Homesavers	Dublin Rd	c. 670m
3.	Dunnes Stores	N Quay	c. 890m
4.	Burkes Spar	Lower Main St	c. 1.2km
5.	Tesco Extra	Wexford Rd	c. 1.3km
6.	M&C Grocery Shop	Castle Park	c. 915m
7.	Myles Doyle & Sons	Lower Main St	c. 1.2km
8.	Orlik Aga Polish Shop - Polski Sklep	Bentley Court	c. 1.4km
9.	Copelands Centra Arklow	Ferrybank	c. 800m
10.	Circle K Safeway	Dublin Rd	c. 485m
11.	Aldi	N Quay, Ferrybank	c. 980m
12.	The 7-Eleven	Abbey St	c. 1.3km
13.	Pettitt's Supervalu	Wexford Rd	c. 1.5km
14.	Lidl	Wexford Rd	c. 1.25km
15.	Certa	Wexford Rd	c. 1.15km
16.	Kavanagh	Wexford Rd	c. 1.25km
17.	Multibuy Superstore	Wexford Rd	c. 1.35km
18.	Mr. Price Arklow	Yellow Lane	c. 1.65km

19.	Applegreen Arklow	Wexford Rd	c. 2.05km
Retail/Shopping Centre			
No. on Map	**Retail/Shopping Centre**	**Location**	**Distance**
20.	Bridgewater Shopping Centre (includes cinemas and restaurants)	Rathdown Lower	c. 970m

Table 4.20: Retail/Shopping Centre and Convenience Store within 2km of the Subject Site

As a result of the estimated population increase/generation from the proposed development of c.2,055 persons, the proposed local centre will include the provision of c.785sqm of retail space to cater for the generated demand.

Emergency Services

Arklow Ambulance Station (National Ambulance Service) and Garda Station have a central location within Arklow Town. The ambulance station is c. 0.9km from the site and the Garda station c. 1.01km from the subject site. Arklow Fire Station is approximately 2.06km from the application site. The RNLI Lifeboat Station based at South Quay in Wicklow Town is c. 1.64km from the subject site.

4.5 Characteristics of the Proposed Development

The proposed development consists of a Large-Scale Residential Development with residential units, a local centre, a creche and open space. A detailed development description is included in Chapter 3 of this EIAR and in the statutory notices.

4.6 Potential Impacts

This section provides a description of the specific, direct, indirect positive and negative impacts that the proposed development may have on population and human health during both the construction and operational phases of the proposed development. Potential impacts are assessed under the following headings:

- Business and Residences
- Air Quality and Climate
- Retail, Community services and Healthcare
- Human Health
- Childcare
- Primary and Post Primary schools
- Risk of major accidents or disasters

The analysis comprises a study of the themes considering the construction and operational phases of development.

Impacts on Business and Residences

Construction Phase

The development in the short term (7 years maximum) will provide for construction related employment during the different phases of development, with additional spend in the local shops, restaurants etc. This will be a positive, moderate and short-term impact for these businesses.

Businesses directly involved in the construction phase of the development will also benefit from a positive, moderate and short term impact as a result of generating value and securing direct employment which in turn will contribute to the overall GDP of the economy and tax revenues at national level. The construction of the proposed development is therefore likely to have a moderate positive effect on the local employment and economic activity too. Through additional spending, this positive impact will be temporary through the construction phase.

The construction of the proposed development may give rise to moderate short term negative impacts to local residents, particularly those living in adjacent housing estates. Impacts include construction traffic and surface contaminants, dusts, and noise. These impacts have been considered in the relevant chapters of the EIAR and will be minimised or mitigated where appropriate. It is unlikely that these impacts will be of a scale to either encourage people to move from the area or discourage people from moving to the area.

Operational Phase

The proposed development will provide 666 no. of residential units, a local centre, a creche and significant public open space. When considering the national household size of 2.74 people this development will likely generate a population of c. 1,825 when fully occupied. This will contribute to the meeting the development targets of the National Planning Framework objective that at least 50% of new homes in Ireland's cities and large towns be located within or contiguous to existing built-up areas, thereby promoting compact growth.

Arklow is designated as a Level 3 Large Growth Town in the Wicklow County Development Plan and is identified for significant future population and employment growth. The Regional Spatial and Economic Strategy (RSES) for the Eastern and Midland Region recognises the strategic importance of towns like Arklow along the M11 corridor, which benefit from strong transport links and the potential to accommodate sustainable development. The site is well-served by existing transport infrastructure, including Arklow Train Station and regional bus services, providing connectivity to Dublin and other key settlements along the eastern corridor.

Considering that 65.51% of the population in the local area are in employment, it is anticipated that approximately 1,149 people within the proposed development would be part of the workforce. The inclusion of a creche and local centre within the development is expected to generate direct employment.

The increase in the resident and working population will enhance the vitality of Arklow, supporting local businesses, services, and community facilities. This growth will contribute to the town's economic resilience and community development, resulting in a long-term positive impact on both businesses and households.

Considering the above, the propose development will have a **significant permanent positive** impact on the population and households in the area.

Impacts on Air Quality and Climate

Construction Phase

Dust emissions from the construction phase of the proposed development have the potential to impact human health through the release of PM_{10} and $PM_{2.5}$ emissions. Therefore, in the absence of mitigation there is the potential for slight, negative, short-term impacts to human health as a result of the proposed development.

Operational Phase

Traffic related air emissions have the potential to impact air quality which can affect human health. However, air dispersion modelling of traffic emissions has shown that levels of all pollutants are below the ambient air quality standards set for the protection of human health. It can be determined that the impact to human health during the operational stage is long-term, neutral and imperceptible and therefore, no mitigation is required. These effects are discussed in further detail in Chapter 9 - Air Quality and Climate.

Impacts on Retail. Community Services and Healthcare

Construction Phase

During the construction phase, the local retail and community services will be temporarily negatively impacted by construction noise, traffic and dust. Although negative, this impact will be minor and will only continue for the construction period. However, to balance this, the construction phase will also have positive impacts for local retail, restaurants, local jobs and community services due to increased spending in the area by construction workers. This is considered a significant, temporary/ short term, neutral to positive impact.

Operational Phase

The local population increase that will be generated by the proposed development will support the existing retail and community facilities in the area.

Healthcare provision within the study area is considered to be of a sufficient scale, with 22 healthcare services and facilities in total, 3 of which are available within the 1km of the site, to serve the occupied development.

The additional provision of a creche, public open spaces, and linkages into and through the site, providing better connectivity within the area provides significant quality of life benefits for residents, neighbouring communities and connections. This will have a positive knock on effect in terms of public health and access to attractive safe environments to exercise and relax in. As such it is anticipated to have a positive, long term impact.

Impacts on Human Health

The European Commission's Guidance on the preparation of the Environmental Impact Assessment Report states at footnote no. 2

'Human health is a very broad factor that would be highly Project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population.'

It is clear from this broad definition that human health is interrelated with many factors which are addressed in separate EIAR Chapters. The relevant potential impacts from those chapters are summarised below.

Construction Phase

The construction phase of the proposed development may give rise to short term (less than 7 years), negative impacts to the locality such as

- increased construction traffic including the hauling of building materials to and from the proposed development site

- increased surface contaminants,

- increased exposure to dust and exhaust emissions,

- increased exposure to traffic and construction noise, and

- increased littering.

Operational Phase

The operational stage of the development is unlikely to cause any adverse impacts on the existing and future residents of the locality in terms of human health, and in fact, the development is likely to positively impact the wellbeing of residents. The design of the development has been formulated to provide for a safe environment for the future residents and visitors alike. The paths, roadways and public realm have been designed in accordance with the best practice and applicable guidelines. All open areas have been designed to be inviting, safe and conveniently located. The landscape design is made up of natural play areas and communal open spaces.

When complete the proposed development will increase the permeability and walkability of the site by providing safe and inviting pedestrian and cycling connections throughout the site. The proposal includes Boardwalk connecting the site to Arklow town centre. This will make walking and cycling an attractive transport mode and will encourage people to walk and cycle, which will in turn increase daily physical activity and improve people's health.

Chapter 11 Traffic and Transportation notes the proposed development will generate a number of trips by various modes of travel including vehicular, pedestrian, cycle and public transport. These trips may have an impact on the surrounding road network and could contribute to increased congestion.

Chapter 8 Noise and Vibration states that once the development is operational, the potential noise impacts to the surrounding environment are minimal. The residential aspect of the development is not expected to generate any significant noise sources over and above those which form part of the existing environment at neighbouring residential areas (road traffic noise, estate vehicle movements, children playing etc.) and hence no significant impact is expected from this area of the development site.

A positive, significant and permanent impact is expected from the operation of this proposed development.

Impacts on Childcare

Construction Phase

There are existing childcare facilities within 2km of the site as set out above. During the construction phase, the childcare facilities may be temporarily impacted by construction noise, traffic and dust. However, as set out within this EIAR, proposed mitigation measures are included to ameliorate any adverse impacts. The potential effects as a result of the construction works, due to the nearest creche

being over 500m away being reduced to minor/ negligible levels and will only continue for the construction period.

Operational Phase

The proposed developments projected need for childcare spaces has been based on the local demographics, the quarterly national household survey, and national guidelines.

The Childcare Facilities Guidelines for Planning Authorities (2001) provides a standard of one childcare facility with a minimum 20 childcare places per approximately 75 dwellings. This would require a childcare facility of c. 177 no. childcare spaces for the proposed development.

The 2023 Guidelines on Design Standards for New Apartments note that the threshold for the provision of childcare facilities *'should be established having regard to the scale and unit mix of the proposed development and the existing geographical distribution of childcare facilities and the emerging demographic profile of the area'. It also notes that 'one-bedroom or studio type units should not generally be considered to contribute to a requirement for any childcare provision and subject to location, this may also apply in part or whole, to units with two or more bedrooms'*

The proposed unit type and mix breakdown is as follows:

Unit Type	Unit Size	No. of Units	Percentage
Houses	2 bed	100	17%
	3 bed	317	55%
	4 bed	161	28%
Total Houses		**578**	**100%**
Apartments	1 bed	24	27%
	2 bed	51	58%
	3 bed	13	15%
Total Apartments		**88**	**100%**

The total unit mix breakdown for the entire development is as follows:

Unit Size	No. of Units	Percentage
1 Bed	24	4%
2 Bed	151	23%
3 Bed	330	49%
4 Bed	161	24%
Total	**666**	**100%**

Table 4.21 Unit Breakdown for proposed development

Based on an average household size of 2.74 (2022 CSO Census) then the estimated population of the proposed development would be c. 1,825 persons. Based on the 2022 Census figures for the area then the population estimate for the 0-4 age cohort (pre-school at 4.9% of total population for the 3 electoral divisions within 1km & 2km of the subject site) may be c. 89 children for the entire development.

However, it is noted that this figure is likely overestimated, given that a proportion of the development is made up of 1-bed and 2 bed units (27% of the proposed development). Furthermore, as the 2022 Apartment Guidelines recommends, one bed units should be excluded when calculating childcare demand in new developments. Excluding the 1-bed apartments leaves 642 units (c. 1,759 persons). The Guidelines also suggests that in some instances 2-bed units could also be omitted. However, given

that it is likely that some of 2 bed future households of this development are likely to have some childcare needs at various times, it was considered unnecessary to exclude all 2 bed units.

The estimated 0-4 age cohort (4.9%) population for these future family households excluding 1 no. bed units and 50% of 2 bed units would create a demand of c. 76 children (on the basis of a 2.74 average household size).

However, not all 0–4-year-olds are likely to require private childcare given that some will be cared for by parents, guardians, relatives and/or childminders. The Quarterly National Household Survey (QNHS) indicated that in the Mid-East region only 14% of pre-school age children attend private childcare. Applying this percentage to the total estimate of children indicates that c. 11 no. childcare spaces are needed, assuming that each residential unit has children in the 0-4 age category.

Applying a more conservative proportion of 50% of the household requiring private childcare would result in an estimated demand of c. 38 places. The above calculations are summarised in the Table 9 below.

	2001 Guidelines	2023 Apartment Guidelines	2023 Apartment Guidelines
	All units	Without 1 beds units	Only 50% 2 bed units
Calculation based on 2001 Guidelines			
No. of units	666	642	567
2001 Guidelines (20 no. spaces/75 no. units)	177	171	151
Refined estimate based on population analysis as advised in the 2020 Apartment Guidelines (2.74 per household, assuming a higher household ratio)			
Total Population generated	1,825	1,759	1,554
Population 0-4 (4.9% of Pop)	89	86	76
Estimate based on inclusion of Quarterly National Household Survey Findings for Private Childcare Demand in Mid-East Region			
Total Requiring Childcare (14%)	12	12	11
Worst case scenario total Requiring Childcare (50%)	45	43	38

Table 4.22 Calculations for the number of childcare spaces required for the proposed development

From the above section the uppermost requirements the proposed development will require is approx. 177 no. childcare spaces following the 2001 guidelines. However, these guidelines are somewhat outdated when reviewing recent guidelines such as the 2023 Apartment Guidelines and population projections based on the 2022 CSO Census. It is submitted that there will be sufficient capacity in the proposed childcare facility as part of the scheme and will cater for the estimated demand arising from the proposed development. The proposed creche measures c.1,095sqm. The proposed development will be self-sufficient in terms of childcare space requirements.

In addition, it is considered that a portion of childcare need requirements generated by the proposed development can also be readily accommodated in the vicinity of the subject site where there are 16 no. existing and operational childcare facilities within a 2 km radius with a capacity of 9 no. spaces throughout childcare facilities in EDs Arklow No. 1 Urban, Arklow No. 2 Urban, Kilbride and Arklow Rural in 2024/25 according to Pobal. The table below highlights key statistics in relation to childcare services in the local catchment area in 2024/25.

Electoral Division	Number of Services	Enrolments	Vacant Places
Arklow No. 1 Urban	8	312	5
Arklow No. 2 Urban	5	136	3
Arklow Rural	2	98	1
Kilbride	2	53	2
Total	**17**	**599**	**11**

Impacts on Schools

Construction Phase

During the construction phase of development there will be minimal impact on the surrounding schools within 1km of the site. It is also noted that a new Educational Campus has been granted permission within the Kilbride Masterplan lands by the Department of Education (Ref. 22/213) and which will comprise a 2-storey, 16 classroom primary school (c. 400 primary school places) and a 3-storey post primary school for 400 students. There is sufficient distance to result in any potential impact being significantly reduced to negligible/ minor impact. All impacts are the subject of mitigation measures which will further reduce the impact If any school is impacted, it will be temporarily negligibly/ negatively impacted by construction noise and dust. However, any impact will be of short duration and will be mitigated appropriately.

Operational Phase

The 2022 census indicates the share of population in the Primary School (5-12) and Post Primary School (13-18) years. This percentage share was used to estimate the number of primary and post-primary school children the proposed development would generate.

An analysis of the 2022 Census information shows that the total population for the local area was 14,318 people, of which 1,744 were of primary school age (5-12) and 1,267 were of post-primary school age (13-18). This equates to approximately 12% of the population as primary school age and 9% as post-primary school age.

Local Area Catchment	Number of People	% Total 2022 Population
Primary School Age (5-12)	1,744	12%
Post Primary School Age (13-18)	1,267	9%%
Total 2022 Population	14,318	21%

Table 4.13 Breakdown of 2022 Local Population

The national household size, according to the 2022 census, is 2.74 people. The proposed residential development contains 666 no. units and will have an expected population of c. 1,825 when mature. Using the percentages explained above, the estimated maximum primary school going population that would be generated by the development is c. 219 and c. 164 students for post-primary.

Projected School Aged Population of Development	Projected Population when Mature
Total Population	1,825
Primary School Age (5-12)	219
Post Primary School Age (13-18)	164

Table 4.14 Projected School Aged Population of Development

Furthermore, if in line with the Apartment Guidelines 2023 only half of the 2 beds are considered and all 1 beds were excluded then the total population of school aged children is further reduced.

Projected School Aged Population of Development	Projected Population when Mature
Total Population	1554
Primary School Age (5-12)	186
Post Primary School Age (13-18)	140

Table 4.23: Projected School Aged Population of Development when considering only half of the 2 beds and excluding all 1 beds as per the Apartment Guidelines 2023

While any of these forecasts are equally valid, assuming the highest figures based on all the units proposed included in the school population forecast there is sufficient spaces in the existing schools based on data provided by the schools themselves to accommodate the proposed development. However, the proposed development will not generate this level of demand within the short term given that the development will be constructed in a phased manner.

As demonstrated in the baseline section above there is sufficient capacity within the schools in the area to cater for the increased demand expected from the proposed development by the time of occupation. As indicated above in the baseline section, there has been a steady decline in primary school figures since 2019/2020 in the area according to the DOE published enrolment figures. It is considered that there will be sufficient capacity within the schools in the area to cater for the increased demand expected from the proposed development by the time of occupation as predicted based on the Census 2022 estimates.

It is considered that the proposed additional population which will be delivered as a result of this development, and the subsequent developments as envisaged by the Action Area Plan, will enable these schools to maintain their pupil numbers and continue to be viable schools.

We note that enrolment levels in schools change over time and national enrolment projections estimate decreasing enrolment numbers first at primary school and 5 years later at post primary school. These national projections are carried out by the Department of Education.

The Department of Education published *Projections of Full-Time Enrolment 2021-2040* in November 2021 which outlined that "*Enrolments in primary schools in Ireland in 2020 stood at 561,411 down by almost 6,000 on 2019 (567,716).* ***Enrolments are now projected to fall over the coming years under all scenarios, and under the M1F2 scenario will reach a low point of 440,551 by 2033. This is 120,860 lower than today's figure****. Enrolments will rise again thereafter and are projected to stand at 474,888 by 2040, a rise of some 34,300 over the seven years 2033 to 2040."*

Section 5 of the DOE report further states that: "*There was very little difference between the projected and the actual figure in 2020 by M2F2, i.e., an under-projection of 364 pupils at primary level and of 1,075 pupils at second level. At primary level this difference is mainly due to the combination of two factors: the inward migration of 0–4-year-olds was higher than projected, while the number of children participating in the ECCE scheme increased leading to a fall in the enrolment rate of 4 year olds in school (down from 0.46 in 2018 to 0.44 in 2019) [4]. As a result, the actual enrolment figures were slightly higher compared to the projected ones. The model has been updated accordingly."*

Even following the projected increase after 2033, the high of 2040, will be 474,888, which is 92,828 pupils less than the 2019 figures. In terms of the post primary school pupil projections, it is expected to peak in 2026 with a continuous fall in the number of students, thereafter, falling to 2033.

It is noted that these national projections may not be precisely applicable to each local area, although as a general guidance they are informative. Following these projections, it can be assumed that the increase in primary school aged children caused by the development will be lower than the c. 108 children as projected above, at any one time.

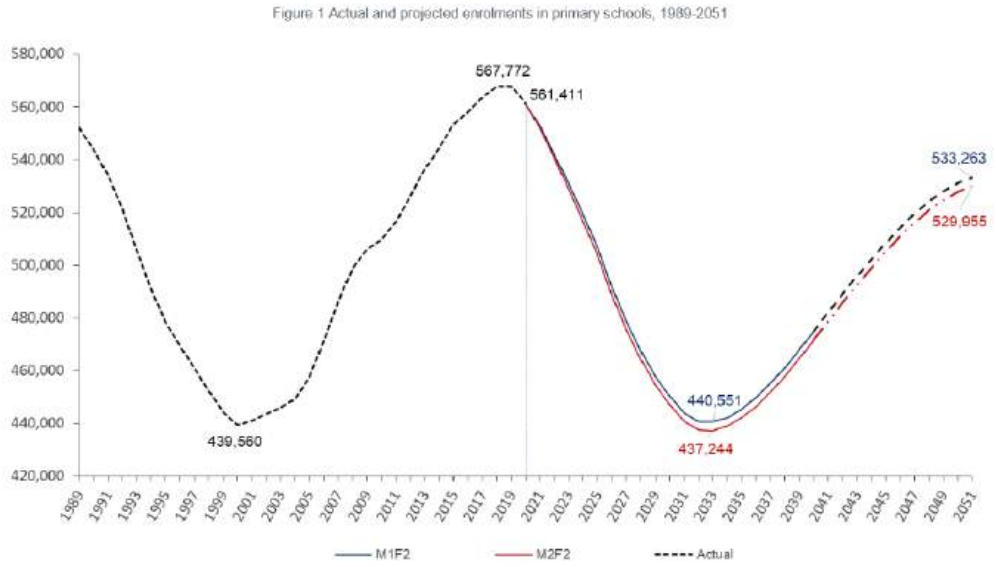


Figure 4.13 Projected Primary School Enrolment. Source: Dept. of Education

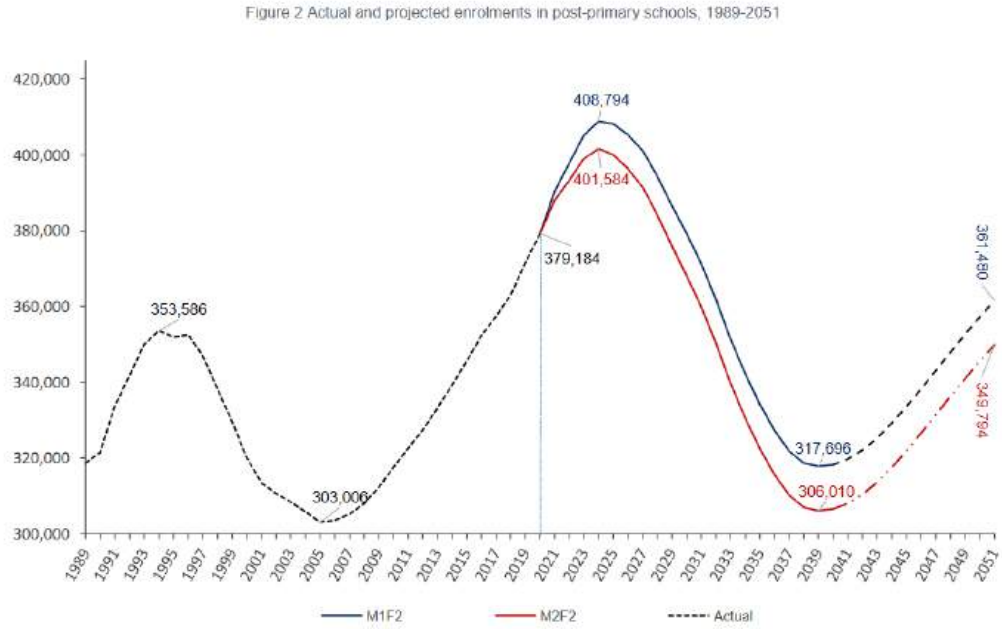


Figure 4.14 Projected Post-Primary Enrolment. Source: Dept. of Education

Accordingly, the proposed development will have a **positive, indirect, significant impact** on population and human health with regard to primary and post primary school provision.

Risk of Major Accidents or Disasters

Construction Phase

The proposed development will not give rise to any impacts related to a major accident or disasters during the construction phase. The accompanying Construction and Environment Management Plan prepared by Altemar Ltd outlines measures that will ensure construction practices will limit the risk of

accidents during the construction phase. Furthermore, throughout the construction phase standard and regulated construction practices will be employed.

The works proposed in proximity to public roadways and footpaths will also be governed by appropriate safety procedures reducing any risk of a major accidents in public areas.

Operational Phase

The proposed development is not considered to be vulnerable to major accidents or disasters, and anticipated impacts are negligible. The site access, surrounding highway and pedestrian network of the proposed development has been designed to be DMURS compliant and a Road Safety Audit has also been carried out to ensure any major accident is avoided.

The subject site is located 1.3km from the Sigma Aldrich facility which is designated as a 'Seveso site'. The Seveso III Directive (2012/18/EU) was adopted on 4th July 2012 and came into force on 13th August 2012. The Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (the "COMAH Regulations"), implements the Seveso III Directive in Ireland.

Under the Planning and Development Act, 2000 (as amended) and Planning and Development Regulations, 2001 (as amended), it is obligatory for planning authorities to consult with the HSA with regards to the siting, development, and modifications within HSA prescribed consultations of each Seveso establishment. It is understood that Wicklow County Council have previously consulted within the HSA as part of the preparation for the 2018-2024 LAP (and previous LAPs) and this informed the zoning and designation of lands for development including the zoning of the Kilbride lands for significant residential and mixed-use development. Having regard to the established zoning of the site in this regard, and noting the location of much of the west of Arklow town within the same Seveso consultation zone area (and which has experienced residential development and population growth in recent decades) it is not considered that the development will be vulnerable as a result of the Seveso establishment.

4.7 Potential Cumulative Impacts

Overall, the cumulative impacts of the proposed development on the population and human health are envisaged to be positive. Currently the site is located on former agricultural lands, adjacent to existing housing estates. The proposed development comprises a mix of houses and apartments and will also deliver a new creche and generous areas of public open space including children's play grounds, enhanced planting and enhancements to the biodiversity of the area. the proposal will also provide a boardwalk linking the site to Arklow town centre. Existing development in the area are not considered to give rise to significant cumulative impacts in combination with the proposed development.

The significant new population will contribute to the economic viability of the area, increasing in spending and a range of new services and facilities and new open spaces will add to the viability and vibrancy of the area. The existing services and facilities will tap into the expanding population and invest more. Schools, shops and proposed public transport provision in the surrounding are etc. will benefit from the increase in population.

The proposed new pedestrian and cycle linkages proposed, including the boardwalk, will connect the site to surrounding neighbourhoods and Arklow town centre. These linkages will also be of importance

to the new school, for which permission has been granted under Ref. 22/213. Therefore, the cumulative impact of the proposed development will be long term and positive particularly with respect to the benefits that improved recreation and amenity infrastructure will bring to human health. New and existing residents will benefit from increased opportunities for recreation arising from the delivery of the high quality public open spaces and the amenity provision to be delivered as part of the proposed development.

The potential cumulative impacts of the proposed development on population and human health have also been considered in conjunction with the planned changes to the surrounding area.

The cumulative impact of the development of adjacent lands within the APP3 lands will be the resulting rise in population, in line with local planning policy for Arklow. This impact will be long term and positive in the context of the development zoning objectives for the subject site, and wider local, regional, and national planning policy due to the strategic location of the lands and their proximity to existing and proposed high-quality public transport network, social and community services. The cumulative impact of the full development of the AAP3 lands will enhance the economic viability of the area, increasing spending and support for existing and planned businesses.

4.8 Mitigation Measures

Construction Phase

A Construction and Environmental Management Plan (CEMP) has been prepared by Altemar Ltd and will be implemented during the construction phase to reduce the detrimental effects of the construction on the environment and local population and is submitted with this application.

Construction noise and vibration impacts are expected to vary during the construction/ site clearance phase depending on the distance between the activities and noise sensitive buildings and that best practice control measures will ensure impacts at off-site noise sensitive locations are minimised. These are outlined in detail in Chapter 8.

Chapter 11 Traffic and Transportation and the CEMP submitted with the application include traffic management measures to minimise the impact of construction traffic.

These measures are put forward to avoid any significant negative environmental impacts on the population and human health. No additional mitigation measures are considered necessary.

Operational Phase

The proposed development has been designed to avoid negative impacts on population and human health through the provision of various physical and social infrastructure as part of the development as are outlined in Chapter 3 of this EIAR. Compliance with the proposed design and layout will be a condition of any permitted development. Monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission. Furthermore, measures outlined in the chapters of this EIAR which address other environmental matters such as water, air quality and climatic factors, landscape and visual impact and noise sufficiently address monitoring requirements.

Chapter 9 Climate and Air Quality notes the proposal includes operational phase mitigation by design measures to minimise the impact on air quality and climate. These include efficient glazing, thermal insultation, and the inclusion of electric car charging points.

Chapter 11 Traffic and Transportation has been prepared for the proposed development with the aim of encouraging sustainable travel practices for all journeys. Increased sustainable travel practices will also reduce the negative impact of traffic emissions on the air quality.

No additional mitigation measures are considered necessary.

4.9 Predicted Impacts

Construction Phase

Any adverse likely and significant environmental impacts will be avoided by the implementation of the remedial and mitigation measures proposed throughout this EIAR.

Chapter 8 Noise and Vibration notes during the construction phase of the project there is the potential for short-term noise effects on nearby noise sensitive properties due to noise emissions from site activities. The application of binding noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum as far as practicable. Likely noise and vibration effects during the construction phase will be local, negative, short-term and moderate.

Chapter 9 Climate and Air Quality notes that once the dust minimisation measures outlined in Chapter 9 and Appendix 9.2 are implemented, the impact of the proposed development in terms of dust soiling will be short-term, negative, localised and imperceptible at nearby receptors.

Chapter 11 Traffic and Transportation notes that provided the mitigation measures and management procedures outlined in the Construction Environmental Management Plan are incorporated during the Construction Phase, the residual impact upon the local receiving environment is predicted to be temporary in the nature and slight in terms of effect.

Positive impacts are likely to arise due to an increase in employment and economic activity associated with the construction of the proposed development.

The overall predicted likely and significant impact of the construction phase will be short-term, temporary and neutral.

Operational Phase

The proposed development will contribute to further growth and expansion of the existing neighbourhood to the west of the subject site and employment/community lands to the east contributing to the existing and future populations.

Chapter 8 Noise and Vibration notes that the predicted impact, once mitigation measures are implemented, of additional traffic, the mechanical plant, and the creche will be of neutral, imperceptible, and long-term impact.

Chapter 9 Climate and Air Quality notes that the air dispersion modelling has shown that emissions of air pollutants are significantly below the ambient air quality standards which are based on the protection of human health, impacts to human health are long-term, negative and imperceptible.

Overall, the predicted impacts of the Operational Phase are considered to be long term and positive to population and human health.

4.10 'Do Nothing' Scenario

A 'do nothing' scenario will result in the subject site remaining undeveloped as a greenfield site. The environmental receptors set out in this EIAR would in likely remain unchanged while the potential for any significant adverse environmental impacts arising from the proposed development would not arise, including from the construction and operation of the proposed development.

More significantly however, would be that this zoned development site would remain undeveloped and underutilised and would not fulfil the local, regional and national planning policy objectives.

4.11 Worst Case Scenario

The development is partially completed, and all of the proposed infrastructure is not delivered. This would potentially result in some of the significant adverse environmental impacts occurring or not being mitigated appropriately. It will also result in this zoned development site being underutilised and therefore not fulfilling the local, regional and national planning policy objectives.

4.12 Monitoring & Reinstatement

There is no monitoring required during the construction or operation of the proposed development in relation to population and human health. The monitoring measures required for the aspects of water, air quality and climate, noise, landscape and visual impact, etc provides an appropriate response in this instance. There are no reinstatement works proposed for the proposed site.

4.13 Difficulties in Compiling Information

As outlined above, the census data that informed this chapter's analysis dates from the period 2016 to 2022, which is now three years old and could be considered out of date. This was a minor limitation in compiling the population data. It is not anticipated that any future revision of figures/ data would result in a significant impact upon the findings of this assessment, or the conclusions reached.

4.14 References

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Department of Education, 2020, *Projections of Full Time Enrolment Primary and Second Level 2020-2038*. Available online at: https://www.gov.ie/en/collection/projections/

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5. Biodiversity

5.1 Introduction

The biodiversity assessment has been undertaken by Altemar Limited. It assesses the biodiversity value of the proposed development area and the potential impacts of the development on the ecology of the surrounding area and within the potential zone of influence (ZOI). Construction and operational phase control measures, in addition to monitoring measures are proposed, to minimise potential impacts of the proposed development and to improve the biodiversity potential of the proposed development area post construction.

The programme of work in relation to biodiversity assessment was designed to identify and describe the existing ecology of the area and detail designated sites, habitats or species of conservation interest that could potentially be impacted by the proposed development. It also assesses the significance of the likely impacts of the scheme on the biodiversity elements, and designs mitigation measures to alleviate identified impacts. Details of the mitigation measures are contained within the relevant chapters of the EIAR and these measures in addition to the phasing of the project are contained in the Construction Management Plan (CMP), which has been prepared by DOBA Consulting Engineers.

A separate AA Screening, in accordance with the requirements of Article 6(3) of the EU Habitats Directive, has been produced to identify potential impacts of the development on Natura 2000 sites, Annex species or Annex habitats. It concludes that ''*Having taken into consideration foul and surface water drainage from the proposed development, the distance between the proposed development to designated conservation sites, lack of direct hydrological pathway or biodiversity corridor link to conservation sites, and the dilution effect with other effluent and surface runoff, it is concluded that the proposed development would not give rise to any significant effects to designated sites. The construction and operation of the proposed development will not impact on the conservation objectives of qualifying interests of European sites.*''

5.2 Methodology

Desk study

A desk study was undertaken to gather and assess ecological data prior to undertaking fieldwork elements. Sources of datasets and information included:

- The National Parks and Wildlife Service
- National Biological Data Centre
- Satellite, aerial and 6" map imagery

A pre-survey biodiversity data search was carried out. This included examining records and data from the National Parks and Wildlife Service (NPWS), National Biological Data Centre (NBDC) and the Environmental Protection Agency (EPA), in addition to aerial, 6-inch maps and satellite imagery. A Phase I habitat survey of the site was undertaken within the appropriate seasonal timeframe for terrestrial fieldwork. Field surveys were carried out as outlined in Table 5.1. All surveys were carried out in the appropriate seasons. No limitations are foreseen in relation to the surveys on site.

Field Surveys

Surveys on site were carried out by Bryan Deegan, Frank Spellman, Jack Doyle and Emma Peters of Altemar Ltd.

Bryan Deegan is the managing director of Altemar. Bryan is an environmental scientist, aquatic biologist and marine biologist with 30 years' experience of ecological survey in Irish terrestrial and aquatic environments, providing ecological services to the State, Semi-State and industry. Bryan Deegan (MCIEEM) holds a MSc in Environmental Science, BSc (Hons.) in Applied Marine Biology, NCEA National Diploma in Applied Aquatic Science and a NCEA National Certificate in Science (Aquaculture).

Frank (BSc. Zoology & MSc. Zoology) has extensive experience in carrying out a wide range of fauna surveys as both a sub-contractor and employee for environmental consultancies and organisations in Ireland and the US. These include both roving and static acoustic bat surveys, terrestrial non-avian mammal surveys, breeding/wintering bird surveys, and freshwater ecology surveys. Frank has been lead ornithologist on numerous development projects within Ireland carrying out full wintering bird and breeding bird assessments.

Emma Peters (BSc (Hons.) Environmental Science) is a skilled ecological assessor with aptitude for flora identification, invasive species and bat detection through static detector surveys, dusk emergence, and dawn re-entry surveys. Emma has been the lead ecologist in 30+ projects responsible for mammal tracking, camera trapping, wintering bird, breeding bird, bat surveys, flora and habitat mapping.

Jack Doyle (MSc Sustainable Environments) has previous experience in carrying out a wide range of fauna surveys, including both roving and static acoustic bat surveys, terrestrial non-avian mammal surveys, and breeding/wintering bird surveys.

The 2020/2021 wintering bird assessment was carried out by Hugh Delaney. Hugh Delaney is a freelance ecologist (Birds primarily) with an experienced background in bird surveying on numerous sites with ecological consultancies over 10+ years. Hugh, a lifelong birder, is local to the Dun Laoghaire-Rathdown area in Dublin and is especially familiar with bird life and its ecology in the environs going back over 30 years.

Survey	Surveyor	Dates
Flora and Habitat	Bryan Deegan (MCIEEM) Emma Peters (Altemar)	1st September 2019, September 26th 2020, 10th August 2021, 19th May 2022 11th September 2023 & 10th September 2024 & 9th April 2025
Bat Survey	Bryan Deegan (MCIEEM) Emma Peters (Altemar) Jack Doyle (Altemar), Frank Spellman (Altemar) & Emma Peters Bryan Deegan (MCIEEM), Frank Spellman, Jack Doyle & Emma Peters	1st September 2019, 2nd October 2020, 22nd August 2021 (14th August 2020- 22nd August 2020 & 10th August 2021-14th August 2021 (Static Detector) 11th September 2023 10th and 12th September 2024 9th of April 2025 9th May 2025
Mammal	Bryan Deegan (MCIEEM) Dr Chris Smal (MCIEEM) Frank Spellman	27th March 2020 20th and 21st March 2021 10th March 2022 11th September 2023 24th June 2024, 10th September 2024 9th April 2025

Survey	Surveyor	Dates
Wintering Birds 2020/2021	Hugh Delaney (Ornithologist)	October 23rd 2020, October 30th 2020, November 10th 2020, November 27th 2020, December 11th 2020, December 19th 2020, January 11th 2021, January 25th 2021, February 6th 2021, February 26th 2021, March 9th 2021.
Wintering Birds 2024/2025	Emma Peters (Altemar) & Jack Doyle (Altemar)	17th, 24th + 25th of October 2024, 8th + 22nd of November 2024, 10th + 18th of December 2024, 9th + 30th of January 2025, 20th + 28th of February 2025 and the 25th of March 2025.
Breeding Birds	Frank Spellman (Altemar), Emma Peters (Altemar) & Jack Doyle (Altemar)	29th May, 10th June and 24th June 2024 23rd April and 9th May 2025

Table 5.1: Field survey dates

It should be noted that bat surveys were also carried out along the Avoca River Estuary and in the eastern portion of the Arklow Town Marsh in 2016 and 2017 by Brian Keeley of Wildlife Surveys Ireland, as part of the Arklow WwTP project and the Arklow Flood Relief Scheme.

5.3 Receiving Environment

The sites primarily consist of agricultural grassland and hedgerows with numerous large trees both internally and around the perimeter. Of particular note, the development site traverses through Arklow Town Marsh pNHA to the south of the site and across the Avoca River Estuary. In addition, a small tributary of the Avoca River is located along the eastern boundary which ultimately outfalls to the Avoca River Estuary.

ZONE OF INFLUENCE

As outlined in CIEEM (2018) 'The 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries.' In line with best practice guidance an initial zone of influence was originally set at a radius of 2km for non-linear projects (IEA, 1995).

Zone of Influence (ZoI) is the 'effect area' over which changes could give rise to potentially significant impacts. In order to define the extent of the study area for ecological assessment, all elements of the project were assessed and reviewed in order to identify the spatial scale at which ecological features could be impacted. The project would involve instream works, excavations and construction, which may impact beyond the site through noise, dust, light and downstream impacts. Standard construction phase controls will need to be implemented to limit the potential impact of the proposed development into the surrounding environment including measures to protect from Arklow Town Marsh pNHA and downstream impacts to the Avoca River. The potential ZOI of the construction phase of the project was deemed to be the site within the site outline, nearby sensitive receptors including the Arklow Town Marsh pNHA and the Avoca River which borders the site with potential for downstream impacts. However, the ZOI of the operation of the proposed development would be the immediate area of the proposed development site.

DESIGNATED SITES

As can be seen from Figures 5.1 (SAC's within 15km), 5.22 (SPA's within 15km (none)), 5.3 (NHA and pNHA within 15km), 5.4 (Watercourses proximate to the site.), there is one Natura 2000 site (Buckroney-Brittas Dunes and Fen SAC 4.1 km) within 5km. The distance and details of all the conservation sites within 15km of and those with the potential for direct or indirect pathways to the proposed development beyond 15km are seen in Table 5.2a and Table 5.2b. The nearest designated site (Arklow Town Marsh pNHA) is located within the site outline to the south of the site.

Surface water drainage from the proposed development will discharge to a small tributary of the Avoca River along the eastern site boundary. This watercourse traverses through Arklow Town Marsh pNHA prior to outfalling into the Avoca River Estuary and ultimately the Irish Sea marine environment. There is therefore, a weak indirect hydrological pathway to European sites located along the Wicklow Coast (namely, Buckroney-Brittas Dunes and Fen SAC, Kilpatrick Sandhills SAC & Magherabeg Dunes SAC) via surface water drainage.

Site Code	NATURA 2000 Site	Distance	Direct Pathways
Special Areas of Conservation			
IE001742	Buckroney-Brittas Dunes and Fen SAC	4.1 km	No
IE000729	Kilpatrick Sandhills SAC	6.9 km	No
IE000781	Slaney River Valley SAC	13.3 km	No
IE001766	Magherabeg Dunes SAC	13.8 km	No
Special Protection Areas			
No Special Protection Areas (SPAs) within 15km of the proposed development			

Table 5.2: Conservation sites within 15km of the proposed site.

Status	*Site Name*	*Distance*
Proposed NHA	Arklow Town Marsh	Within the site boundary
Proposed NHA	Arklow Sand Dunes	1.1 km
Proposed NHA	Avoca River Valley	1.9 km
Proposed NHA	Buckroney-Brittas Dunes and Fen	3.9 km
Proposed NHA	Arklow Rock-Askintinny	3.2 km
Proposed NHA	Kilpatrick Sandhills	7.6 km
Proposed NHA	Kilgorman River Marsh	10.1 km
Proposed NHA	Ballymoney Strand	13.2 km
Proposed NHA	Magherbeg Dunes	13.7 km
Proposed NHA	Glenealy Woods	14.9 km

Table 5.3: Conservation sites within 15km of the proposed site.

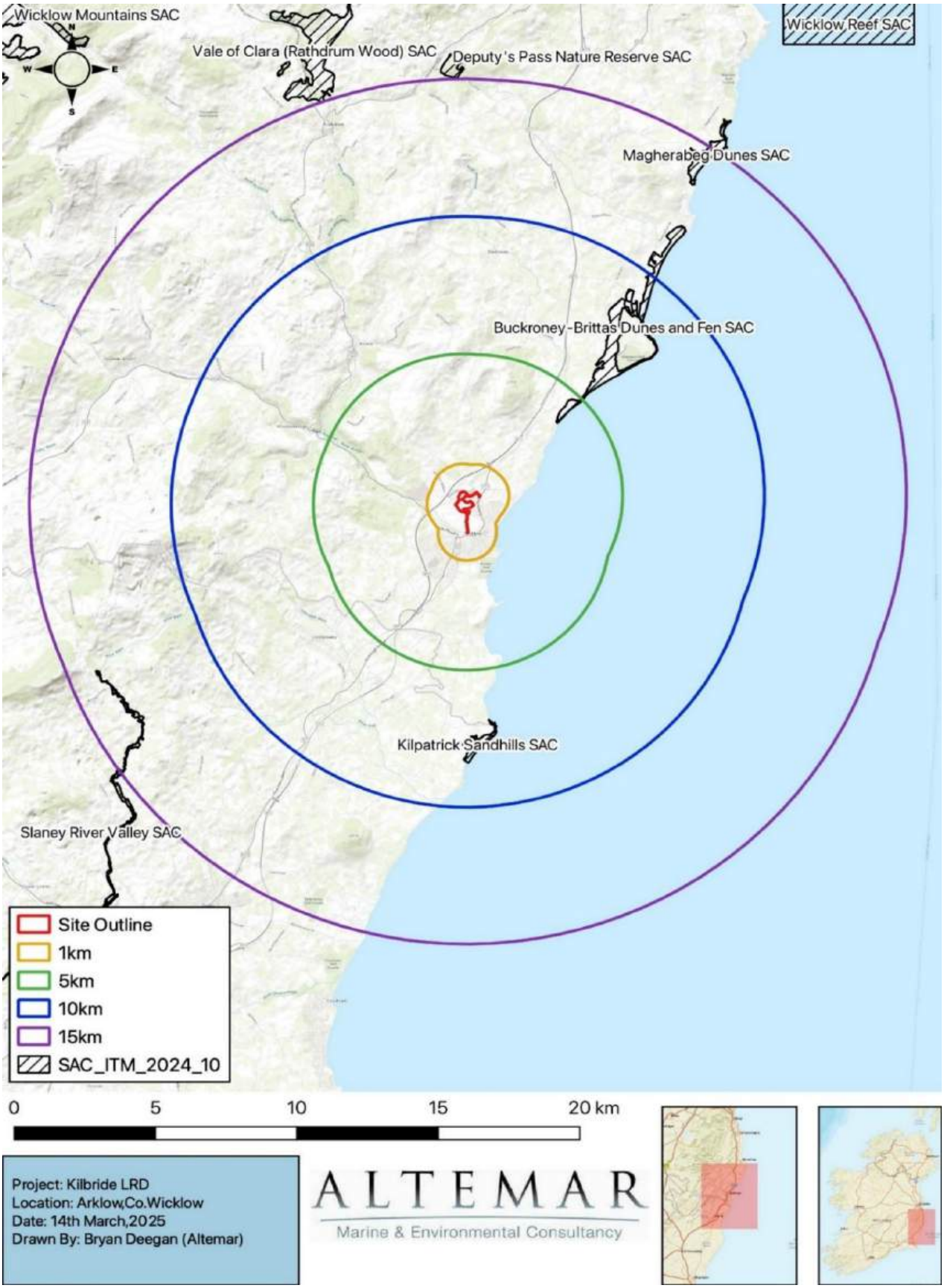


Figure 5.1: SACs within 15km of Proposed Development site

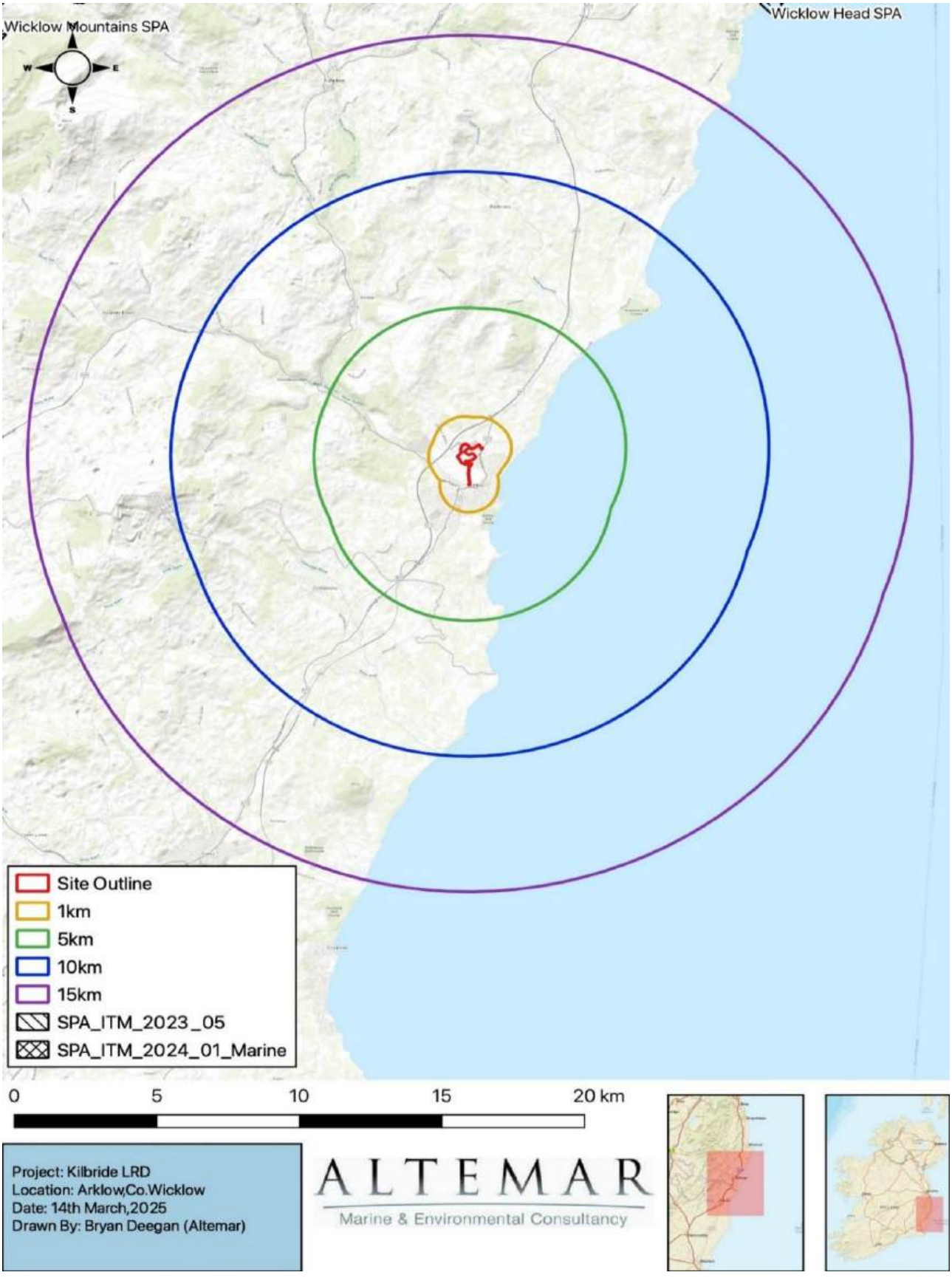


Figure 5.2: SPAs within 15km of Proposed Development site (none)

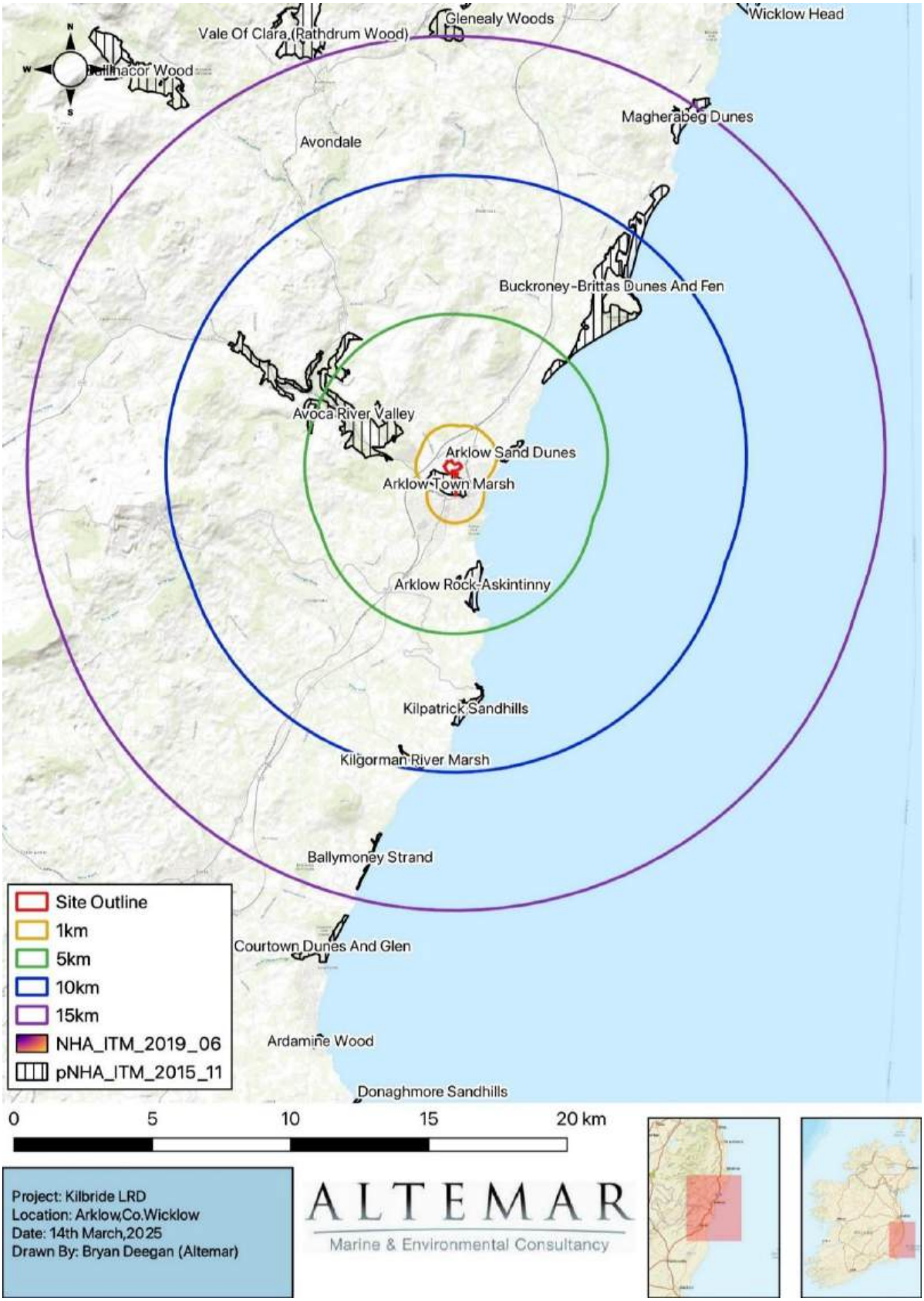


Figure 5.3: pNHAs & NHAs within 15km of Proposed Development site

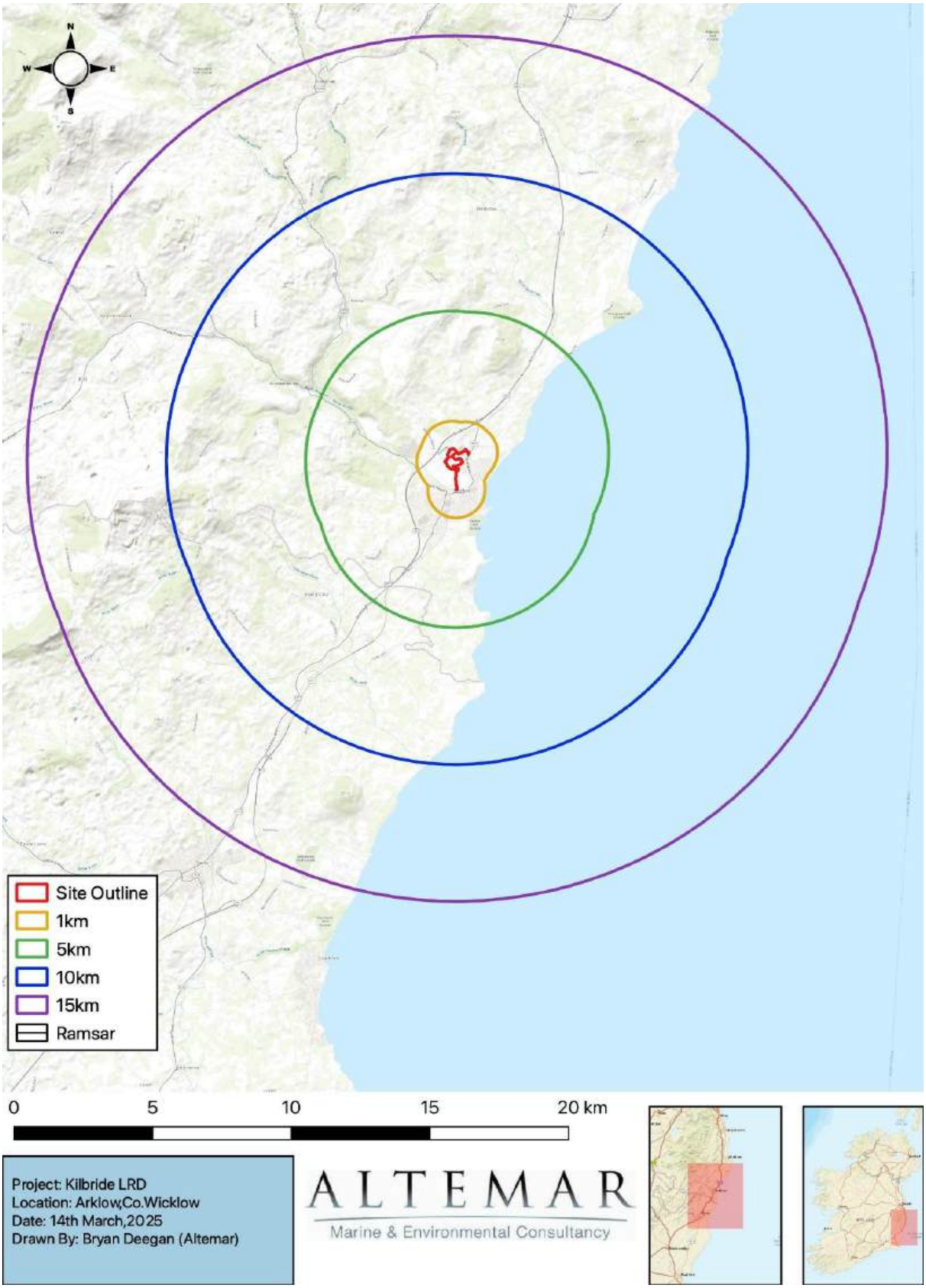


Figure 5.4: Ramsar sites within 15km of Proposed Development site (none)

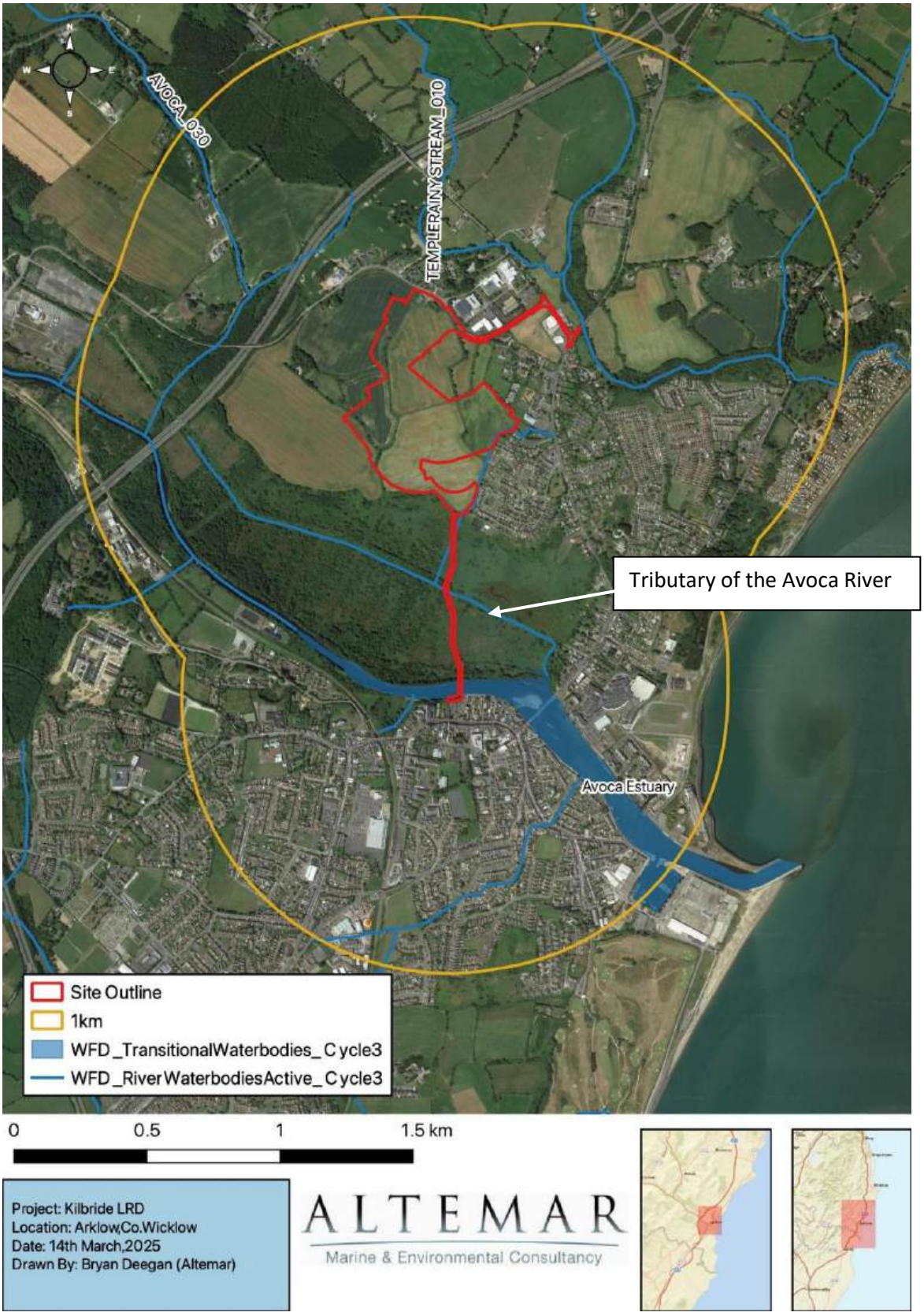


Figure 5.5: Watercourses within 1km of the Proposed Development site

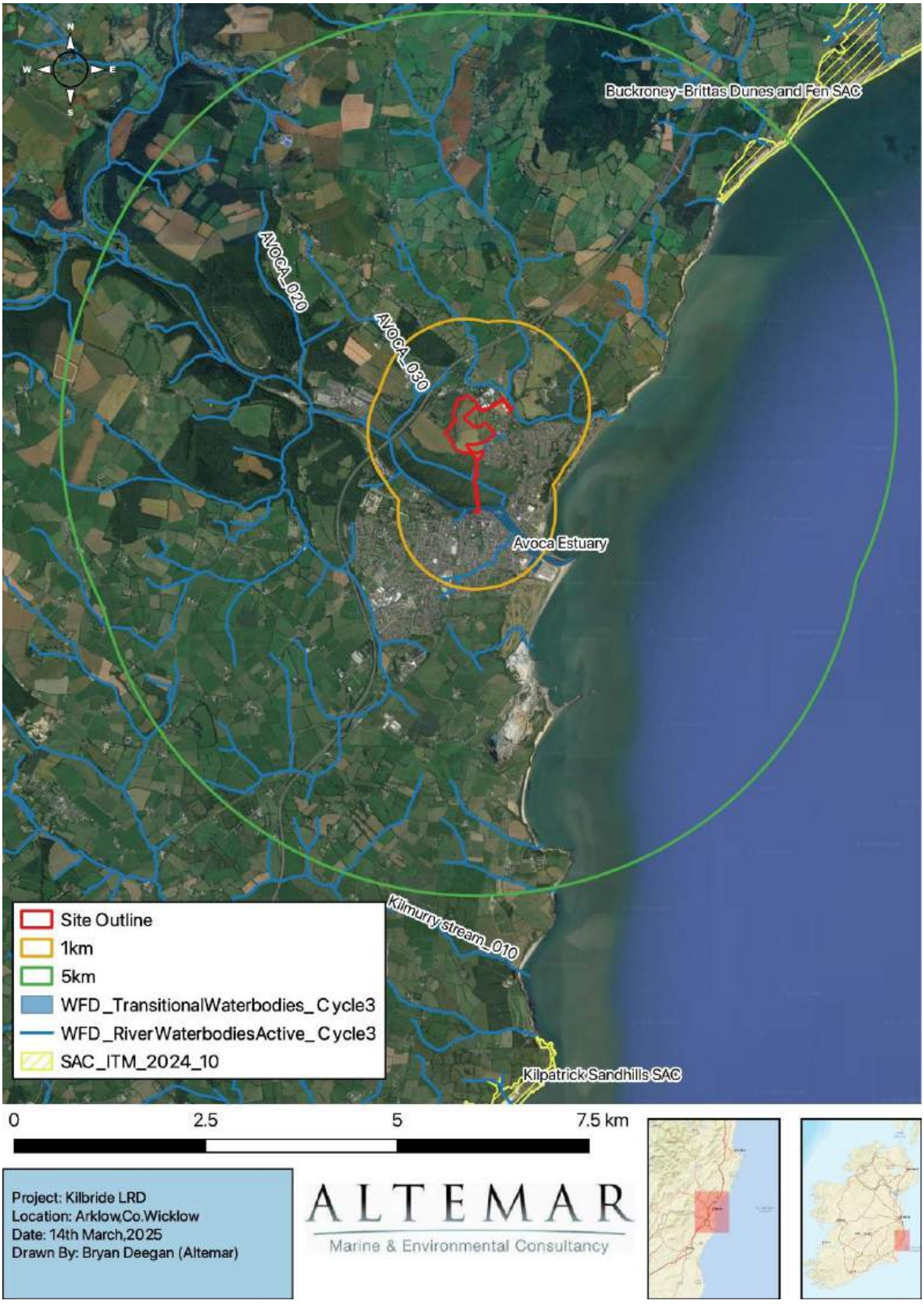


Figure 5.6: Watercourses and SACs within 5km of the proposed development

Biodiversity Records

The National Biodiversity Data Centre's online viewer was consulted to determine the extent of biodiversity and/or species of interest in the area. An assessment of the site-specific area was carried out and it recorded no species of interest within the site area. Following this, a 2km^2 grid was assessed (T27M). Table 5.4 provides a list of all species of interest recorded in the 2km^2 grid area.

Species of Interest (T27M)
Barn Swallow *(Hirundo rustica),*Black-headed Gull *(Larus ridibundus),*Common Coot *(Fulica atra),*Common Goldeneye *(Bucephala clangula),*Common Grasshopper Warbler *(Locustella naevia)*,Common Kingfisher *(Alcedo atthis),*Common Linnet *(Carduelis cannabina),*Common Pheasant *(Phasianus colchicus),*Common Pochard *(Aythya ferina),*Common Snipe *(Gallinago gallinago),*Common Starling *(Sturnus vulgaris),*Common Wood Pigeon *(Columba palumbus),*Eurasian Curlew *(Numenius arquata),*Eurasian Oystercatcher *(Haematopus ostralegus),*Eurasian Reed Warbler *(Acrocephalus scirpaceus),*Eurasian Wigeon *(Anas penelope)*,European Golden Plover *(Pluvialis apricaria),*Greylag Goose *(Anser anser),*Herring Gull *(Larus argentatus),*House Martin *(Delichon urbicum),*House Sparrow *(Passer domesticus),*Lesser Whitethroat *(Sylvia curruca),*Mallard *(Anas platyrhynchos),*Mew Gull *(Larus canus),*Mute Swan *(Cygnus olor),Northern* Lapwing *(Vanellus vanellus),*Red Kite *(Milvus milvus),*Sky Lark *(Alauda arvensis),*Tufted Duck *(Aythya fuligula),*Water Rail *(Rallus aquaticus),*Black Currant *(Ribes nigrum),*Japanese Knotweed *(Fallopia japonica),*Sycamore *(Acer pseudoplatanus),*Small Blue *(Cupido minimus),*Colletes *(Colletes)* similis,Large Red Tailed Bumble Bee (*Bombus (Melanobombus) lapidarius),*Common Porpoise *(Phocoena phocoena),*Jenkins' Spire Snail *(Potamopyrgus antipodarum),*Common Lizard *(Zootoca vivipara),*Daubenton's Bat *(Myotis daubentonii),*Eurasian Badger *(Meles meles),*Lesser Noctule *(Nyctalus leisleri),*Pipistrelle (*Pipistrellus pipistrellus sensu lato*),Soprano Pipistrelle (*Pipistrellus pygmaeus),*West European Hedgehog *(Erinaceus europaeus)*

Table 5.4: Species recorded by NPWS within 2km2 grid (T27M)

An assessment of files received from the NPWS (Code No. 2022_120) which contain records of rare and protected species and grid references for sightings of these species was carried out as part of this Biodiversity Chapter. No rare and protected species were noted on site in fine resolution or in 1km^2 grid in which the site is located. The following table provides a summary of the species identified, the year of identification, survey name and location.

Sample ID	Species Name	Survey Name	Sample Year
1337	Common Lizard (*Lacerta vivipara*)	Lizards IBRC Data. 500m to the SE	1972
5054	Greater Broomrape (Orobanche rapum-genistae)	NPWS Rare/Threatened Plants Database 2km to the west.	1948

Table 5.5: Recorded species within NPWS Records proximate to the site

Habitats and Species

A site assessment was carried out numerous dates between 2019 and 2025. Habitats within the proposed site were classified according to Fossitt (2000) (Figure 16) based on the most recent site visit on the 9th of April 2025.

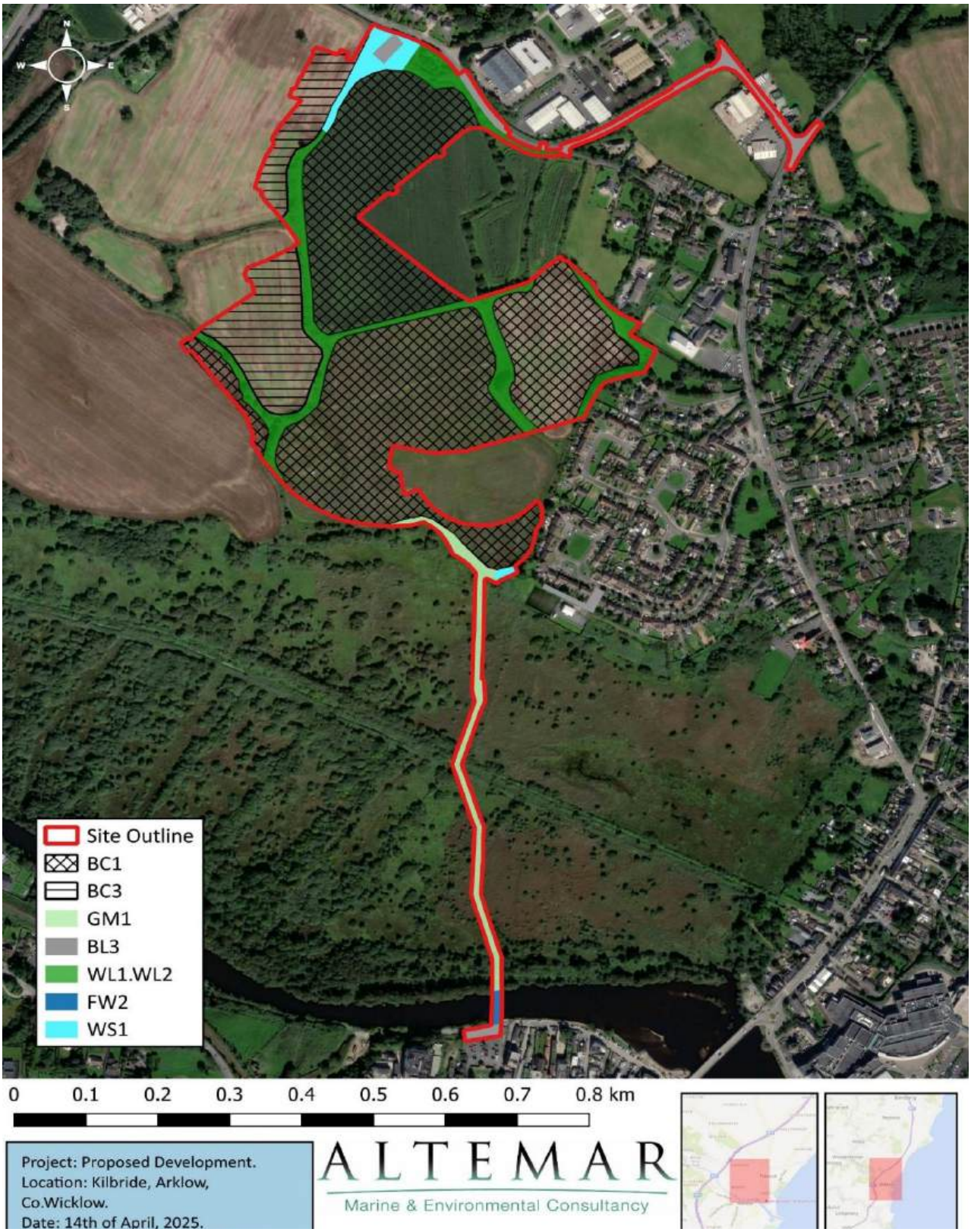


Figure 5.7: Habitats of subject site according to Fossitt (2000).

BC1- Arable Crops/ BC3- Tilled land

The majority of the site consisted of crop fields of mainly harvested maize (*Zea mays*) and *brassica*. The northern portion of the site consists tilled fields. Although highly managed, a good species diversity was noted on the edges of the fields. Species noted within this habitat included thistles (*Cirsium spp.*) including prickly sow-thistle (*Sonchus asper*) and smooth sow-thistle (*Sonchus oleraceus*), common chamomile (*Chamaemelum nobile*), pineappleweed (*Matricaria discoidea),* ribwort plantain (*Plantago lanceolata*), greater plantain (*Plantago major*), nettle (*Urtica dioica*), encroaching brambles (*Rubus fruticosus agg*), cleavers (*Galium aparine*), germander speedwell (*Veronica chamaedrys*), common field speedwell (*Veronica persica*),), broad-leafed dock (*Rumex obtusifolius*), common ragwort (*Jacobaea vulgaris*), meadow buttercup (*Ranunculus acris*), creeping buttercup (*Ranunculus repens*), curled dock (*Rumex crispus ssp. crispus*), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), hoary willowherb (*Epilobium parviflorum*), great willowherb (*Epilobium hirsutum*), silverweed (*Potentilla anserina*), fat hen (*Chenopodium album*), round-leaved cranes-bill (*Geranium rotundifolium*), hedge woundwort (*Stachys arvensis*), common chickweed (*Stellaria media*), hedge mustard (*Sisymbrium officinale),* and equal-leaved knotgrass (*Polygonum arenastrum*).

Plate 5.1: Arable crop field.

Plate 5.2: Tilled field.

WL1/WL2 – Hedgerow/Treeline

Each field was bordered by hedgerows which formed into treelines along the way. The species noted within this habitat included cherry laurel (*Laurocerasus officinalis*), willow (*Salix sp.*), sycamore (*Acer pseudoplatanus*), ash (*Fraxinus excelsior*), brambles (*Rubus fruticosus agg*), hawthorn (*Crataegus monogyna*), elder (*Sambucus nigra*), beech (*Fagus sylvatica*), gorse (*Ulex europaus*), oak (*Quercus spp.*), bracken (*Pteridium aquilinum*), male fern (*Dryopteris filix-mas*), holly (*Ilex aquifolium*), hedge bindweed (*Calystegia sepium),* blackthorn (*Prunus spinosa*), common vetch (*Vicia sativa*) and Atlantic ivy (*Hedera hibernica*). **FW4- Drainage ditches** were noted within the hedgerow habitats throughout the site.

Plate 5.3: Hedgerow/treeline habitat.

WS1 – Scrub

A small number of brambles (*Rubus fruticosus agg*) scrub grew in the centre of the site. The remaining scrub was typically encroaching out from hedgerows and in the marsh habitats.

WD5 – Scattered trees and parkland.

Along the south bank of the Avoca River there was a small number of young trees with some amenity grassland as ground cover.

FW2- Lowland depositing river

Three watercourses exist onsite, the Avoca River, south of the site, a tributary of the Avoca River on the east boundary of the site and a marsh watercourse that flows though the Arklow Town Marsh pNHA.

Plate 5.4: Avoca River with view of north bank into the marsh.

Plate 5.5: View of the North bank of the Avoca River

WD1- Mixed broadleaf woodland

It should note that this habitat is approximately 250 meters outside of the redline. Two areas of woodland were noted on site to the west of the site and in the southwest corner. The tree species noted within this habitat included sycamore (*Acer pseudoplatanus*), ash (*Fraxinus excelsior*), holly (*Ilex aquifolium*), beech (*Fagus sylvatica*), black oak (*Quercus velutina*) and Sitka spruce (*Picea sitchensis*). The ground cover included male fern (*Dryopteris filix-mas*), cleavers (*Galium aparine*), bluebell (*Hyacinthoides non-scripta*), brambles (*Rubus fruticosus agg*), lesser celandine (*Ficaria verna (Ranunculus ficaria)*), and ivy (*Hedera helix*).

Plate 5.6: Woodland habitat outside of redline.

GM1 – Marsh

Between the Avoca River and the arable fields is the Arklow Town Marsh pNHA. The area of marsh within the redline of the proposed development was dominated by Common-reed (*Phragmites australis*) with some herbaceous plants such as silverweed (*Potentilla anserina*), skullcap (*Scutellaria galericulata*), gipsywort (*Lycopus europaeus*), water-cress (*Nasturtium officinale (Rorippa nasturtium-aquaticum)*), marsh woundwort (*Stachys palustris*), purple loose-strife (*Lythrum salicaria*), field bindweed *(Convolvulus arvensis) wood anemone (Anemone nemorosa),* and nettle (*Urtica dioica*) growing in-between. Small scrubby patches of *Rhododendron sp.,* alder (*Alnus incana*) and willow (*Salix sp.*) were mosaiced across the landscape.

Plate 5.7: View of Arklow Town Marsh (looking west)

BL3 – Built land

Onsite, there were some roadways, farm buildings and a house which comprised the built land habitat. No flora or fauna of conservation importance were noted in this habitat.

Discussion of habitats

The subject site was mainly arable crop fields (BC1) and Tilled land (BC3) bordered by a mixture of hedgerows (WL1) and treelines (WL2). Some smaller habitats included a broadleaf woodland (WD5), scrub (WS1) and scattered trees and parkland (WD5). The most ecologically important habitats onsite are the Arklow Town Marsh (GM1) which has a pNHA status and the Avoca River (FW2).

Plant Species

The plant species encountered at the various locations on site are detailed above. No rare or plant species of conservation value were noted during the field assessment. Records of rare and threatened species from NBDC and NPWS were examined. No rare or threatened plant species were recorded within the proposed development site.

Invasive species

The marsh had some mature specimens of *Rhododendron sp.* and cherry laurel (*Laurocerasus officinalis*) was noted within the scrub habitat.

Bats

Bat surveys were carried out on site by Altemar from 2019- 2025. As outlined in Bat Fauna Impact Assessment (Appendix 5.3), the following bat species were noted on site:

- Soprano Pipistrelle (*Pipistrellus pygmaeus*)
- Common Pipistrelle (Pipistrellus pipistrellus sensu lato)
- Lesser Noctule (*Nyctalus leisleri*)
- Natterer's Bat (*Myotis nattereri*)
- Whiskered Bat (*Myotis mystacinus*)

It should be noted that Daubenton's Bat *(Myotis daubentonii)* was recorded during the bat surveys carried out by Brian Keeley along the Avoca River Estuary in 2016 and 2017. It was confirmed in 2020 that this species is roosting within Arklow Bridge, located approximately 265m downstream of the proposed development.

Fauna

Terrestrial Mammals

Camera traps were deployed on site from July to October 2024. Three sett entrances were noted in the woodland central/west of the survey area (Approximately 250m outside the redline). Two of these are almost certainly from the same sett, but it is possible based on the spoil heaps around these that tunnels may extend as far as the third burrow in the west of this woodland. One burrow in the woodland area in the southwest corner of the site was found and signs of recent badger activity in this area was noted (latrines, rooting, trails etc.). The cameras revealed the sett within the central woodland was being utilised by at least one badger regularly. The camera on the burrow in the southwest woodland recorded a pair of badgers and an individual regularly passing and investigating the burrow but not entering/exiting. It is likely these badgers are utilising the other sett identified on site and/or a sett in/adjacent to the site that has not yet been found. Also recorded occasionally entering the burrows during this period were Mink (*Mustela lutreola*), Fox's (*Vulpes vulpes*) and Rabbit (*Oryctolagus cuniculus*). Sika Deer (*Cervus nippon*) and rodents were also recorded. No hedgehog (*Erinaceus europaeus*) was noted onsite however the site outside the marsh would be considered of value to local populations.

It should be noted that Otter *(lutra lutra)* was recorded within the Avoca River Estuary by AQUAFACT in 2020. As outlined in the Biodiversity Chapter prepared by Arup submitted as part of the granted Flood Relief Scheme: *'Two individuals (1 adult 1 juvenile) were observed feeding along the southern bank in the early morning during the course of fieldwork carried out by AQUAFACT in summer of 2020'.* An otter footprint was noted on the northern bank of the Avoca in the 2025 surveys.

Figure 5.8: Badger dragging fresh bedding into sett entrance in centre-west woodland outside the site boundary.

Plate 5.8: Pair of badgers passing and investigating burrow in southwest woodland before moving on.

Plate 5.9: Mink observed in centre-west woodland of survey area to west of proposed site outline.

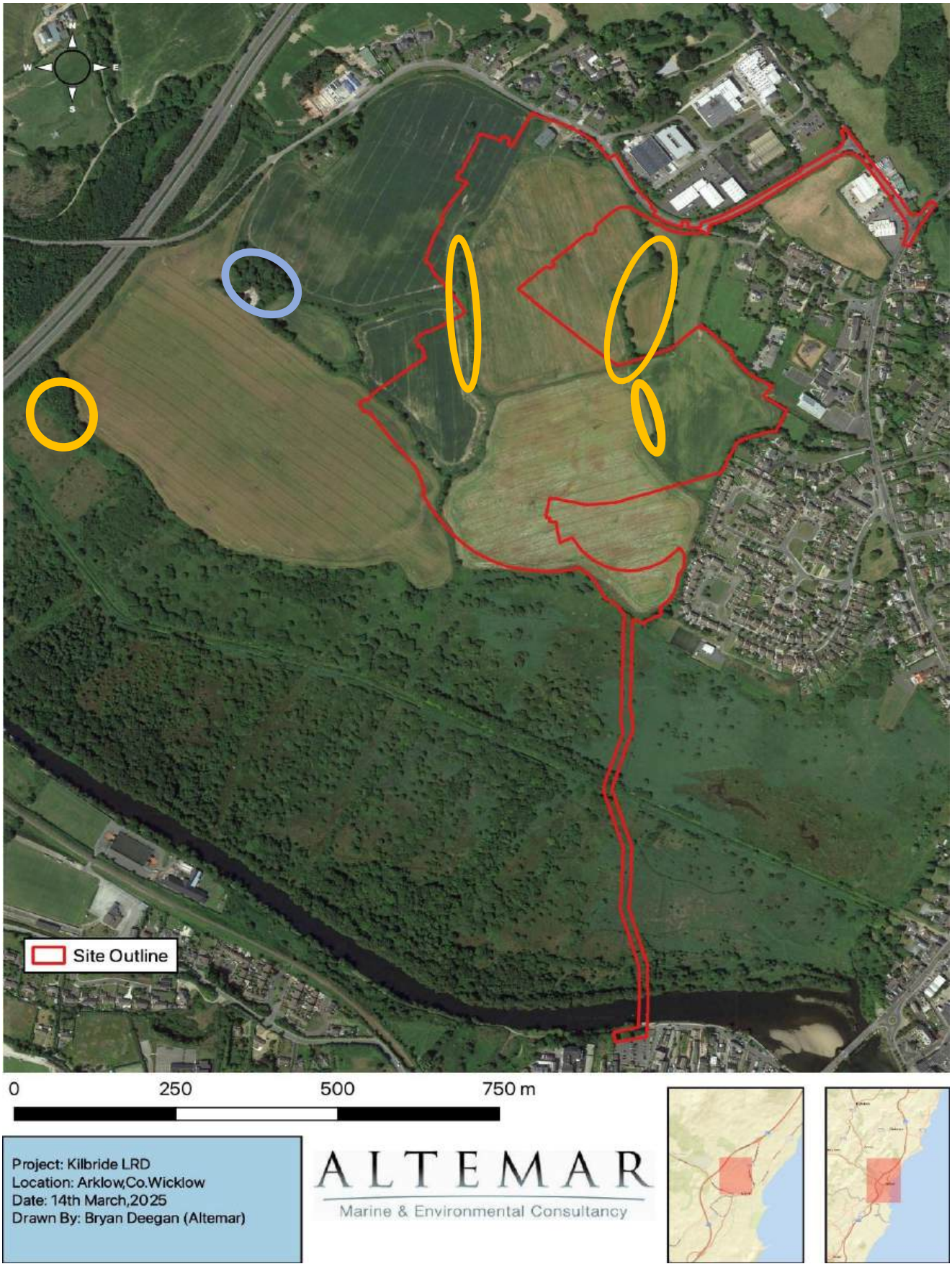


Figure 5.9: Map demonstrating the location of confirmed badger sett entrances onsite (blue ring) and badger activity onsite (i.e. rooting, latrines, prints, trails etc.) (orange rings).

Marine Mammals

As part of the Arklow WwTP project, marine mammal observation surveys were carried out in the Avoca River Estuary and in Arklow Bay to monitor marine mammals. As outlined in the Biodiversity Chapter prepared by Arup *'A total of 30 MMO watches, with a total duration of 268 hours of observations, was carried out during the 30 minutes prior to, and during site investigation works. During the watches no marine mammals were recorded.'*

Amphibians and Reptiles

An individual frog (*Rana temporaria*) was noted along the west boundary of the easternmost field of the site. Due to the wet nature of the site, particularly at its southern end, having a variety of drainage ditches and its proximity to the Avoca River, the Arklow Town marsh and the two small watercourses, the site would be of value to frog populations.

Breeding Birds

Three breeding bird surveys were carried out during the bird nesting season of 2024. Surveys were conducted by two surveyors on 29th May, 10th June and 24th June 2024, which encompassed areas both within and adjacent to the proposed site outline and general ownership boundary. Two breeding bird surveys were also carried out in 2025 by two surveyors on the 23rd April and 9th May 2025.

As outlined in Appendix 5.3: *'In 2024, 46 species of bird were recorded within, adjacent and over the survey area: 28 green listed, 14 amber, and four red-listed Birds of Conservation Concern in Ireland (BoCCI). Of these species, five were recorded breeding within the outline of the proposed development, all of which are green listed BoCCI (blackcap, hooded crow, whitethroat, woodpigeon & wren). No red-listed species were recorded breeding within the proposed site outline as well as the general area covered by surveys.*

In 2025, 29 bird species were recorded across the two surveys within, adjacent and over the survey area: 21 green listed and 8 amber listed Bird of Conservation Concern in Ireland (BoCCI). Of these species, one was recorded breeding within the outline of the proposed development. Additional species recorded breeding in habitats adjacent to the proposed site outline and/or within the general ownership/survey area are listed in Table 5. No red-listed species were recorded breeding within the proposed site outline as well as the general area covered by surveys.

Notably, in 2024, reed warblers (Acrocephalus scirpaceus) were recorded breeding at three locations within the Arklow Town Marsh pNHA, proximate to the proposed boardwalk development. As such, appropriate mitigation measures are necessary to minimise potential impacts on this species.'

Wintering Birds

Twelve wintering bird surveys were carried out on site across the 2024/2025 survey season. As outlined in Appendix 5.1, *'11 surveys by Emma Peters and 1 survey by Jack Doyle during the wintering bird season from October 2024 to March 2025. A total of 46 species were recorded within and above the survey areas across 12 surveys. 28 green, 14 amber and 4 red species of conservation concern were recorded either within, over or immediately adjacent to the survey area boundary. The red-listed red kite and meadow pipit were using the site and displaying foraging behaviour constantly throughout*

the surveys. The red-listed redwing(wintering) and grey wagtail although in small numbers, was observed using the site. The 14 other Amber-listed species were observed with in the survey area, in particular the Linnet displayed consistent foraging behaviour in the arable crop fields in flocks averaging 46.7 individuals.'

In addition, 12 wintering bird surveys were carried out on site by Hugh Delaney for the 2020/2021 season. As outlined in Appendix 5.2, '*56 bird species were recorded at lands at Kilbride in North Arklow during 12 winter bird surveys from October 2020 to March 2021. In the context of wintering bird species that are red listed as species of conservation concern in the revised Birdwatch Ireland List of birds of conservation concern in Ireland (2020-2026) Redwing and Snipe were recorded in small numbers. Results from the surveys suggest that the site is not an ex-situ foraging or roosting site for species of qualifying interest from nearby Special protection areas (SPA's).*

Some of the more notable species recorded on-site were Yellowhammer (wintering and likely breeding), Reed Bunting (wintering), Skylark (wintering), with occasional sightings of Red Kite and Kestrel on-site. Water Rail was recorded in the reed beds to the south of the site. At the Avoca River site in Arklow Town a number of amber listed wintering species were noted wintering, including four Gull species, Mallard, Teal, Cormorant and Mute Swan.'

Aquatic Biodiversity

Historically, fish surveys have been carried out in the Avoca River Estuary by The Central and Regional Fisheries Boards and Inland Fisheries Ireland. As outlined in Biodiversity Chapter prepared by Arup as mentioned above*, 'The Central and Regional Fisheries Boards carried out a fish stock survey of the Lower Avoca Estuary in 2008 (CFRB, 2009) and recorded the following 11 species of fish (with the number of specimens for each brackets): River lamprey (5), Whiting (2), 3 spined stickleback (5), Salmon,(1), Sea trout (2), Brown trout (1), 5 bearded rockling (6), Sand goby (1), Eel (20) Spratt (1), Flounder (225) and Mullet (36).*

Inland Fisheries Ireland (2012) carried out an electrofishing survey of a part of the upper Avoca River near Woodenbridge and recorded 6 juvenile salmon and eels at the site.

Inland Fisheries Ireland (2016) carried out a survey of River Lamprey between 2015 and 2016 in the upper reaches of the Avoca catchment in the Aughrim and Avonmore Rivers. A total of 8 lamprey were trapped over that time period. River lamprey spawning sites were recorded at 3 locations and spawning was first noted in March 31st and continued into mid-April.'

5.4 Characteristics of the Proposed Development

The purpose of this section is to provide an overview of the key relevant details of the construction phase and operational phase of the Proposed Development. The information presented in this section is informed by the project design, but it is not a complete description of the Proposed Development. Therefore, it should be read in conjunction with the full planning application. For a more comprehensive understanding of the Proposed Development, please refer to Chapter 2 (Description of the Proposed Development) of the EIA Report. Chapter 2 provides a detailed overview of the lifecycle of the project, including reference to the architectural and civil engineering, drawings, plans, reports, and other relevant document in order to define the Proposed Development.

In relation to the proposed development:
The proposed mixed use Large scale Residential Development will result in the demolition of an existing dwelling, outbuilding and agricultural shed and the construction of a local and 666 No. residential units with a mix of semidetached, detached, and terraced houses along with duplex apartments and apartments. These will comprise 1, 2, 3 and 4 bed houses. All residential units will have associated private open space facing north/ south/ east/ west. The proposal will also deliver 3 No. retail units, 3 No. community/ medical units and 1 No. creche unit.

New pedestrian/ cyclist link connecting into Arklow Town Centre is proposed via a new boardwalk and bridge across the marsh and over the Avoca River adjoining the existing greenway and the Main Street. A new road is also proposed connecting to the north to Kilbride Road. Alterations to the surrounding road network to provide a section of the regional road and upgrades to provide pedestrian facilities are also included. Vehicular access to the site will be from the new proposed regional road. The development will also provide for landscaping, public open spaces and all associated site development works to enable the development including boundary treatments, attenuation storage area and other service provision including ESB substation.

5.5 Potential Impacts

This section of the EIAR examines the potential causes of impact that could result in positive or negative effects arising on the species and habitats that occur within the ZOI of the proposed development. The following assessment of potential impacts is based on the EPA EIAR Guidelines 2022 (the EIAR Guidelines). These impacts could arise during either the construction or operational phases of the project. The following terms are derived from the EPA EIAR Guidelines and are used to describe the likely significant effects on the ecological receptors arising from the construction and operation of the proposed development.

Magnitude of effect (change)		Typical description
High	Adverse	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements.
	Beneficial	Large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality.
Medium	Adverse	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements
	Beneficial	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Low	Adverse	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.
	Beneficial	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial effect on attribute or a reduced risk of negative effect occurring
Negligible	Adverse	Very minor loss or alteration to one or more characteristics, features or elements.
	Beneficial	Very minor benefit to or positive addition of one or more characteristics, features or elements.

Table 5.6: Magnitude of effect and typical descriptions

Importance	Ecological Valuation

International	Sites, habitats or species protected under international legislation e.g. Habitats and Species Directive. These include, amongst others: SACs, SPAs, Ramsar sites, Biosphere Reserves, including sites proposed for designation, plus undesignated sites that support populations of internationally important species.
National	Sites, habitats or species protected under national legislation e.g. Wildlife Act 1976 and amendments. Sites include designated and proposed NHAs, Statutory Nature Reserves, National Parks, plus areas supporting resident or regularly occurring populations of species of national importance (e.g. 1% national population) protected under the Wildlife Acts, and rare (Red Data List) species.
Regional	Sites, habitats or species which may have regional importance, but which are not protected under legislation (although Local Plans may specifically identify them) e.g. viable areas or populations of Regional Biodiversity Action Plan habitats or species.
Local/County	Areas supporting resident or regularly occurring populations of protected and red data listed-species of county importance (e.g. 1% of county population), Areas containing Annex I habitats not of international/national importance, County important populations of species or habitats identified in county plans, Areas of special amenity or subject to tree protection constraints.
Local	Areas supporting resident or regularly occurring populations of protected and red data listed-species of local importance (e.g. 1% of local population), Undesignated sites or features which enhance or enrich the local area, sites containing viable area or populations of local Biodiversity Plan habitats or species, local Red Data List species etc.
Site	Very low importance and rarity. Ecological feature of no significant value beyond the site boundary

Table 5.7: Criteria for Establishing Receptor Sensitivity/Importance

Quality of Effects	Effect Description
Negative /Adverse Effect	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Neutral Effect	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Positive Effect	A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).

Table 5.8: Quality of Effects

Significance of Effect	Description of Potential Effect
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.

Table 5.9: Significance of Effects

Duration and Frequency of Effect	Description

Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting less than a year
Short-term	Effects lasting one to seven years.
Medium-term	Effects lasting seven to fifteen years.
Long-term	Effects lasting fifteen to sixty years.
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration

Table 5.10: Duration and Frequency of Effects

Describing the Probability of Effects	Description
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

Table 5.11: Describing the Probability of Effects

Construction Phase

In the absence of mitigation, the overall development of the site is likely to have direct negative impacts upon the existing habitats, fauna and flora. Direct negative effects will be manifested in terms of the removal of the site's internal habitats. The removal of these habitats will result in a loss of species of low biodiversity importance. These construction effects however would include effects that may arise during the site clearance, re-profiling of the site and the building phases of the Proposed Development which include works within the Avoca River Estuary and the Arklow Town Marsh pNHA. It should be noted that Altemar has been involved in the project from initial concept design and has provides significant input into the design of the project to limit potential effects on biodiversity and within the Arklow Marsh pNHA. Potential impacts are assessed below for each of the ecological components:

Designated Conservation sites

In the absence of mitigation, the overall development of the site is likely to have direct negative impacts upon the existing habitats, fauna and flora. Direct negative effects within the main housing element will be manifested in terms of the removal of the site's internal habitats. The removal of these habitats will result in a loss of species of low biodiversity importance. These construction effects however would include effects that may arise during the site clearance, re-profiling of the site and the building phases of the Proposed Development. Works within the Avoca River (small element of bridge landing) and the Arklow Town Marsh pNHA (boardwalk). The design and proposed construction methodology of the boardwalk has taken into account the sensitivities of the pNHA including the hydrological regime, biodiversity and to minimise medium to long term impacts. Construction phase mitigation measures are required on site particularly as significant reprofiling of the housing element of the site is proposed which can lead to dust and silt laden and contaminated runoff. Runoff during site works re-profiling and the construction of project elements could effect on the Arklow Town Marsh and the Avoca River.

In relation to Natura 2000 sites (SAC & SPA), given the minimum distance (4.1 km) and the flocculation and estuarine circulation patterns that occur within the estuary any pollutants, silt laden run off or dust that enters the surface water network will be dispersed or diluted to negligible levels prior to reaching any European sites. Measures are outlined to comply with Water Pollution Acts. These are

standard construction measures and are not deemed necessary for the protection of Natura 2000 sites. In the absence of these measures silt would settle within the tributary of the Avoca River and in the event of a pollution incident dilution, flocculation and mixing would occur within the river catchment and estuarine element of the Avoca River prior to reaching the nearest Natura 2000 sites.

The AA Screening concludes *''Surface water which enters Arklow Town Marsh via the Avoca River tributary, will enter the adjacent Avoca Estuary and ultimately the marine environment. Flocculation and estuarine circulation patterns will occur within the Avoca Estuary. It should be noted that a 25m Riparian Buffer will be implemented from the adjacent watercourse along the eastern boundary of the subject site. In the absence of mitigation, pollutants, silt laden run off or dust which enter the surface water network will be dispersed or diluted within the estuary and the marine environment, to negligible levels, prior to reaching any European sites. Foul wastewater will be directed to the Arklow Wastewater Treatment Plant (WWTP). The treated effluent from the new Arklow WwTP will discharge to the Irish Sea. There will, therefore, be an indirect pathway from the proposed development site to European sites within the Irish Sea (Specifically: Buckroney Brittas Dunes and Fen SAC, Kilpatrick Sandhills SAC, Magherabeg Dunes SAC).*

Having taken into consideration foul and surface water drainage from the proposed development, the distance between the proposed development to designated conservation sites, lack of direct hydrological pathway or biodiversity corridor link to conservation sites, and the dilution effect with other effluent and surface runoff, it is concluded that the proposed development would not give rise to any significant effects to designated sites. The construction and operation of the proposed development will not impact on the conservation objectives of qualifying interests of European sites.''

Given the fact that construction works are proposed within Arklow Town Marsh pNHA, there is a risk of pollutants, silt laden run off and dust, entering the pNHA in the absence of mitigation measures.

In addition, there is a risk of physical disturbance from construction machinery and materials to the marsh biodiversity along the route of the boardwalk during the construction phase of the development. During construction of the boardwalk, temporary timber bog mats will be laid over the marshland to accommodate construction traffic. This approach minimises long term impacts on the marshland vegetation and specifically, the reedbeds which are naturally resilient habitats that are tolerant to moderate physical disturbance. The use of end-driven steel pile foundations will ensure no soil arisings are generated, eliminating the need for off-site disposal and minimizing ecological disturbance of the pNHA. The steelwork deck will be installed in prefabricated sections and lifted in position onto the support steels which will ensure construction remains as limited as possible within the marsh.

In the absence of mitigation, lighting during the boardwalk construction phase of the development has the potential to impact upon the existing ecology such as birds and bats located within the pNHA and in particular, species proximate to the proposed boardwalk location. Lighting will only be used during construction working hours and not directed towards bat foraging areas. In addition, the project ecologist will be consulted in relation to lighting during construction within the marsh.

Effects: Low Adverse / International / Negative Effect / Not significant / short term. Mitigation is required in relation to the pNHA but not for Natura 2000 sites.

Biodiversity

The impact of the proposed development during construction phase will be a loss of existing habitats and species within the housing development site. It would be expected that the flora and fauna associated with these habitats would also be displaced. However, the eastern boundary hedgerow will

be retained. There is the potential for contaminated surface water runoff and pollution to enter the surface water drainage network within the Arklow Town Marsh prior to being discharged to the Avoca River. However, due to the significant distance, mixing and dilution by other rivers this is not expected to have any significant impacts of designated sites downstream. In the absence of mitigation there is potential for localised impacts on aquatic biodiversity.

Terrestrial mammalian species

No protected terrestrial mammals were noted within the proposed housing development site. Evidence of badger (*Meles meles*) transiting through the site was noted. An active badger sett was recorded 250m to the west of the site. Loss of habitat and habitat fragmentation may affect some common mammalian species. Otter are noted on the Avoca river, but on holts were noted in the vicinity of the proposed works. Sika deer are noted on site including within the marsh. Lighting and noise in the vicinity of the Avoca River during construction has the potential to disturb otter movements.

Potential Impacts in the absence of mitigation: Low adverse / site / Negative Impact / Not significant / short term. Mitigation is needed in the form of a pre-construction survey for terrestrial mammals of conservation importance and control of lighting and noise on site, particularly proximate to the Avoca River.

Flora

The plants noted onsite are listed above in their various habitats. No plant species of conservational concern were noted onsite. No Third Schedule invasive species (Article 49 & 50 of the Habitats Directive 2011) were noted on site. Rhododendron sp. and cherry laurel *(Laurocerasus officinalis)* were noted onsite. It is highly recommended to remove and dispose of these species to prevent further spreading. Site clearance will removal of flora species on site that are not of conservation importance.

Potential Impacts in the absence of mitigation: Low adverse / site / Negative Impact / Not Significant / Short term.

Bat Fauna

As outlined in Appendix 5.4, *Foraging activity was relatively low across the site and no bats were observed to be roosting or emerging onsite during the 2025 surveys however, in the 2024 surveys, three bat roosts were noted within the property ownership line. These are demonstrated in figure 18. There were several trees of roosting potential along the boundary, as well as the treelines in the centre of the site, as can be seen in Figure 18. The proposed development will alter the local environment as new structures are to be erected and the existing buildings to be removed. In the absence of mitigation measures, these changes would impact any potential bat roosting habitats that may develop in the future and impact the existing ones. The removal of vegetation on site will reduce bat foraging habitat. Lighting during construction and operation has the potential to impact on foraging of bats on site in the absence of mitigation. Mitigation measures will be required to limit light spill to protect bat foraging areas including within the marsh.'* It should be noted that within the marsh habitat there is very limited roosting potential for bats. As an enhancement measure it is proposed to install 12 bat boxes within the superstructure of the boardwalk above the highest flood levels and 6 bat boxes within the parks on site.

Potential Impacts in the absence of mitigation: Low adverse / Local / Negative Impact / Not significant / long term. Mitigation is needed in the form of pre-construction site surveys.

Bird Fauna

Due to the potential presence of breeding birds on site the construction will result in a loss of foraging and nesting habitat for breeding habitat for breeding birds. Hedgerows along the eastern site boundary are to be retained. Reed warbler and sedge warbler are both green listed and breeding within the marsh habitat along the proposed route of the boardwalk. It should be noted that within the marsh habitat there is very limited nesting potential for birds except for the riparian corridor and along the old stone road within the marsh. As an enhancement measure it is proposed to install 10 bird boxes within the superstructure of the boardwalk above the highest flood levels and 40 bird boxes within the housing development on site.

Potential Impacts in the absence of mitigation: Low adverse / Local / Negative Impact / Not significant / medium term. Mitigation is needed in the form of control of site clearance outside bird nesting season, the laying of bog matting to ensure no impact on nesting birds, and the provision of compensatory nesting habitat.

Aquatic Ecology

A small tributary of the Avoca River is located along the eastern boundary of the proposed development site. In addition there are two channels proximate to the stone road within the pNHA which transport surface water to the Avoca River. Standard mitigation measures will be implemented to ensure runoff during site clearance, re-profiling, the construction and operation of project elements could impact on the Avoca River and surface water network, with water quality within these watercourses with potential downstream impacts aquatic ecology within this watercourse network.

The Avoca River Estuary is located to the south of the site where the proposed boardwalk will cross over however, the majority of the boardwalk across the Avoca River will be installed on top of the previously granted flood defence scheme structure. In total, 12 no. additional piles be installed into the Avoca River to support a section of the boardwalk along the southern bank of the river, however this will be done in conjunction with the construction of the Arklow Flood Defence Scheme, which will utilize the construction access routes and riverbed preparation provided by the granted scheme.[1]
The contamination of watercourses and surfaces water networks could potentially impact negatively on the biodiversity within the watercourses and within the shallow marine environment.
Impacts in the absence of mitigation: negative; slight, short term, not significant. Mitigation is required.

Operational Phase

Once constructed all onsite drainage will be connected to separate foul and surface water systems. Surface water runoff will comply with SUDS. Rainwater from the boardwalk will flow directly off the decking into the marsh area. The biodiversity value of the site would be expected to improve as the landscaping matures.

[1] 310368 | An Bord Pleanála

Designated Conservation sites within 15km

During operation, surface water run off from the development will enter Arklow Town Marsh via the Avoca River tributary, which will outfall to the adjacent Avoca Estuary and ultimately the marine environment. Flocculation and estuarine circulation patterns will occur within the Avoca Estuary. It should be noted that a 5m Riparian Buffer will be implemented from the adjacent watercourse along the eastern boundary of the subject site. In the absence of mitigation, pollutants, silt laden run off or dust which enter the surface water network will be dispersed or diluted within the estuary and the marine environment, to negligible levels, prior to reaching any European sites.

Foul wastewater will be directed to the Arklow Wastewater Treatment Plant (WWTP) which officially opened in May 2025. Foul wastewater drainage will ultimately be treated along this public network. The treated effluent from the new Arklow WwTP will discharge to the Irish Sea. There will, therefore, be an indirect pathway from the proposed development site to European sites within the Irish Sea (Specifically: Buckroney Brittas Dunes and Fen SAC, Kilpatrick Sandhills SAC, Magherabeg Dunes SAC).

Arklow Town Marsh pNHA is a sensitive receptor located within the site boundary. A boardwalk is proposed to traverse from north to south through the pNHA that will connect the site to Arklow Town located across the Avoca River. Lighting is proposed in the boardwalk.

Petrochemical runoff from the site could potentially negatively directly or indirectly impact the aquatic ecology within the marsh. However, runoff from the housing development will have to comply with standard County Council drainage requirements and will require petrochemical interception which will be attenuated and discharged at greenfield rates to the surface water network.

In relation to lighting proposed within the pNHA, handrail lighting will be installed along the boardwalk which has the potential to impact on bat foraging in the marsh in the absence of mitigation. Consultation took place between Altemar and the lighting specialists to minimise the potential of light spill into the surrounding marsh.

In the absence of mitigation, the proposed development would be seen to have a negative, minor adverse, long term, not significant, international and likely effect on designated sites during operation.

Habitats, Botany and Avian Ecology

During the operational phase of the development there will be an increase in disturbance including noise and light that could potentially impact on birds on site. As the landscaping elements improve with maturity it would be expected that the biodiversity value of the site to birds and flora would also increase. This would result in an increase in biodiversity in the long term. Light spill on site will increase from the current baseline which would have a negative effect on biodiversity. Landscape, light spill and habitat management will be important to overall impact of the operational phase.

Aquatic Ecology

Petrochemical runoff from the site could potentially negatively directly or indirectly impact the aquatic ecology. Runoff from the development and roads will have to comply with County Council drainage requirements and will require petrochemical interception and which will be attenuated and discharged at greenfield rates to the surface water network. The drainage connections and the installations in relation to petrochemical interception should be inspected by the project ecologist.

In the absence of mitigation, the proposed development would be seen to have a negative, minor adverse, long term, not significant, local and likely effect on aquatic ecology during operation. *Standard mitigation is required in relation to petrochemical interception.*

Protected Terrestrial Mammals

No active badger setts were noted on site. Evidence that badgers are transiting through the site was noted (trails, latrines, snuffle holes). An active badger sett was confirmed via camera traps 250m to the west of the site, outside the site boundary. Lighting and increased human presence/disturbance may impact badgers on site and reduce their foraging areas.

Impacts in the absence of mitigation: negative; slight, site, long term, not significant. *Mitigation is required in relation to lighting proximate to the Avoca River.*

Amphibians and Reptiles

An individual frog (*Rana temporaria*) was noted along the west boundary of the easternmost field of the site. Due to the wet nature of the site, particularly at its southern end, having a variety of drainage ditches and its proximity to the Avoca River, the Arklow Town marsh and the two small watercourses, the site would be of value to frog populations. Standard water pollution mitigation is in place in the design of the drainage strategy.

Impacts in the absence of mitigation: negative; slight; long term, not significant. *Mitigation is required. A pre-construction survey for amphibians will be carried out.*

Avian Ecology

There is potential for avian biodiversity to be impacted by the artificial lighting on site. The proposed lighting strategy has been discussed and modified to reduce the potential impact on biodiversity. This has included only lighting areas where required and not lighting public open spaces unless necessary. In addition, the landscape strategy has included significant planting of native trees in open space areas to encourage birds on site. Enhancement measures are proposed.

Impacts in the absence of mitigation: negative; minor adverse, site, long term, not significant. Mitigation is required.

Bat fauna

There is potential for bat foraging to be impacted by the artificial lighting on site. The proposed lighting strategy has been discussed and modified to reduce the potential impact of the development on bats. This has included only lighting areas where required and not lighting public open spaces unless necessary. In addition, warm lighting (2200K) will be used along the boardwalk route. The landscape strategy has included significant planting of trees in open space areas to encourage bat foraging on site.

Impacts in the absence of mitigation: slight negative, site, long term, not significant. *Mitigation is required including consultation with the project ecologist in relation to lighting and the development of an initial prototype to minimise light spill from the boardwalk. This would include the optimal angle of the lighting within the rail and mesh design to limit side spill.*

5.6 Potential Cumulative Impacts

There are several proposed developments located in the area immediately surrounding the subject site. The following is a list of planning applications in close proximity to the subject site as identified on the Department of Housing, Local Government and Heritage's 'National Planning Application Database' portal[2],:list of planning applications in close proximity to the subject site as identified on the Department of Housing, Local Government and Heritage's 'National Planning Application Database' portal[3],:

Ref. No.	Address	Proposal
2484	Upper Main Street , Arklow , Co. Wicklow	demolition of existing derelict buildings (1292 sqm); construction of 99 residential units comprising 59 no. apartments with four blocks, ranging in height from 4 to 7 storeys (7 no. 1 bed units, 42 no. 2 bed units and 10 no. 3 bed units) and 40 no. 3 storey houses (20 no. 4 bed units); construction of a 350 sqm mixed use building of four storeys containing 350 sqm of retail space at ground floor and residential units above; refurbishment, extension and change of use from a derelict two storey house to a 146.3 sqm creche; refurbishment of the former Ormonde Cinema (Record of Protected Structure Ref. A39) for commercial use comprising 322.5 sqm office at first floor and 32 sqm office, 181 sqm lounge/café and 59 sqm café uses at ground floor; relocation of a Victorian letterbox (Record of Protected Structure Ref. A40) within the scheme; provision of public open space including a new amphitheatre, a new plaza, communal and private open space; provision of internal access roads with vehicular, pedestrian and cyclist access and new vehicular access onto Upper Main Street; 169 no. car parking spaces and 196 no. bicycle parking spaces provided at basement and surface level; realignment of Coomie Lane to create a new pedestrian links between Vale Road, Upper Main Street and the River Avoca walkway; all associated and ancillary site development works above and below ground, including signage, 2 no. ESB substations, alteration to existing landscape features, play area, sculpture, retaining walls, clearance works, landscaping, excavation, bin stores, boundary treatments and services provision
22433	townlands of Killiniskyduff, Tiknock, Kilbride, and Shelton Abbey	the installation of underground electrical infrastructure between the existing Arklow Gas-insulated Switchgear (GIS) 220kV Substation and the permitted Pollahoney GIS Substation. This will include the installation of approximately two underground electricity cable circuits, each at 3.12km in length and associated underground ducting, horizontal directional drilling, joint bays, communication cabling infrastructure between the existing Arklow GIS 220kV Substation and the permitted Pollahoney GIS substation, (WCC reg ref 20/1285). All associate and ancillary site development, remedial and construction works will be concentrated along the public road network, i.e. R772, L2180, L6179-0 and L-61791-0 to facilitate the underground cabling infrastructure within the townlands of Killinskyduff, Tiknock, Kilbride and Shelton Abbey.
23843	Site at Avoca River Park , Arklow , Co. Wicklow	proposed development. The proposed development includes an amendment to the development permitted under Reg. Ref. 21/1080, The proposed development will consist of the following to facilitate the above. Demolition of the existing structures on the western part of the site that comprises 4 no. industrial commercial buildings, an associated hut / outbuilding, a gas enclosure, and a tank with bund wall. The

2 https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=9cf2a09799d74d8e9316a3d3a4d3a8de

3 https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=9cf2a09799d74d8e9316a3d3a4d3a8de

Ref. No.	Address	Proposal
		removal of the remains of a previously demolished building, areas of hard standing, and existing surface treatments. The relocation of the Energy Centre 1 to the western part of the site, which will supersede the previously permitted 110kV GIS substation compound at that location under ABP Ref: VA27.309252. The proposed development will provide for a revised energy centre design, to include the provision of 8 no. gas turbines (with associated flues of 25.15m in height), 4 no. black start emergency generators and associated transformers, 2 no. single storey fuel oil pump rooms with a gross floor area (GFA) of 90.17sq.m, a single storey air compressor building with a GFA of 88.9sq.m, 4 no. fuel tanks, 2 no. MCC control rooms with a GFA of 44.17sq.m, 3 no. fire water tanks, a single storey welfare, storage, and pump room building with a combined GFA of 160.97 sq.m, a two storey MV /LV building with a GFA of 655.54sq.m, 8 no. 11kV/ 33kV step-up transformers in the north of the site, water treatment equipment, and a security hut, all within a fenced compound. The proposed development includes landscaping and planting, boundary treatments, lighting, security fencing, car parking, and all site works including underground foul and storm water drainage network (including on-site wastewater treatment system), and utility cables, along with all associated and ancillary works. An EPA- Industrial Emissions Directive (IED) licence will be applied for to facilitate the operation of the proposed development
23756	Lands at Kilbride , Arklow , Co.Wicklow	86 no. residential units with a mix of detached, semi-detached, terraced houses and duplex apartments ranging in height from 2 to 3 storeys; comprising of 8 no. 1-bed and 8 no. 2-bed duplex apartments, 10 no. 2-bed houses and 60 no. 3-bed houses; all residential units will have associated private open spaces facing north/south/east/west; alterations to Kilbride Road (L6179) to provide a section of the new road into the wider Kilbride Masterplan lands with vehicular, pedestrian and cycle access provided; a new dedicated pedestrian and cyclist access will also be provided to the south-east of the development connecting via the Marshland's sports club lands, and through Avondale Crescent to the Dublin Road; landscaping, public open spaces and all associated site development works to enable the development including boundary treatments, attenuation storage area and other service provision
22213	Kilbride Educational Campus, Kilbride, Arklow, Co. Wicklow	construction of a new educational campus and a new link road that will servce the school campus which will include the provision of two school buildings. Gaelscoil an Imbhir Mhóir a two-storey, 16 classrooms primary school with two special needs rooms and ancillary spaces with total floor of circa 3093sqm serving 480 pupils. Gaelshólaiste na Mara a three-storey, post primary school with two special needs rooms, PE hall and ancillary spaces with a total floor area of circa 6585sqm serving 400 pupils. Proposed site works to include the construction of all new hard play areas, six play-courts, grass pitch, 182 no. car-parking spaces together with boundary treatment, 79 bicycle stands, ancillary infrastructure works, pedestrian links and landscaping.
20383	Kilbride Cottage, Kilbride Road, Arklow, Co. Wicklow	154 sqm rear and side dormer style extension to 48 sqm dwelling, front dormer window to roof, proposed front porch, replacement wastewater treatment system to EPA standards in lieu of existing septic tank and associated works
18326	Glenhaven Foods (Arklow) Ltd, Kilbride Industrial Estate, Arklow, Co. Wicklow	amendments to a previously approved planning permission for the subject site - Planning Permission Reference Number 16A/446. The amendments will comprise of modifications to the planning approved layouts and elevations, the associated changes include recladding of existing building elevations, the relocation of storage tanks, extended and reconfigured plant room layouts, extended and reconfigured storage areas, incorporating a total increased to the building size of 416 sqm (from 1891 sqm to 2307 sqm) with a revised ridge height not exceeding 10.2m
ABP 302556-18	Arklow, Co.Wicklow	Arklow Wastewater Treatment Plant Project. Application made directly to An Bord Pleanala under Strategic Infrastructure provision.

Ref. No.	Address	Proposal
ABP-310368-21	Arklow Co. Wicklow	Arklow Flood Relief Scheme • Works at Arklow Bridge, a protected structure (RPS A26), including the underpinning of the piers and southern abutment, removal of existing concrete scour slab and lowering the floor of Arklow Bridge by approximately 1m, construction of new concrete scour slab and remedial works to bridge masonry; • River dredging works to improve channel capacity, comprising dredging of the river channel from approximately 320m upstream of Arklow Bridge to approximately 520m downstream of Arklow Bridge, including removal of in river sandbanks and vegetated islands north of Arklow Bridge and trimming of vegetation along the north bank between the debris trap and Arklow Bridge that lies within the river channel and below the design flood level. Occasional future maintenance as required of the river channel by dredging, estimated to be at 10-year intervals; • Extension into the river channel by circa 12m along an approximate 75m length of the northern river bank upstream of Arklow Bridge; • Installation of 3 no roosting platforms for birds upstream of Arklow Bridge; • Construction of debris and gravel traps and a permanent river access ramp on the south bank for their maintenance; Annual maintenance of the debris trap and gravel trap using a temporary in-river haul road. • Flood defences on the south bank of the Avoca River including: o Demolition of existing walls and river access and provision of approximately 325m of flood defence concrete finish wall founded on sheet piles and concrete foundations, with intermittent glass panels, upstream of Arklow Bridge on River Walk from just west of St Mary's (Main Street) car park; o Demolition of some existing walls and river access, provision of approximately 655m of flood defence concrete finish wall founded on sheet piles and concrete foundations, with a glass panel at the former Tyrells yard slipway, and modifications to approximately 20m of existing wall downstream of Arklow Bridge, on South Quay and on the western and southern sides of the Dock in the Arklow Harbour area); o Construction of stormwater drainage system including 3no. pumping stations along the south bank and adjoining streets; and o At the Dock, in the Harbour area, installation of demountable flood barriers at two locations to allow access to the shipyard and the public slipway, which will normally be maintained in a closed position. • Flood Defences on the north bank of the Avoca River including approximately 545m flood defence earthen embankment with adjoining maintenance track in Arklow Town Marsh close to its eastern boundary and approximately 60m sheet-piled wall with concrete cap to be constructed upstream of Arklow Bridge's north western abutment, and realignment and reforming/reinforcing both banks of the existing channel where it enters the Avoca River to the west of the Avoca Bridge. Permanent access road from Dublin Road to maintenance track. • Removal of existing public realm at River Walk and South Quay, including demolition of the river access at the junction of River Lane and River Walk, and a disused slipway (referred to as Coal Quay) on South Quay, existing footpaths, street and decorative lighting, parking spaces and seating. • Provision of new public realm at River Walk and South Quay, including parking spaces, footpaths, amenity/viewing area, public lighting, planters and floating pontoon. Provision of additional urban space approximately 6m into the river on South Quay immediately south of the Arklow Bridge for a length of approximately 260m and provision of additional urban space extending between approximately 0m and 6m into the river on River Walk for a length of approximately 100m. • The proposed works include road reconstruction, road regrading, traffic calming measures, provision of a section of interconnector sewer for the Arklow Wastewater Treatment Plant (WwTP) for Irish Water, diversion of utilities, including electricity cables in Arklow Marsh, tree felling, tree trimming, tree planting, landscaping, local

Ref. No.	Address	Proposal
		riverbed raising, installation of roosting platforms upstream of Arklow Bridge and all associated and ancillary works. • Temporary works including establishing six site compounds: northeast edge of Arklow Town Marsh, on lands between the running track and Mill Road, on land between the river and the roundabout located at the junction of Arklow Bridge, Ferrybank and North Quay, on part of St Marys (Main Street) car park, on lands between the eastern end of North Quay and North Pier, and on lands between Arklow Golf Club and South Beach. River access will take place at North Quay, South Quay, River Walk and north-west of Arklow Bridge. These site compounds will operate over the duration of the works and will facilitate the construction of the scheme and archaeological examination and stockpiling of excavated and dredged material.

Based on a review of the planning application viewer there are no developments of significance proposed in proximity of the proposed development. It is important to note that as outlined in the Infrastructure Design Report that accompanies this EIAR in relation to the Greenway Boardwalk across marsh and Avoca River "*The phasing of this will be dependent on the delivery of the debris trap columns and the riverside public realm works as part of the Arklow Flood Relief Scheme. Following consultation with WCC on the programme, these works are currently scheduled to complete in Q3/Q4 2028. It is therefore expected that this infrastructure can only be delivered in Q1/Q2 2028*."

Given this, it is considered that in combination effects with other existing and proposed developments in proximity to the application area would be unlikely, neutral, not significant and localised. It is concluded that no significant effects on European sites will be seen as a result of the proposed development alone or combination with other projects.

5.7 Mitigation Measures

Mitigation measures will be incorporated into the proposed development project to minimise the potential negative impacts on biodiversity within the ZOI. Mitigation measures are outlined within the Land, Soil and Geology (Chapter 6), Air and Climate (Chapter 9) and Noise & Vibration (Chapter 8) of the EIAR. In addition to these mitigation measures mentioned elsewhere in the EIAR specific mitigation in relation to biodiversity need to be implemented having taken into account the measures outlined elsewhere in the EIAR.

Construction Phase

In addition to mitigation measures outlined elsewhere in the EIAR, the following measures will be implemented to protect biodiversity:

- A pre-construction survey for bats and terrestrial mammals will be carried out. This will include an inspection for resting and breeding places for both terrestrial mammals and bats. Should resting or breeding places be found a derogation licence will be acquired from NPWS and conditions followed prior to works commencing in the vicinity of the resting or breeding place.
- An Ecological Clerk of Works (ECoW) will be appointed to oversee the construction phase and to oversee the implementation of all mitigation including compliance with Wildlife Acts and Water Pollution Acts and ensure that biodiversity in neighbouring areas including birds will not be impacted.

- Relevant guidelines and legislation (Section 40 of the Wildlife Acts, 1976 to 2012) in relation to the removal of trees and timing of nesting birds will be followed e.g. do not remove trees or shrubs during the nesting season (1st March to 31st August). If removal is required during this season the removal of woody material will be carried out under the supervision of an ecologist. If nesting birds are present NPWS will be contacted, and removal will be subject to conditions outlined by NPWS. A pre-construction survey for reed warbler and sedge warbler will be carried out along the proposed boardwalk route if carried out within bird nesting season.
- Lighting during construction will be carried out in consultation with the project ecologist and treelines or wooded areas will not be lit. Consultation with the project ecologist will be carried out in relation to lighting and the development of an initial prototype to minimise light spill from the boardwalk. This would include the optimal angle of the lighting within the rail and mesh design to limit side spill.
- It would be expected that the beneficial effects of these trees would not be seen until the medium to long term.
- Removal of deciduous trees. Should any mature broadleaved tree be scheduled for removal as part of the development plans, it will first be surveyed for roosting potential and bat presence if required. If bats are found, an application for a derogation licence should be made to the National Parks and Wildlife Service to allow its legal removal. Such trees will be felled in the period late August to late October, or early November, in order to avoid disturbance of any roosting bats as per National Roads Authority guidelines (NRA 2006a and 2006b) and also to avoid the bird breeding seasons. Any tree felling will be completed by mid-November at the latest as bats roosting in trees are very vulnerable to disturbance during their hibernation period (November – April). Trees may be removed at other times but the likelihood of encountering bats during works will be higher. Trees with ivy-cover, once felled, will be left intact onsite for 24 hours prior to disposal to allow any bats beneath foliage to escape overnight.
- Trees to be retained. Where possible, treelines and mature trees that are located immediately adjacent to planned construction areas or are not directly impacted will be avoided and retained intact. Retained trees will be protected from root damage by machinery by an exclusion zone of at least 5 metres or equivalent to canopy height. Such protected trees will be fenced off by adequate temporary fencing prior to other works commencing.
- Lighting restrictions. In general, artificial light creates a barrier to bats so lighting will be avoided where possible. Where lighting is required, directional lighting (i.e. lighting which only shines on work areas and not nearby countryside) will be used to prevent overspill during construction. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvers and shields to direct the light to the intended area only.
- Lighting will be centred on the boardwalk to minimise light spill on either side into the marsh.
- 50 bird boxes and 18 bat boxes will be placed on site as an enhancement measure. Of these ten bird boxes and 12will be placed on the board walk. The position of these boxes will be carried out in consultation with an ecologist.
- Pre-construction survey for breeding reed warbler *(Acrocephalus scirpaceus)* will be carried out along the proposed boardwalk route if bog matting is to be placed during bird nesting season.

Operational Phase

The biodiversity value of the site would be expected to improve as the landscaping matures. The proposed development has a sustainable drainage strategy and detailed landscape strategy and mitigation during operation will be carried out as outlined elsewhere in the EIAR. The following operation mitigation measures will be carried out:

1. Post construction an inspection of drainage connections to the watercourse network will be carried out by the project ecologist.
2. Post construction monitoring and surveys for bats in the marsh and along the Avoca River Estuary will be carried out.
3. A post construction prototype light spill assessment and bat activity assessment will be carried out along the boardwalk.

5.8 Predicted Impacts

Construction Phase

Based on the successful implementation of the construction phase controls and the works to be carried out in accordance with this EIAR, it is likely that there will be no significant ecological impact arising from construction works proposed for the proposed project. Natura 2000 sites will not be impacted by the proposed development during construction.

A series of standard construction phase control measures have been outlined to ensure that the proposed project does not impact on species or habitats of conservation importance, conservation areas or watercourses during construction. It is essential that these measures are complied with to ensure that the proposed works do not have downstream environmental impacts. These measures are to protect the Arklow Town Marsh pNHA, Avoca River and a tributary of the Avoca River along the southeastern boundary of the site, which are potentially the primary vector of impacts from the site, are not impacted during construction and operational phases of the proposed development.

No significant environmental impacts are likely in relation to the construction of the proposed development. Effects: moderate effects / National / Negative effect / Not significant /short term/likely. Standard mitigation will be in place on site.

Operational Phase

Based on the successful implementation of the operational phase controls and the works to be carried out in accordance with this EIAR and the accompanying AA Screening, it is likely that there will be no significant ecological impact arising from operation of the proposed project. Designated conservation sites will not be impacted by the proposed development.

Standard operational phase control measures have been outlined to ensure that the proposed project does not impact on species or habitats of conservation importance, conservation areas or watercourses. It is essential that these measures are complied with, to ensure that the proposed works do not have downstream environmental impacts. These measures are to protect the Arklow Town Marsh and Avoca River, which are potentially the primary vector of impacts from the site, is not impacted during operational phases of the proposed development. Light spill will be introduced into the area but these have been designed to have minimal impact on biodiversity. It would be expected that there would be no significant long term impact on the reedbed based on the mitigation and it

would be expected that the reed bed in the vicinity of the bog matting would recover within 3 years. The operation of the boardwalk would not have a long term impact on the Arklow Marsh pNHA.

No significant environmental impacts are likely in relation to the operation of the proposed development.

Effects: Slight effects / site / Negative effect / Not significant / long term/likely. Standard mitigation will be in place on site.

5.9 'Do Nothing' Scenario

Due to the zoning of the subject site, it would be expected that in the absence of this subject proposal a development of similar scale and nature would be progressed. Under this scenario, in the absence of specific development details, it is likely that the effect would be similar to this proposal as outlined below. However, in the absence of any development on the site it would be expected that the site would continue to be farmed.

5.10 Monitoring & Reinstatement

Construction Phase

A project ecologist will be appointed to oversee construction works on site. Pre-construction surveys will be carried out for terrestrial mammals, birds and bats.

Operational Phase

Post construction bat monitoring and surveys will be carried out in the marsh and along the Avoca River Estuary.

5.11 Difficulties in Compiling Information

No difficulties were encountered in the preparation of the Biodiversity Chapter of this EIAR.

5.12 References

Department of Environment Heritage and Local Government Circular NPW 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities March 2010.

Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities, Department of the Environment, Heritage and Local Government 2009;
http://www.npws.ie/publications/archive/NPWS_2009_AA_Guidance.pdf

Managing NATURA 2000 Sites: the provisions of Article 6 of the Habitats Directive 92/43/EEC, European Commission 2000;
http://ec.europa.eu/environment/nature/Natura2000/management/docs/art6/provision_of_art6_en.pdf

Assessment of Plans and Projects Significantly Affecting NATURA 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC;
http://ec.europa.eu/environment/nature/Natura2000management/docs/art6/Natura_2000_assess_en.pdf

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
https://ec.europa.eu/environment/nature/natura2000/management/pdf/methodological-guidance_2021-10/EN.pdf

Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission;
http://ec.europa.eu/environment/nature/Natura2000/management/docs/art6/guidance_art6_4_en.pdf

Guidance document on the implementation of the birds and habitats directive in estuaries and coastal zones with particular attention to port development and dredging;
http://ec.europa.eu/environment/nature/Natura2000/management/docs/guidance_doc.pdf

The Status of EU Protected Habitats and Species in Ireland.
http://www.npws.ie/publications/euconservationstatus/NPWS_2007_Conservation_Status_Report.pdf

6. Land, Soil & Geology

6.1 Introduction

This chapter of the EIAR describes the likely significant effects of the Project in relation to soils, geology and hydrogeology. This chapter provides a description of the Project in the context of soils, geology and hydrogeology, the baseline soils, geology and hydrogeology environments for the Project site and a statement of the likely significant impacts associated with both the construction and operation phases of the development. In addition, a 'do nothing' scenario has also been considered. Mitigation measures are proposed in the form of avoidance, prevention, reduction, offsetting, and reinstatement or remedial measures and recommendations for monitoring are included where appropriate predicted residual effects are described.

This chapter has been prepared by Donnachadh of Donnachadh O'Brien & Associates Consulting Engineers. Donnachadh is a Chartered Engineer and a Fellow of the Association of Consulting Engineers of Ireland with over 30 years' experience as a Consulting Civil & Structural Engineer. Donnachadh has extensive experience in the design and delivery of residential development schemes and has advised clients including government bodies, local authorities and private developers. Relevant projects include the Blackpitts Mixed Use Development, Dublin 8, Oldtown Woods, Celbridge, Co. Kildare and Southgreen Road Residential Development, Dunmurray, Co. Kildare

6.2 Methodology

- This chapter has been prepared having regard to the following guidelines;
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018)
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017)
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports – (EPA, 2022)
- Guidelines on the Information to be contained in Environmental Impact Assessment Reports DRAFT (EPA, August 2017);
- Advice Notes for preparing Environmental Impact Statements DRAFT (EPA, September 2015);
- Guidelines on Information to be contained in Environmental Impact Statements (EPA, 2002);
- Advice Notes on Current Practice in the preparation of Environmental Impact Statements (EPA, 2003);
- Guidelines for the preparation of Soils Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013);
- Geology in Environmental Impact Statements, A Guide (IGI, 2002);
- Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA 2009);
- Control of Water Pollution from Construction Sites (CIRIA, 2001); and Environmental Handbook for Building and Civil Engineering Projects (CIRIA, 2000).
- The assessment followed a phased approach as outlined in Chapter 4.4 of the Advice Note (EPA, 2015) and the IGI Guidelines (IGI 2013).

Initial Assessment

An initial assessment was carried out which defined the Project in terms of location, type and scale, established the baseline conditions; established the type of soil/ geological environment; established the activities associated with the Project and; initial assessment and impact determination. These objectives were achieved by way of a geological desk study and baseline data collection. A full list of sources for the desk study together with relevant legislation are included in Section 6.3 and are briefly listed below:

- Ordnance Survey of Ireland maps;
- Geological Survey of Ireland Groundwater and Geotechnical map viewer;
- Environmental Protection Agency Envision Maps; and
- National Monuments Service maps.

Additional information has been compiled through consultation and feedback from the project/EIAR Team. The information obtained from the above listed sources were utilised to establish the baseline conditions for the site.

Geotechnical and Environmental Investigations

The second phase of the assessment includes the results from a geotechnical investigation which was commissioned by the Applicant and was undertaken in 2019 by IGSL (Report No.: 22153). The site conditions have not changed since the commissioning of this GI and the results are considered to continue to represent the existing conditions. Ground investigations consisted of a combination of: -

- Trial Pits
- Cable percussion (shell and auger) exploratory boreholes
- Plate Bearing Testing
- Soakaway Testing (to BRE365)
- Groundwater Monitoring
- Gas Monitoring
- Laboratory testing
- Standpipe water level readings

The geotechnical investigation was carried out in accordance with Eurocode 7 – Part 2: Ground Investigation & Testing (EN 1997-2:2007). This has been used together with complementary documents such as Engineers Ireland Specification for Ground Investigation (2nd Ed, 2016), BS 5930 (2015+A1:2020) and BS 1377 (Parts 1 to 9) and the following European Norms:

- EN 1997-2 Eurocode 7: 2007- Geotechnical Design – Part 2: Ground Investigation & Testing
- EN ISO 22475-1:2006 Geotechnical Investigation and Sampling – Sampling Methods & Groundwater Measurements
- EN ISO 14688-2:2017 Geotechnical Investigation and Testing – Identification and Classification of Soil, Part 1: Identification and Description
- EN ISO 14688-2:2017 Geotechnical Investigation and Testing – Identification and Classification of Soil, Part 2: Principles for a classification

- EN ISO 14689-1:2017 Geotechnical Investigation and Testing – Identification, description & classification of rock

The boreholes were carried out in December 2019 while the standpipe water level readings were obtained in January 2020.

The second phase also includes a Detailed Assessment and Impact Determination which was carried out and incorporates the full range of site investigations and studies and a full assessment of any potential impacts. The approach adopted is as per the IGI Guidelines (IGI, 2013) and each potential effect of the Project has been described in terms of Quality, Significance, Extent, Probability and Duration in Table 6.1 below refers to the potential impacts assessed. The classification of impacts/effects in this chapter follows the definitions provided in the Guidelines (EPA, 2017). Where the Initial Impact Determination concluded that the level of potential impact is capable of measurable and noticeable consequences it is carried into the next assessment phase.

The Site Investigation Report is provided in Appendix 6.1.

Table 6.1: Potential Impacts

Activity	Construction Element	Potential Impact Description
Earthworks	Pond/ Attenuation Excavation Pond/ Attenuation Construction Foundation Excavation Boardwalk Construction	Excavation of natural soils and subsoil for roads, foundations, ponds, swales, drainage, etc.
		Airbourne dust arising from soil stockpiles causing nuisance dust on public roads and neighbouring properties.
		Imported fill material shall be required as part of works.
		Excavation of top soil material.
		Excavation of subsoils can serve to reduce the local groundwater levels as the water table naturally lowers to a new equilibrium below the artificial ground level.
		Seepage of underlying groundwater.
		Discharge of contaminated groundwater to adjacent watercourse.
Groundwater Abstraction		Groundwater abstraction associated with temporary dewatering forcing changes in pore water pressures and potential settlement and/ or subsidence in downstream unconsolidated sediments.
Groundwater Flow Paths		Groundwater flow paths may be potentially altered due to the construction of sub-surface structures. Groundwater mounding can theoretically occur where large impermeable structures are placed perpendicular to groundwater flow paths.
Groundwater Quality		Potentially contaminated water generated within the excavation could impact the southern marsh.

Proposed Mitigation Measures

The third phase identifies mitigation measures to address the identified impacts. The development, including all identified mitigation measures (assumed implemented), is then subject to impact assessment, to identify any residual impacts. The Final Impact Assessment presented in Table 6.3 incorporates the outputs from the Detailed Assessment and Impact Determination, Mitigation Measures and Residual Impact Assessment.

The final phase of work was the completion of this chapter and associated figures and appendices which has followed the EPA Guidance Note and Design Team Template.

6.3 Receiving Environment

Overview

This section describes the receiving environments for land use and soils, to establish the factors which may be directly affected by the Project.

Existing Land Use and Topography

The site is located in the area of Kilbride on the northern side of the Avoca River in Arklow, Co. Wicklow. The site is bounded by open fields to the west and to the north by the Kilbride Industrial estate and Kilbride Road L-6179. The site slopes in a broadly north / south direction to the town marsh and Avoca River. The Pyramid of Arklow; national monument, and its associated graveyard are located to the north west of the ownership area but outside of the subject site. The site is also adjacent to the KWETB proposed school site (Planning Ref. 22/213), which has received planning permission by Wicklow County Council. The site is also adjacent to a recently granted 84 units scheme which was submitted by the same client as this application relates to (ABP Ref. ABP-319604-24 & Wicklow Co. Co. Ref. 23/756) as outlined in Figure 6.1

This submission consists of the initial phase of a large residential development, to be provided over the coming years. The overall proposed masterplan seeks to provide c.1500 residential units, creches, local centre, the first phase of a future regional road for Arklow town, new roads connecting the site to the surrounding areas and a pedestrian / cycle path.

Figure 6.1: Existing Site

The site topography in level varies between +37.800m AOD and +1.500 AOD, and slopes from North to South. The existing Site topography is indicated below in Figure 6.2.

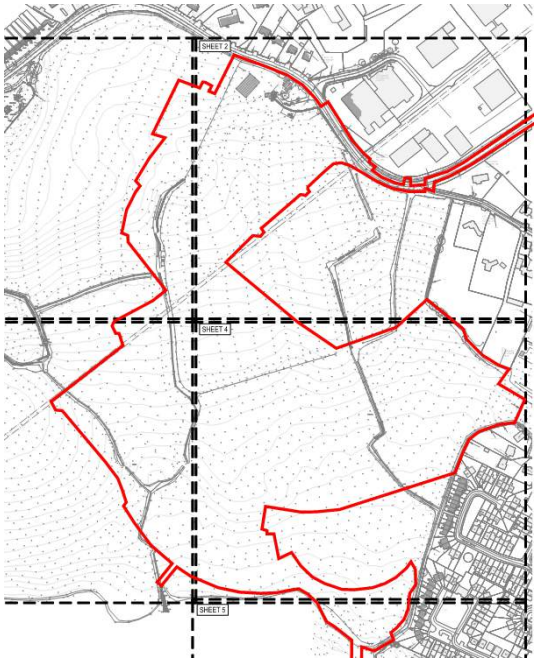


Figure 6.2: Existing Site Topography

History and Land Use

A number of historical maps for the scheme location were obtained from Ordnance Survey Ireland (OSI).

- OSI 6-inch mapping series, 1829- 1842,
- OSI 6-inch Cassini series, 1830-1930 and
- OSI 25-inch mapping series, 1888- 1913.

Figure 6.3: OSI 6-inch Mapping Series 1829- 1842

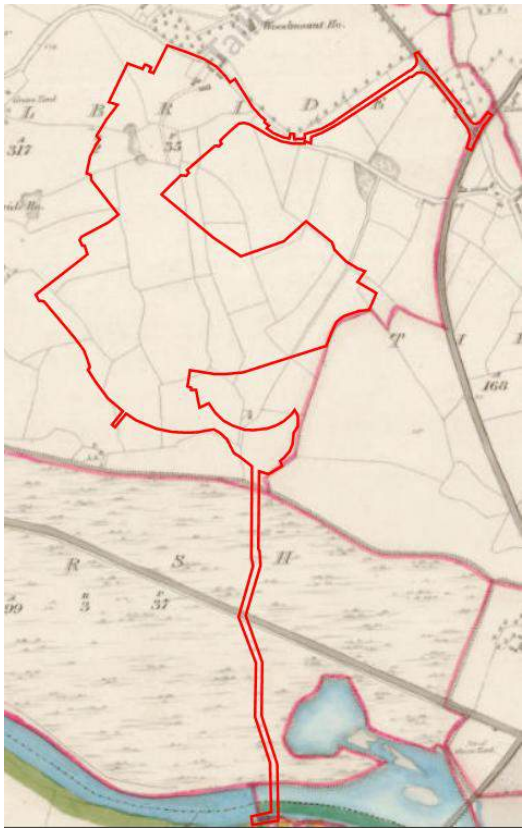


Figure 6.4: OSI 6-inch Cassini Series 1830-1930

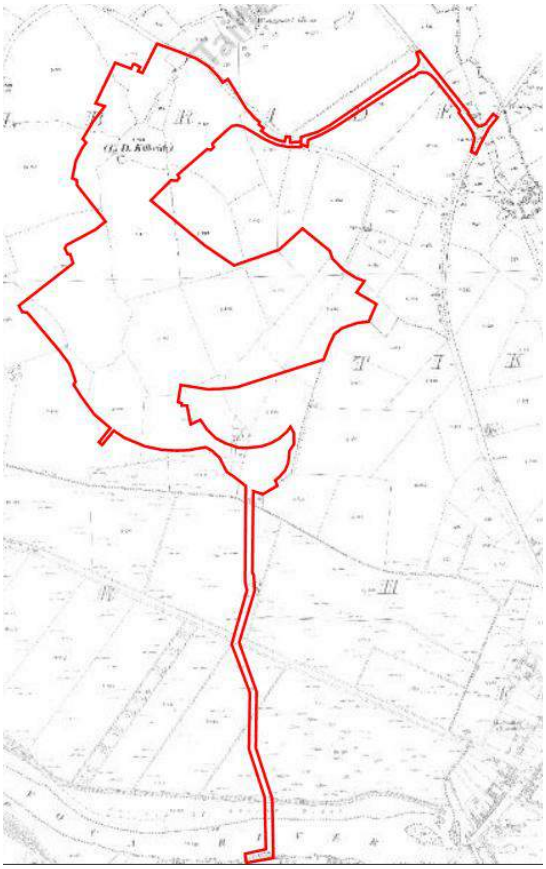


Figure 6.5: OSI 25-inch Mapping Series 1888-1913

Overall, the area appears as undeveloped land in all of the maps. It is important to note that there is an unnamed watercourse running parallel along the Southern boundary of the site in the Avoca Marshland in all three figures above.

Aerial Photography

Aerial Photographs of the site area were obtained from OSI records.

- A colour aerial photograph from 2013

Figure 6.6: OSI Aerial Photograph of Site- 2013

Comparing the obtained aerial image to the current site, there have been no major developments within the site.

Geology

Quaternary Deposits

GSI Quaternary maps indicate that superficial drift deposits consist predominantly of Till In the portion of the site that contains the residential element to the development derived from Cambrian sandstones and shales (IrSTLPSsS) as indicated in Figure 6.7. The Marshland of which the proposed boardwalk runs through predominantly consists of Alluvium soils as also indicated in Figure 6.7. The surrounding superficial deposits within 1km proximity of the site further include till derived from Lower Palaeozoic sandstones and shales, Alluvium and Irish Sea Till derived from Lower Palaeozoic sandstones and shales.

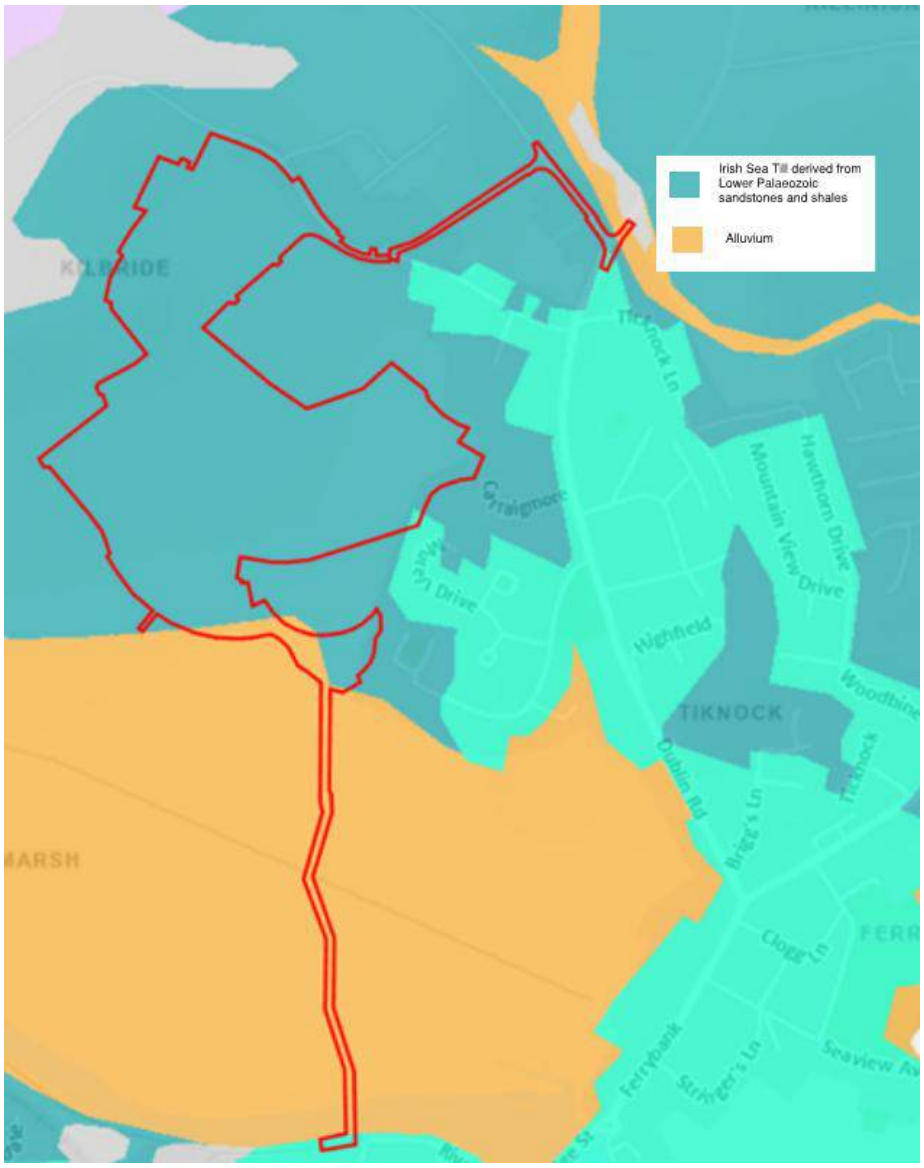


Figure 6.7: Extract from GSI Quaternary Mapping 1

Bedrock

Reference to the GSI map for the area in Figure 6.8 indicates that the site is underlain by deep marine; Slate, shale, minor sandstone & siltstone from the Palaeozoic, Middle - Upper Ordovician age bracket. No outcrops were found on site during IGSL's site investigation.

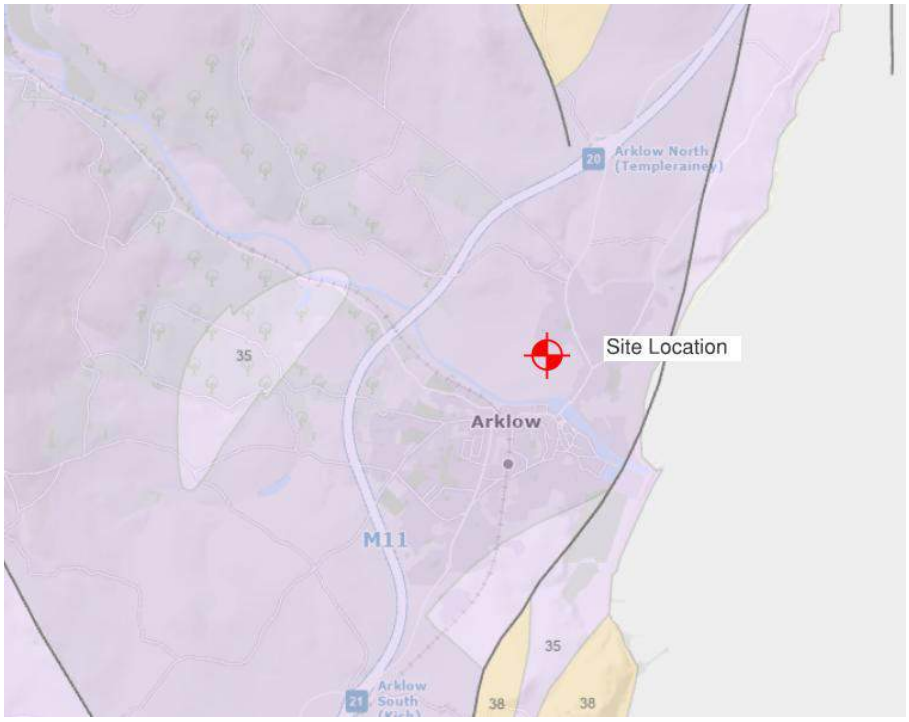


Figure 6.8: Extract from GSI Bedrock Mapping

Fluvial Flooding

Mapping published as part of the OPW Avoca River Flood Relief Scheme is used to evaluate the fluvial flood risk to the proposed development. From a review of this mapping and predicted flood water levels, it can be seen, the majority of the proposed site is located within Flood Zone C and not at risk from fluvial flooding. Minimal portions of greenway link, for which the link is raised above with a freeboard of 500mm to the Flood level, open space/ landscaped areas are identified in Zone A and B.

The proposed greenway and associated embankments located within the flood zone have been calculated to displace approximately 1825m3 of flood volume during the 1:1000 year event. It is proposed to provide compensatory storage in the southern greenspace to account for any displaced volume lost to the greenway embankments. An area of approximately 1046m2 has been identified as being suitable to regrade the ground 1.35m lower than existing to allow for lost flood volume to be catered for as described in the Site Specific Flood risk Assessment (SSFRA). These areas have been identified as being located in Flood Zone C, as such, suitable for the provision of compensatory storage.

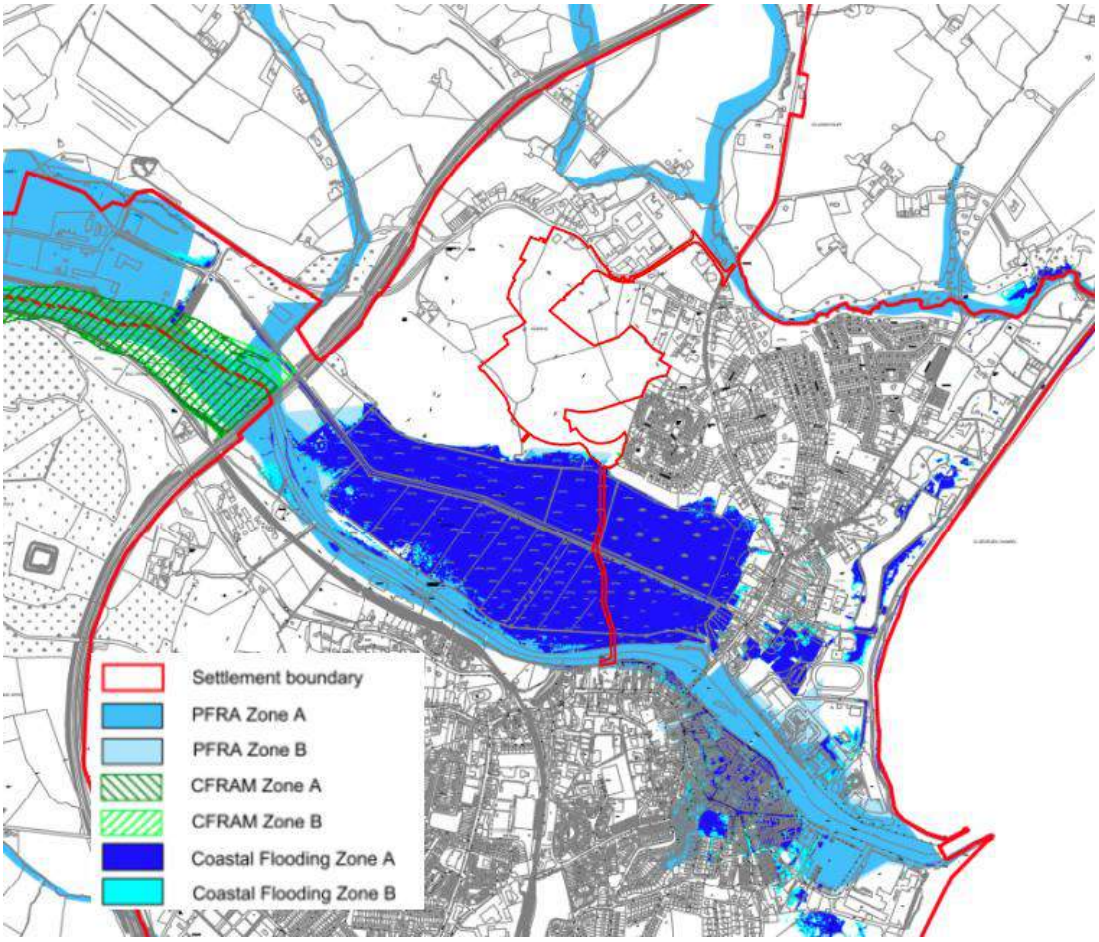


Figure 6.9: Map C1- Arklow & Environs LAP

Subsoil Permeability

The Groundwater Subsoil Permeability map classifies how easy water can infiltrate subsoils downwards at any point in the land surface. Permeability across the country is classified as either 'High', 'Moderate' or 'Low'. Figure 6.10 identifies the residential area of the site as directly overlying low permeability deposits. The Marsh area to the south of the site of which the boardwalk greenway runs through has been identified as moderate permeability as far as the Avoca River to the south.

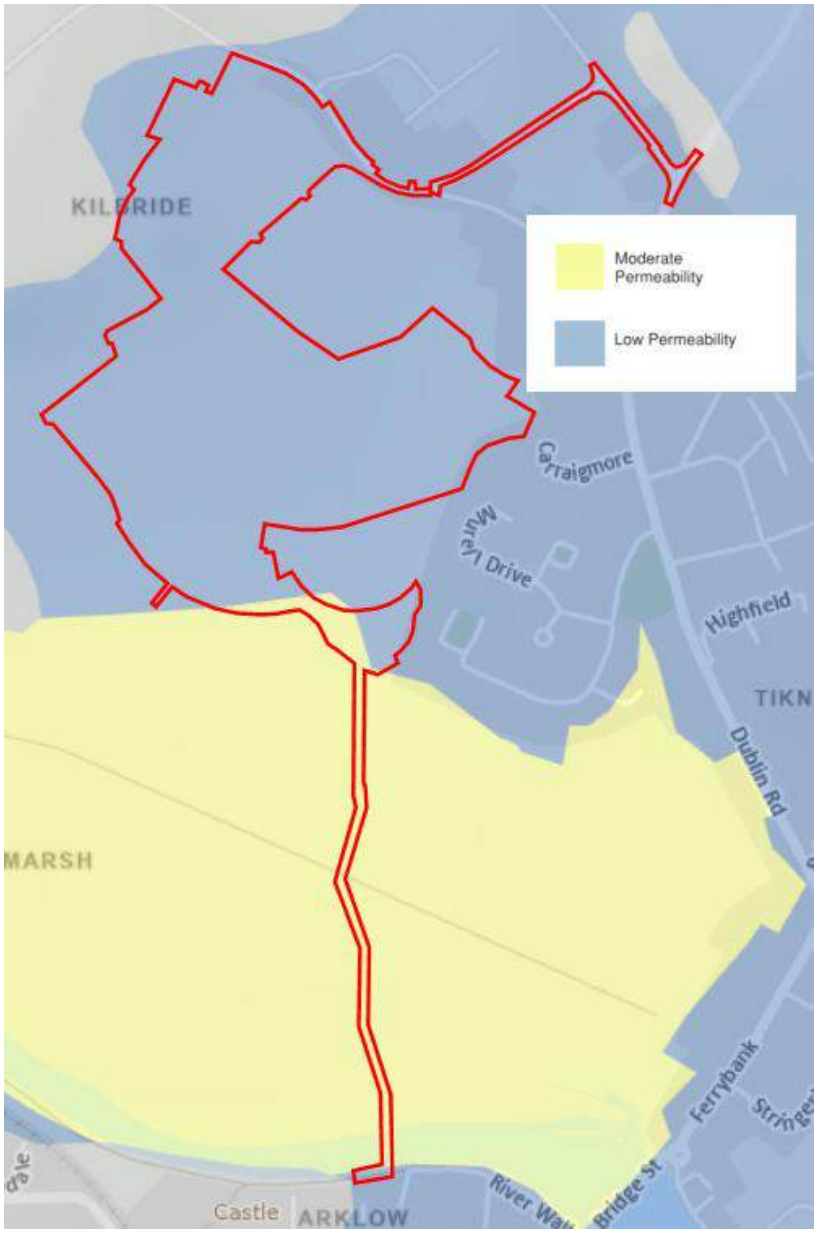


Figure 6.10: Extract from GSI Subsoil Permeability Mapping

Groundwater Vulnerability

The residential area of the site is predominantly located in an area of moderate groundwater vulnerability as indicated as shown in Figure below which is an extract from the Geological Survey of Ireland (GSI) groundwater map viewer. There are areas of low and high vulnerability towards the west and north west. The area to the south of the site containing the Avoca Marsh as indicated in Figure 6.11 consists of low vulnerability groundwater.

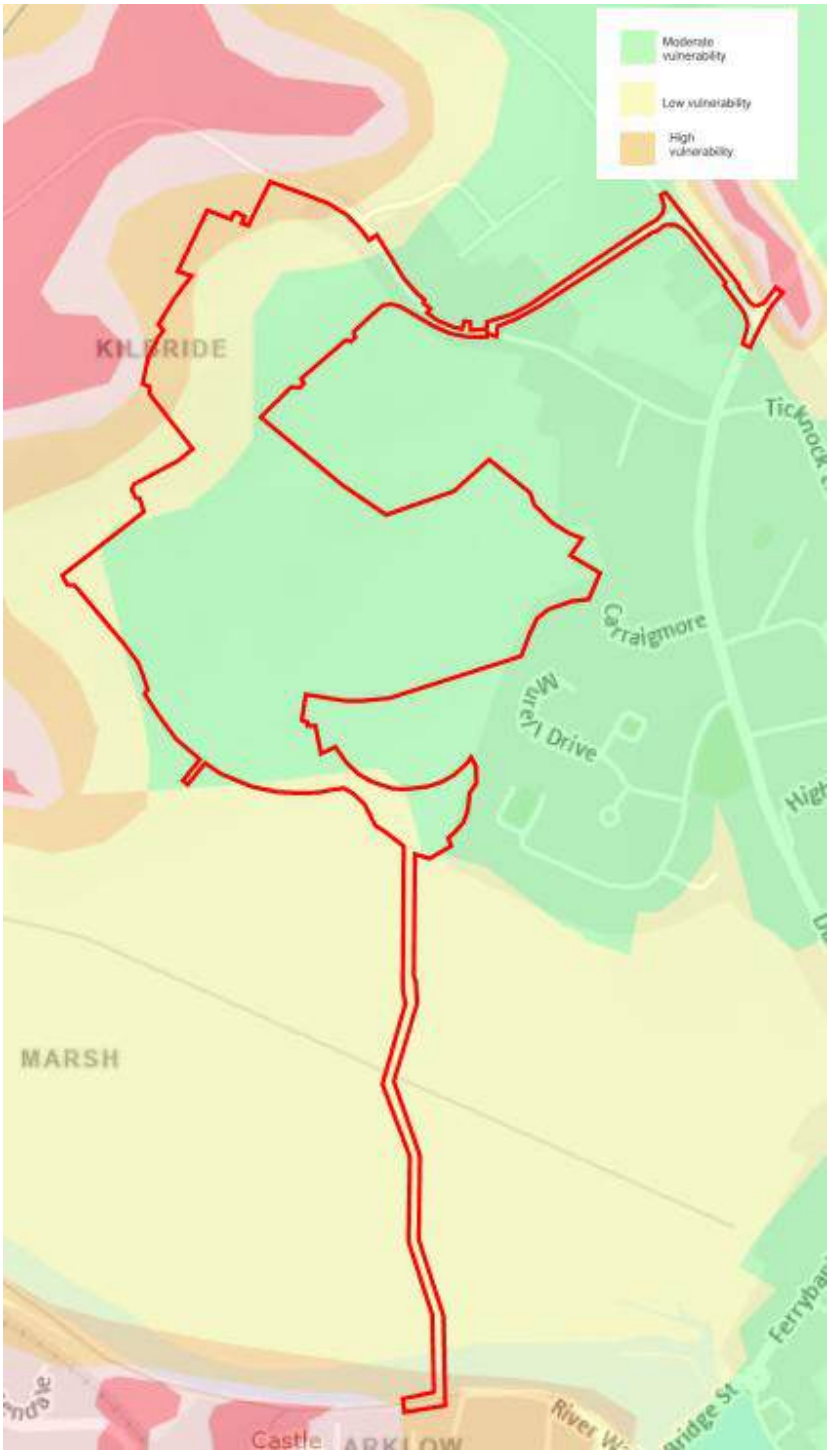


Figure 6.11: Extract from GSI Groundwater Vulnerability Mapping

Groundwater Recharge

The GSI groundwater recharge map provides an estimate of the average amount of rainwater that percolates down through the subsoils to the water table over a year. It is a function of the subsoil permeability, groundwater vulnerability and bedrock aquifer type. The majority of the site is located within areas of moderate groundwater recharge. With the north western corner be considered to also be moderate, but with wet soils.

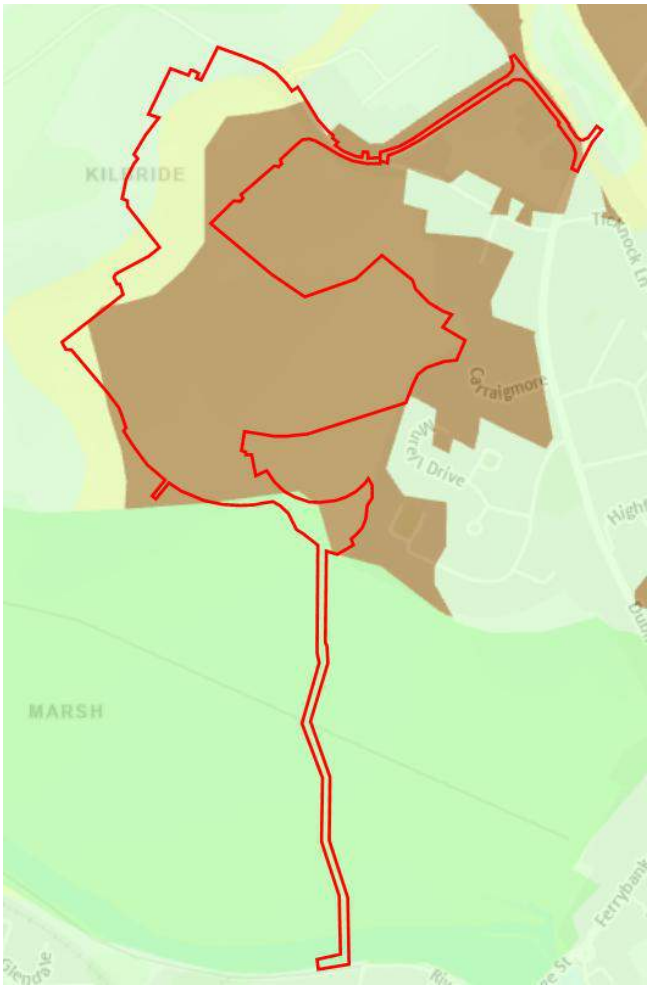


Figure 6.12: Extract from GSI Groundwater Recharge Mapping

6.4 Characteristics of the Proposed Development

Description of Site

The proposed mixed use large scale Residential Development will result in the demolition of an existing dwelling and 2 no. sheds/outbuildings and the construction of 666 no. residential units with a mix of semidetached and terraced houses along with duplex apartments and apartments. These will comprise 1, 2, 3 and 4 bed units. All residential units will have associated private open space facing north/ south/ east/ west. The proposal will also deliver a local centre containing 3 no. retail units, 3 no. community/ medical units and 1 no. creche unit.

A new pedestrian/ cyclist link is provided via a new boardwalk and bridge across the marsh and over the Avoca River adjoining the existing greenway and the Main Street. A new road providing vehicular access is also proposed connecting to the north to Kilbride Road along with road improvements in the surrounding area.

The development will also provide for landscaping, public open spaces and all associated site development works to enable the development including boundary treatments, attenuation storage area and other service provision including ESB works.

Difficulties Encountered

No difficulties were encountered during the preparation of this chapter of the EIAR.

Consultation

The applicant engaged with Wicklow County Council regarding the proposed development during the following stages of the LRD Process

- S247 meeting on 15th May 2024
- Section 32B meeting on 18th December 2024;
- LRD Opinion 21st January2025

As a result of the engagement with Wicklow County Council, the following criteria has been considered as part of the development proposal: -

- Low permeability soils do not permit the discharge of surface water direct to ground using infiltration techniques and Soil Type 4 may be used in the calculation of Q_{bar} for the site
- Surface water is to be attenuated underground site to facilitate a 1:100 Year plus 20% Climate Change event
- Attenuated surface water shall discharge to an existing watercourse, where eventually flows shall be conveyed to the Arklow Marsh area which is as a natural flood plain and also a proposed Natural Heritage Area (pNHA).
- Surface water run-off shall be attenuated in above ground retention basins where feasible with supplementary underground tanks and restricted using a flow control device
- Petrol interceptors shall be used to treat surface water prior to discharging to the watercourse
- Permeable paving shall be provided to the car parking bays with linear filter drains
- Tree pits/ bio retention areas shall be used where possible to treat surface water and to provide additional surface water storage minimising the extent of underground attenuation required.

In addition, consultation has taken place with Uisce Eireann (UE) through meetings, a Pre-Connection Enquiry, UE issued a Confirmation of Feasibility letter which confirmed that a connection from the Project to the existing wastewater and water supply networks can be facilitated subject to upgrades. Uisce Eireann have provided a statement of design acceptance in respect to the proposed wastewater layout and design.

6.5 Potential Impacts

Construction Phase

Below is a summary of the likely potential impacts throughout the Construction Phase:

- Excavated and stripped soil can be disturbed and eroded by site vehicles during the construction phase. Rainfall and wind can also impact on non-vegetated/uncovered areas within the excavation or where soil is stockpiled. This can lead to run-off with high suspended solid content which can impact on water bodies. The potential risk from this indirect impact to water bodies and/or habitats from contaminated water would depend on the magnitude and duration of any water quality impact.
- There is a potential for dust from demolition works, excavations or stockpiles to impact on air quality. This is discussed further in Chapter 9 ‘Air Quality and Climate’.

- Construction phase dewatering will likely be required to excavate the foundations/ pond structures and to maintain dry working conditions in the excavation due to rainfall and potential groundwater ingress as the excavation progresses with depth. Pumped surface water shall require treatment as part of the surface water strategy during construction as discussed further in Chapter 12 Material Assets: Built Services.
- Noise and vibration will be generated through the construction phase particularly during excavation work. This is discussed further in Chapter 8 'Noise and Vibration'
- The construction phase which includes the importing or exporting of material to the site (as part of excavation or infilling works) will have implications for traffic in the surrounding road network. These impacts are considered further in Chapter 12 relating to Material Assets Traffic and Transport.
- There is potential for surface water and/or groundwater to become contaminated with pollutants associated with construction activity. Contaminated water arising construction sites may pose a significant short-term risk to groundwater quality for the duration of the construction should it be permitted percolate to the aquifer. The potential sources of contaminants include the following: -
    - Contaminated groundwater within the site from previous site activities,
    - Suspended solids arising from excavation and ground disturbance,
    - Hydrocarbons arising from accidental spillages from construction plant or onsite storage,
    - Cement/concrete arising from construction materials,
    - Wastewater arising from poor on-site toilet and washrooms.

Table 6.2: Summary of Likely Significant Effects during Construction before Mitigation

Activity	Construction Element	Potential Impact Description	Quality	Significance	Extents	Probability	Duration	Type
Earthworks	Pond/ Attenuation Excavation Pond/ Attenuation Construction	Excavation of natural soils and subsoil for roads, foundations, ponds, swales, drainage, etc.	Negative	Moderate	Local	Certain	Permanent	Irreversible
		Airbourne dust arising from soil stockpiles causing nuisance dust on public roads and neighbouring properties.	Negative	Slight	Local	Unlikely	Short	Worst Case
		Imported fill material shall be required as part of works.	Negative	Slight	Local	Likely	Permanent	Irreversible
		Excavation of top soil material.	Positive	Slight	Local	Certain	Permanent	Irreversible
		Excavation of subsoils can serve to reduce the local groundwater levels as the water table naturally lowers to a new equilibrium below the artificial ground level.	Negative	Moderate	Local	Unlikely	Permanent	Worst Case
		Seepage of underlying groundwater.	Negative	Slight	Local	Likely	Short	Worst Case
		Discharge of contaminated groundwater to adjacent watercourse.	Negative	Slight	Local	Unlikely	Short	Worst Case
Groundwater Abstraction	Foundation Excavation Boardwalk Construction	Groundwater abstraction associated with temporary dewatering forcing changes in pore water pressures and potential settlement and/ or subsidence in downstream unconsolidated sediments.	Negative	Significant	Local & Regional	Unlikely	Short	Worst Case
Groundwater Flow Paths		Groundwater flow paths may be potentially altered due to the construction of sub-surface structures. Groundwater mounding can theoretically occur where large impermeable structures are placed perpendicular to groundwater flow paths.	Negative	Significant	Local & Regional	Unlikely	Permanent	Worst Case
Groundwater Quality		Potentially contaminated water generated within the excavation could impact the southern marsh.	Negative	Significant	Local & Regional	Unlikely	Short	Worst Case

Operational Phase

During the Operational Phase of the Project there is limited impact on the geological environment of the area. The site has been designed to mitigate any soil contamination which may occur during the operational phase of the Project.

Summary

Table 6.2 above summarises the identified likely significant effects during the construction phase of the Project before mitigation.

It is considered that there is limited impact on the geological environment of the area during the operation phase and therefore no further assessment is required for the operational phase of the project.

6.6 Potential Cumulative Impacts

Approved Plans/ Projects

The site is adjacent to a recently granted 84 units scheme which was submitted by the same client as this application relates to (ABP Ref. ABP-319604-24 & Wicklow Co. Co. Ref. 23/756). The site is also adjacent to the KWETB proposed school site (Planning Ref. 22/213), which has received planning permission by Wicklow County Council.

It is not likely that the Project will result in any negative significant cumulative effects on Lands and Soils in combination with these projects.

Future Plans/ Projects

This submission consists of the initial phase of a large residential development, to be provided over the coming years. The overall proposed masterplan seeks to provide c.1500 residential units, creches, local centre, the first phase of a future regional road for Arklow town, new roads connecting the site to the surrounding areas and a pedestrian / cycle path.

It is not likely that the Project will result in any negative significant cumulative effects on Lands and Soils in combination with the future masterplan development.

6.7 Mitigation Measures

Construction Phase

The following sections describe the mitigation measures which shall be adopted as part of the construction works on site to reduce the potential impacts on the soils, geology environment.

Control of Excavations and Export of Material Arising from the Site

The proposed works shall incorporate, as identified in the Construction Environmental Management Plan submitted with this LRD Application submission, the reduce, reuse and recycle approach in relation to the excavation of soil on site. All excavation arisings shall be, where possible, reused on site. Stockpiles have the potential to cause negative impacts on air and water quality; therefore, the effects of soil stripping and stockpiling shall be mitigated through the implementation of an appropriate earthworks handling protocol implemented by the Contractor during the Construction Phases. Stockpiles shall be formed within the boundary of the excavation zone and there shall be no direct link or pathway from this zone to any surface water body. Only local/low level of stockpiling shall occur as the bulk of the material to be excavated shall be paced directly into haulage vehicles for transport off site to an appropriately licensed facility or, where possible, will be reused in other areas of the site as fill. The Contractor shall implement dust suppression

measures, vehicle wheel washes, road sweeping and general housekeeping to ensure that the surrounding environment is free of nuisance dirt and dust dirt on roads.

Export of Material Arising from Site

Where demolition and construction material, such as excavated material, cannot be reused on site it shall be transported for recovery/disposal at an appropriately licenced facility as outlined in the Construction Environmental Management Plan. Following the geo-environmental sampling and associated laboratory testing, the waste classification completed on the soils has found that all results indicate that the materials are free from asbestos and are classified as a non-hazardous soil waste suitable for disposal at an inert landfill facility. Additional Soil Classification shall be carried out as part of the Construction Phases and waste shall be delivered by the Contractor to licensed Waste facilities which are authorised under the Waste Management Act 1996, as amended, and which hold the appropriate certificate of registration, Waste facility permits or EPA licence.

Control of Water During the Construction Phases

The Contractor shall carry out the earthwork and excavation activities such that surfaces, as they are being raised, shall be designed with adequate drainage, falls and profile to control run-off and prevent ponding and flowing silts. The Contractor shall exercise care to ensure that exposed soil surfaces are stable in order to minimise erosion and that all exposed soil surfaces shall be within the main excavation site thus limiting the potential for any offsite impacts. All surface water run-off shall be prevented from directly entering into any water courses whatsoever in accordance with the Construction Environmental Management Plan. During the excavation of the existing site for the pond structures and foundation excavations, surface water shall pond in the excavations. The Contractor shall implement pre-treatment and silt reduction measures on site and shall include a combination of silt fencing, settlement measures (silt traps, silt sacks and settlement tanks) and hydrocarbon interceptors (as outlined in the Construction Environmental Management Plan). Qualitative and quantitative monitoring shall be implemented, with the client's Environmental Consultant auditing the Contractor's regular sampling and analysis results.

Sources of Fill Material / Aggregates for the Site

The Contractor shall source all imported fill and aggregate for the Project from reputable suppliers and shall ensure the following

- Aggregate Declarations of Performance for the classes of material specified,
- Environmental Management status and the Regulatory and Legal Compliance status of the proposed suppliers.

The Contractor may consider recycled or recovered materials as aggregates for the Project where appropriate.

Fuel and other Hazardous Substance Handling, Transport and Storage

The Contractor shall implement the following mitigation measures on site in order to prevent any spillages to ground of fuels and prevent any resulting soil and/or groundwater quality impacts:

- Dedicated bunded refuelling areas,
- Provision of spill kits for hazardous substances,

Diesel/ petrol powered equipment to be placed on suitable drip trays.

Construction Environmental Management Plan

A Construction Environmental Management Plan for the Project has been submitted with this LRD Application Submission. The Construction Environmental Management Plan sets out the minimum requirements which will be adhered to during the construction phase of the Project to help ensure that construction activities are planned and managed in accordance with the environmental requirements identified within and the relevant guidance and legislation.

The Construction Environmental Management Plan will form part of the Contract Documents for the construction stage to ensure that the Contractor undertakes the works required to implement mitigation measures.

Operational Phase

As noted above there is limited impact on the geological environment of the area expected during the operational phase of the development

6.8 Predicted Impacts

Construction Phase

The predicted impacts of the construction phase are described in Table 6.3 in terms of quality, significance, extent, probability and duration. The relevant mitigation measures are detailed and the residual impacts are determined which take account of the mitigation measures.

After the implementation of the mitigation measures outlined below, the proposed development will not give rise to any significant long-term adverse impact. Negative impacts during the construction phase will not be significant once the appropriate mitigation measures are adopted and will be only short term in duration.

Table 6.3: Construction Phase Impact Determination

Activity	Construction Element	Potential Impact Description	Quality	Significance	Extents	Probability	Duration	Type	Mitigation	Residual Impact
Earthworks	Pond/ Attenuation Excavation Pond/ Attenuation Construction Foundation Excavation Boardwalk Construction	Excavation of natural soils and subsoil for	Negative	Moderate	Local	Certain	Permanent	Irreversible	The minimum amount of space required in order to construct the works have been allowed for. Excavated material, where possible, shall be reused on the site	Moderate Negative
		Airbourne dust arising from soil stockpiles causing nuisance dust on public roads and neighbouring properties.	Negative	Slight	Local	Unlikely	Short	Worst Case	The contractor shall implement dust suppression measures to minimise the generation of dust during dry weather periods. Dust monitoring shall be carried out by the contractor throughout the excavation works. Construction vehicle wheel wash facilities shall be provided on all site exits and the contractor shall implement a road sweeping programme for the duration of the works.	Imperceptible Negative
		Imported fill material shall be required as	Negative	Slight	Local	Likely	Permanent	Irreversible	The contractor shall only source fill material with the requisite declarations of performance to ensure material supplied complies with the relevant project material specifications.	Imperceptible Negative
		Excavation of top soil material.	Positive	Slight	Local	Certain	Permanent	Irreversible	The Contractor shall implement environmental sampling and testing of top soil to assess its potential suitability for landfills in the Republic of Ireland via comparison aginst the Landfill Waste Acceptance Criteria .Limits	Slight Positive
		Excavation of subsoils can serve to reduce the local groundwater levels as the water tablenaturally lowers to a new equilibrium below the artificial ground level.	Negative	Moderate	Local	Unlikely	Permanent	Worst Case	The contractor shall install groundwater monitoring wells which shall be continously monitored during earthworks on site. The impact of lowering the groundwater levels shall be minimum	Imperceptible Negative
		Seepage of underlying groundwater.	Negative	Slight	Local	Likely	Short	Worst Case	The contractor shall implement the localised lowering of the water table through pumping of wells	Imperceptible Negative
		Discharge of contaminated groundwater to adjacent watercourse.	Negative	Slight	Local	Unlikely	Short	Worst Case	The contractor shall design on site pre- treatment of groundwater prior to its discharge to the adjacent watercourse/ Marsh	Imperceptible Negative
Groundwater Abstraction		Groundwater abstraction associated with temporary dewatering forcing changes in pore water pressures and potential	Negative	Significant	Local & Regional	Unlikely	Short	Worst Case	Condition Surveys should be completed on adjacent properites and neighbourin sites and should be monitored during the construction works	Imperceptible Negative
Groundwater Flow Paths		Groundwater flow paths may be potentially altered due to the construction of sub-surface structures. Groundwater mounding can theoretically occur where large impermeable structures are placed perpendicular to groundwater flow paths.	Negative	Significant	Local & Regional	Unlikely	Permanent	Worst Case	Local dewatering will be required as the excavations remove overlying low permeability clays which act as a confining layer	Imperceptible Negative
Groundwater Quality		Potentially contaminated water generated within the excavation could impact the southern marsh.	Negative	Significant	Local & Regional	Unlikely	Short	Worst Case	In order to avoid the inadvertant pollution of Surface and groundwater resoirces, all runoff should be prevented from directly entering watercourses. Best practices and correct handling and storgae of potentially polluting substance should be adhered	Imperceptible Negative

Operational Phase

During the Operational Phase of the Project there is a neutral, permanent, imperceptible impact on the local and regional geological environment

6.9 'Do Nothing' Scenario

In the 'Do Nothing' scenario, if the construction of the development at the proposed site does not take place, the existing baseline conditions will remain and there would be no resulting additional impacts on the Soils or Geology in the area of the Project site.

6.10 Worst Case Scenario

The "worst-case" scenario is the accidental release of diesel fuel or spillage of other similar hazardous materials occurring on site during the Construction phase, through the failure of secondary containment or a materials handling accident on the site. If this were to occur in an open excavation it could lead to these materials infiltrating through the soil contaminating the soil zone and any underlying groundwater which is an adverse, significant and temporary effect. Appropriate remediation measures would then be required depending on the nature and extent of any contamination caused under such a scenario and may include the excavation and treatment of contaminated soil and associated in-situ remediation techniques.

The contractor must adhere to the CEMP to ensure that all containment is kept in working order to avoid this scenario occurring.

6.11 Monitoring & Reinstatement

Monitoring

The Contractor shall implement pre-treatment and silt reduction measures on site and shall include a combination of silt fencing, settlement measures (silt traps, silt sacks and settlement tanks) and hydrocarbon interceptors (as outlined in the Construction Environmental Management Plan). Qualitative and quantitative monitoring shall be implemented, with the client's Environmental Consultant auditing the Contractor's regular sampling and analysis results.

Reinstatement

Not applicable.

6.12 Difficulties in Compiling Information

The design team have produced a coordinated design to minimise environmental impacts and to ensure a sustainable and integrated approach to the design of the Project. There were no difficulties in compiling the information.

6.13 References

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018)
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017)

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports – (EPA, 2022)
- Guidelines on the Information to be contained in Environmental Impact Assessment Reports DRAFT (EPA, August 2017);
- Advice Notes for preparing Environmental Impact Statements DRAFT (EPA, September 2015);
- Guidelines on Information to be contained in Environmental Impact Statements (EPA, 2002);
- Advice Notes on Current Practice in the preparation of Environmental Impact Statements (EPA, 2003);
- Guidelines for the preparation of Soils Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013);
- Geology in Environmental Impact Statements, A Guide (IGI, 2002);
- Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA 2009);
- Control of Water Pollution from Construction Sites (CIRIA, 2001); and Environmental Handbook for Building and Civil Engineering Projects (CIRIA, 2000).
- The assessment followed a phased approach as outlined in Chapter 4.4 of the Advice Note (EPA, 2015) and the IGI Guidelines (IGI 2013).

7. Hydrology and Water Services

7.1 Introduction

This chapter of the EIAR evaluates the likely significant effects, if any, which the proposed development will have on hydrology (surface water) and hydrogeology (groundwater). This chapter contains necessary information as defined in the Environmental Protection Agency (EPA) 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2023).

The chapter initially provides a description of the receiving environment of the site and the potential impacts of the development. When assessing the potential impacts, this assessment considers the significance of the environmental attributes, and the predicted scale, and duration of the likely effects.

The chapter also outlines the proposed mitigation measures that will reduce or eliminate the identified potential impacts and defines the residual effects of the proposed development (the effect after the implementation of mitigation measures).

This chapter should be read in conjunction with Chapter 6 "Land, Soils and Geology" submitted with the planning application. A full description of the proposed development is set out in Chapter 2 "Development Description" of this EIAR.

7.2 Methodology

Criteria for Rating Effects

This section establishes the criteria, and guidance used to rate the significance of the potential impacts of the proposed development project on the land, soil and geological aspects of the site and surrounding area.

Alongside the legislation, policy, and guidance outlined in Chapter 1, this chapter is prepared in line with the 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2022) and due consideration is also given to the guidelines provided by the Institute of Geologists of Ireland (IGI) in the document entitled 'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements' (IGI 2013).

The document entitled 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the Transport Infrastructure Ireland (TII) formerly National Roads Authority (NRA) (TII, 2009) is referenced where the methodology for assessment of impact is appropriate. Furthermore, in line with the TII Guidelines, an assessment of the attribute importance has been undertaken in order to provide a basis for the assessment of impact provided. The attribute importance considers the potential as well as the existing use of the surface water features as a water resource i.e., water supply, fisheries and other uses, as well as ecological habitat requirements.

The quality, significance, and duration of the potential impacts, residual effects, and cumulative effects are described using standard EIA descriptive terminology, included in Chapter 1 of this EIAR.

The principal attributes (and effects) to be assessed include the following:

- Water Framework Directive (WFD) Status and potential for increased risk of deterioration of this status due to the activities of the site.
- River and stream water quality in the vicinity of the site (where available).

- Surface, transitional and coastal watercourses near the site and potential impact on surface water quality arising from Proposed Development related works including any discharge of surface water run-off.
- Localised flooding (potential increase or reduction) and floodplains including benefitting lands and drainage districts (if any); and
- Surface water features within the area of the site.
- High-yielding water supply wells/ springs in the vicinity of/ within the site boundary to within a 2km radius and the potential for increased risk presented by the Proposed Development;
- Classification (regionally important, locally important etc.) and extent of aquifers underlying the site boundary area;
- Increased risks presented to the groundwater bodies by the Proposed Development associated with aspects such as, for example, the removal of subsoil cover, removal of aquifer (in whole or part thereof), spatial drawdown in water levels, alteration in established flow regimes, and changes in local/ regional groundwater quality;
- Natural hydrogeological/ karst features in the area and potential for increased risk presented by the activities at the site; and
- Groundwater-fed ecosystems and the increased risk presented by operations both spatially and temporally.

Relevant Legislation & Guidance

This impact assessment was undertaken having regard to the following legislation and guidance:

- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022).
- Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (TII, 2009, previously NRA). The TII criteria for rating the hydrogeological and hydrological related attributes are presented in Appendix 9.12.1, 9.12.2 and 9.12.3 of this EIAR.
- Water Framework Directive 2000/60/EC.

The strategies and objectives of the WFD in Ireland have influenced a range of national legislation, regulations and guidelines. These include the following:

- European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003);
- European Communities (Drinking Water) Regulations 2014 (S.I. 122 of 2014);
- European Communities Environmental Objectives (Surface Waters); Regulations, 2009 (S.I. No. 272 of 2009 as amended SI No. 77 of 2019)
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010 S.I. No. 366 of 2016);
- European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2010 (S.I. No. 610 of 2010); and
- European Communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011 (S.I. No. 489 of 2011);
- Statutory Instrument (SI) No. 293 of 1988 European Communities (Quality of Salmonid Waters) Regulations 1988
- Local Government (Water Pollution) Acts 1977-1990
- SI No. 258 of 1988 Water Quality Standards for Phosphorus Regulations 1998

- Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites (Eastern Regional Fisheries Board);
- Central Fisheries Board Channels and Challenges – The enhancement of Salmonid Rivers;
- CIRIA C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors;
- CIRIA C648 Control of Water Pollution from Constructional Sites; and
- Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (NRA/TII, 2006).

Sources of Information

- Environmental Protection Agency (EPA) – website mapping and database information. Envision water quality monitoring data for watercourses in the area;
- Geological Survey of Ireland (GSI) - on-line mapping, Geo-hazard Database, Geological Heritage Sites & Sites of Special Scientific Interest, Bedrock Memoirs and 1:100,000 mapping;
- River Basin Management Plan for Ireland 2018-2021.
- Water Action Plan 2024 - A River Basin Management Plan for Ireland, (Department of Housing Local Government & Heritage, Sept 2024).
- Cork County Council Development Plan 2022-2028.
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW);
- Office of Public Works (OPW) flood mapping data (www.floodmaps.ie)
- Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA 532, 2001); and
- National Parks and Wildlife Services (NPWS) – Protected Site Register.
- Hydrometric data (www.floodinfo.ie/map/floodmaps/), OPW CFRAM Flood Risk Mapping, www.epa.ie/hydronet.

Site specific data was derived from the following sources:

- Site plans and drawings submitted with the planning application pack
- Consultation with the engineering team.
- Greenway Boardwalk: Outline Construction Methodology (DOBA, 2025).
- Infrastructure Design Report (LRD Application Submission). Lands at Kilbride, Arklow, Co.
- Wicklow (DOBA, 2025).
- Site Specific Flood Risk Assessment (Section 32B Submission) (DOBA, 2024).

7.3 Receiving Environment

General Site Location

The proposed development is located on "Lands at Kilbride", Arklow, Co. Wicklow. The site is c.28.47ha and is generally bounded by the town marsh to the south, M11 to the west, housing at Avondale Crescent/ Murrell Drive and St Joseph's School to the east and the Kilbride Industrial estate and Kilbride Road L-6179 to the north.

Hydrology

Hydrological Environment

The Proposed Development site lies within the Avoca-Vartry Catchment (Hydrometric Area 10) and Avoca River sub-catchment (WFD name: Avoca_SC_020, Id 10_9) (EPA, 2025) which is managed by the Wicklow County Council (WCC).

The Arklow Town Marsh is located north of the Avoca Estuary Transitional Waterbody (WFD Code: IE_EA_150_0100) on the perimeter of Arklow Town (refer to **Error! Reference source not found.** below). A pedestrian laneway runs in a general east to west direction through the site. The majority of the marsh is covered by a wet grassy compound. The area is designated as a proposed Natural Habitat Area (pNHA; site code 1931). There is a river waterbody (Marsh Stream, associated with Avoca_030 waterbody, WFD Code IE_EA_10A031140) associated with the drainage of the marsh and outfalls into the Avoca Estuary c. 500 downstream of the proposed boardwalk.

Figure 7.1: Hydrological Map

Surface Water Quality

Surface water quality is monitored periodically by the EPA at various regional locations along with principal and other smaller watercourses. The EPA assess the water quality of rivers and streams across Ireland using a biological assessment method, which is regarded as a representative indicator of the status of such waters and reflects the overall trend in conditions of the watercourse. The biological indicators range from Q5 - Q1. Level Q5 denotes a watercourse with good water quality and high community diversity, whereas Level Q1 denotes very low community diversity and bad water quality.

In relation to the Proposed Development site, the nearest (active) surface river waterbody EPA monitoring station is '*Avoca Bridge*' located c. 10 km upstream the proposed development, in the Avoca_020 river waterbody which outfalls into Avoca Estuary.

The Environmental Protection Agency (EPA, 2025) on-line mapping presents the available water quality status information for water bodies in Ireland.

The Avoca Estuary Transitional Waterbody has a WFD status (2016-2021) of 'Moderate' and a WFD risk score of 'At risk of not achieving Good Status'. The Avoca_030 river waterbody that drains the mashland has a WFD status (2016-2021) of 'Moderate' and a WFD risk score of 'Not at risk'.

According to the EPA (2025), the Avoca Estuary failed to achieve good status due to exceedance in cadmium, copper, lead and zinc, in addition to moderate hydromorphological and oxygenation conditions. The moderatre status for the Marsh Streram is based on expert judgement as there are no water quality station associated with this waterbody.

Flood Risk

The marshland is subject to fluvial and coastal flooding (refer to CFRAM maps, presented in

and **Error! Reference source not found.** below).

According to the Site-Specific Flood Risk Assessment (SSFRA) SSFRA carried out by DOBA Consulting Engineers, the proposed greenway and associated embankments located within the flood zone to the south of the site have been calculated to displace approximately 2900m3 of flood volume during the 1:1000-year event. The assessment proposes to provide compensatory storage in the southern greenspace (located in Flood Zone C) to account for any displaced volume lost to the greenway embankments. An area of approximately 2635m2 has been identified as being suitable to regrade the ground 1.1m lower than existing to allow for lost flood volume to be catered for.

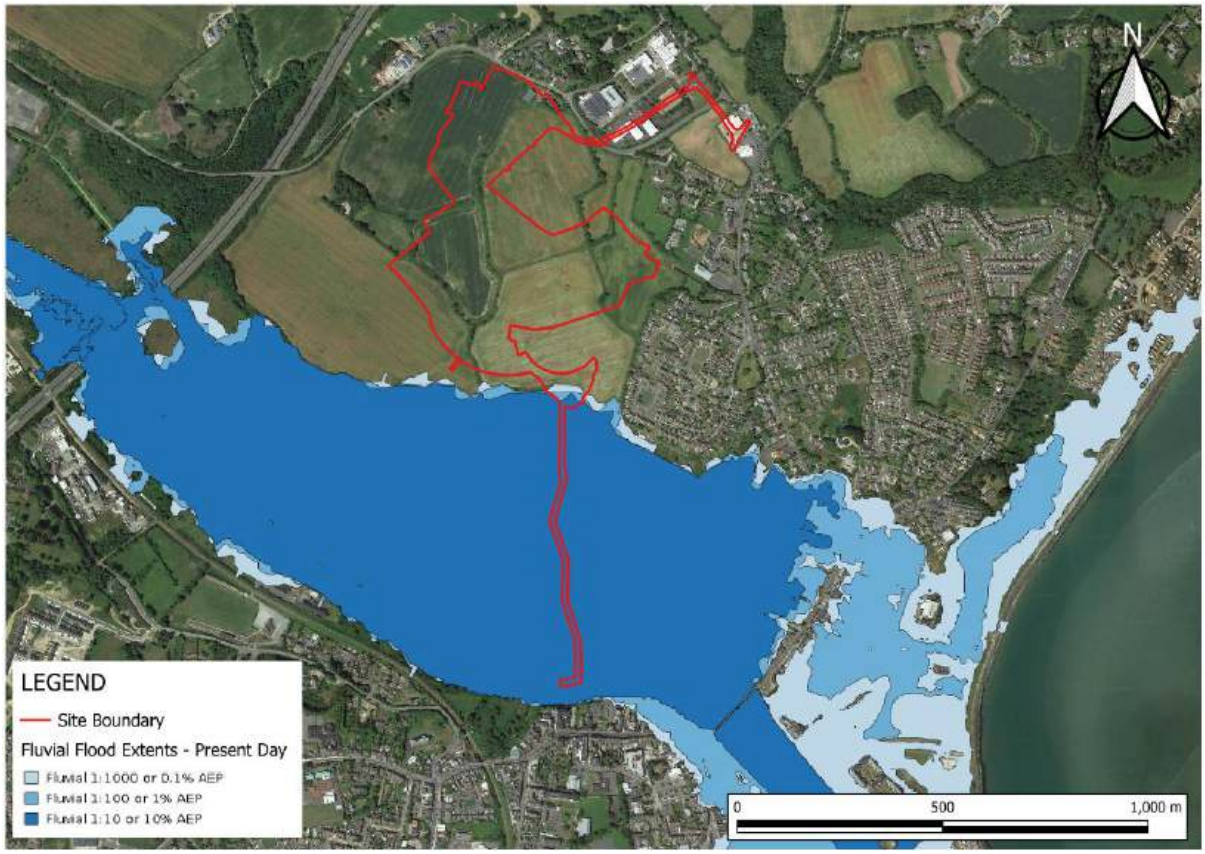


Figure 7.2: CFRAM Fluvial Flooding Map

Figure 7.3: CFRAM Coastal Flooding Map

Existing Surface Water Drainage

There is no formal surface water network on site with run-off from the greenfield eventually discharging via overland flows and adjacent dry ditches to the Marsh area, located to the south of the proposed development.

Rating of Site Importance of the Hydrological Features

The review of the receiving environment, as detailed in the sections above and based on the TII methodology (2009), indicates that the hydrogeological features at this site are of Very High' importance. This is due to the presence of a wetland ecosystem protected by national legislation (Avoca Marsh pNHA).

Areas of Conservation

The NPWS (2025) on-line database have been reviewed to determine the location of areas of conservation within proximity to the Proposed Development site, and there are no Special Protected Areas (SPA) established under the EU Birds Directive (79/409/EEC), or Special Areas of Conservation (SAC) established under the Habitats Directive on or within the boundary of the Proposed Development site. As mentioned above, the Avoca Marsh is designated as a proposed Natural Habitat Area (pNHA; site code 1931) established under the Wildlife Acts, 1976 and 2000 (as amended).

Hydrogeology

General

A previous site investigation was conducted by the Flood Relief Scheme Design Team in 2019. Boreholes drilled as part of this site investigation indicated varying soil profiles, generally ranging as follows:

- 0 – 1.0m below ground: Peat/Silt
- 1.0m – 1.5m Silty Sand
- 1.5m – 3.0m Sand

Groundwater monitoring was carried out at installed standpipes that were installed at 5 No. locations across the marsh during September-October 2019 for a 6-week period to establish the hydrogeological regime of the marsh. During periods of no rainfall, the water level was recorded below ground level at the various test locations. For the remainder of the test period (i.e., after rainfall events), water levels recorded were above ground, showing a direct response to precipitation.

Inspection of Mapping from the Geological Society of Ireland indicates the bedrock underlying the site is part of the Kilmacrea Formation (code KA) which is described as dark grey slate, minor pale sandstone.

Aquifer Classification

The GSI has devised a system for classifying the bedrock aquifers in Ireland. The aquifer classification for bedrock depends on a number of parameters including, the area extent of the aquifer (km2), well yield (m3 /d), specific capacity (m3 /d/m) and groundwater transmissivity (mm3 /d). There are three main classifications: regionally important, locally important and poor aquifers. Where an aquifer has been classified as regionally important, it is further subdivided according to the main groundwater flow regime within it. This sub-division includes regionally important fissured aquifers (Rf) and regionally important karstified aquifers (Rk). Locally important aquifers are sub-divided into those that are generally moderately productive (Lm) and those that are generally moderately productive only in local zones (Ll). Similarly, poor aquifers are classed as either generally unproductive except for local zones (Pl) or generally unproductive (Pu).

The GSI (2025) National Aquifer Map identifies gravel and bedrock aquifers beneath the subject site and they are classified as 'Locally Important Gravel Aquifer – Valley Setting' and 'Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones', respectively (refer to **Error! Reference source not found.** below).

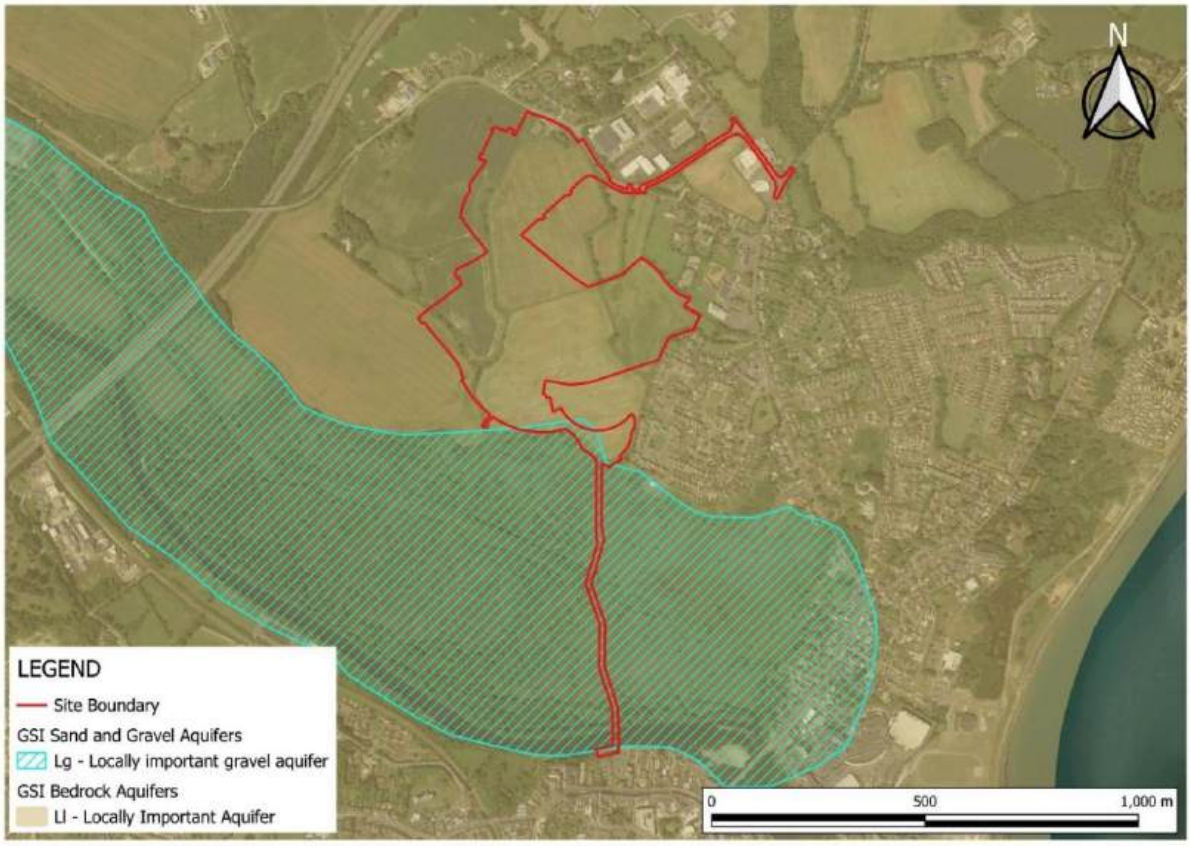


Figure 7.4: Aquifer Classification Map (Source: GSI, 2025)

Aquifer Vulnerability

Aquifer vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated generally by human activities. Due to the nature of the flow of groundwater through bedrock in Ireland, which is almost completely through fissures/ fractures, the main feature that protects groundwater from potential contamination, and therefore the most important feature in the protection of groundwater, is the subsoil (which can consist solely of or of mixtures of peat, sand, gravel, glacial till, clays or silts).

Groundwater vulnerability is an indication of how easily the aquifer can become contaminated by human activity. It is dependent on the thickness and permeability of the overlying soils and depth to the water table. For example, a bedrock aquifer with minimal thickness of overburden or with a thin layer of permeable overburden will be more vulnerable to contamination than a bedrock aquifer which has a thick layer of low permeability overburden. Extreme groundwater vulnerability is also associated with karst landforms as these are a direct pathway for water and contaminants to enter the aquifer from the surface.

The GSI (2025) guidance presently classifies the bedrock aquifer vulnerability in the region of the subject site as 'Moderate' which indicates a general overburden depth >10m for moderately permeable sandy subsoils such as the existing subsoil in the marshland. This shows that the bedrock regional aquifer is moderately well protected by the marsh and alluvial deposits, although the water

level associated with the gravel aquifer level is shallow and sensitive to local rainfall. The aquifer vulnerability class in the region of the site is presented as **Error! Reference source not found.** below.

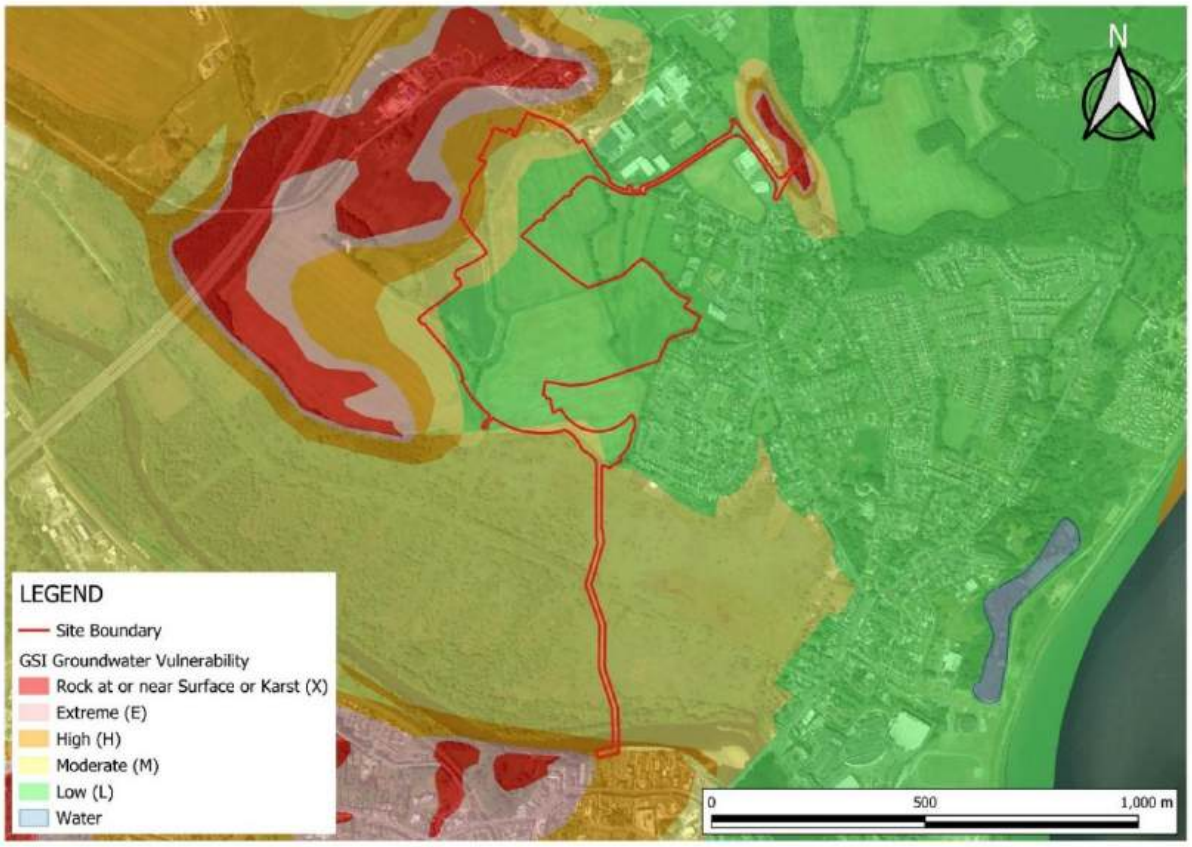


Figure 7.5: Groundwater Vulnerability Map (Source: GSI, 2025)

Groundwater Quality

The Water Framework Directive (WFD) 2000/60/EC was adopted in 2000 as a single piece of legislation covering rivers, lakes, groundwater, transitional (estuarine) and coastal waters. In addition to protecting said waters, its objectives include the attainment of 'Good Status' in water bodies that are of lesser status at present and retaining 'Good Status' or better where such status exists at present. 'Good Status' was to be achieved in all waters by 2015, or at least by 2027 as well as maintaining 'high status' where the status already exists. The EPA co-ordinates the activities of the River Basin Districts, local authorities and state agencies in implementing the directive, and operates a groundwater quality monitoring programme undertaking surveys and studies across the Republic of Ireland.

The proposed development is within the 'Wicklow' groundwater body (European Code: IE_EA_G_076) whose most recent WFD groundwater status (2016-2021) is 'Good' and its current WFD risk score is 'At risk of not achieving Good Status' by 2027.

Groundwater Wells

The GSI Well Card Index is a record of wells drilled in Ireland, water supply and site investigation boreholes. It is noted that this record is not comprehensive as licensing of wells is not currently a requirement in the Republic of Ireland. The current well index shows there are no wells are located within the boundary of the Proposed Development site.

The well card data presented in Table 7.1 shows the occurrence of recorded wells within a 2km radius of the site area, information regarding the depth to bedrock, and hence the depth of overburden is

noted for each well where available. See **Error! Reference source not found.** below for locations. From the GSI well card data presented in Table 7.1, it can be seen that abstractions of up to 300 m3/day are obtained from the bedrock aquifer at well 3217SWW078, which is located approx. 1.1km to the northeast from the site. In the surrounding area of the site, yield class ranges 'Poor' to 'Moderate' as it can be seen in the borehole 3217SWW043, historically located adjacent to the western boundary of the site that was drilled for domestic use (probably inactive currently).

GSI Name	Type	Depth (m)	Townland	Source Use	Yield Class	Yield (m3d)
3217SWW077	Borehole	48.7	Knockanrahan Upper	Domestic use only	Moderate	80
3217SWW078	Borehole	30	Templerainy	Domestic use only	Good	300
3217SWW079	Borehole	17.9	Seabank	Unknown		0
3217SWW081	Borehole	3.5	Shelton	Unknown		0
3217SWW083	Borehole	15	Seabank	Unknown		0
3217SWW010	Borehole	30.5	Coolboy	Domestic use only	Moderate	44
3217SWW011	Borehole	25.9	Seabank	Domestic use only	Poor	33
3217SWW012	Borehole	27.4	Ballinaheese	Domestic use only	Poor	27
3217SWW037	Dug well	3.7	Raheen	Domestic use only		0
3217SWW038	Borehole	47.2	Shelton Abbey	Domestic use only	Poor	33
3217SWW040	Borehole	120	Ballyraine Lower	Other	Poor	3
3217SWW041	Borehole	61	Ballyraine Lower	Industrial use	Good	120
3217SWW042	Borehole	61	Ballyraine Lower	Domestic use only	Poor	35
3217SWW043	Borehole	61	Kilbride	Domestic use only	Poor	22
3217SWW044	Borehole	30.5	Shelton	Domestic use only	Poor	33
3217SWW023	Borehole	27.4	Tinahask	Domestic use only	Poor	27
3217SWW048	Borehole	48.7	Arklow	Industrial use	Moderate	55
3217SWW051	Borehole	45.7	Arklow Dublin Rd	Domestic use only	Moderate	87
3217SWW052	Borehole	53.3	Arklow	Domestic use only	Good	160
3217SWW053	Borehole	45.7	Arklow	Domestic use only	Moderate	55
3217SWW003	Borehole	29.6	Templerainy	Domestic use only	Poor	27
3217SWW006	Borehole	31.7	Killiniskyduff	Domestic use only	Poor	21.8
3217SWW007	Borehole	27.4	Tinahask Lower	Domestic use only	Poor	22
3217SWW008	Borehole	60.6	Arklow	Domestic use only	Poor	11
3217SWW009	Borehole	69.5	Arklow	Domestic use only	Poor	11
3217SWW029	Borehole	21.6	Shelton Abbey	Unknown	Moderate	55
3217SWW030	Borehole	30.5	Shelton Abbey	Unknown	Moderate	65
3217SWW031	Borehole	27.7	Shelton Abbey	Unknown	Moderate	65
3217SWW032	Borehole	23.4	Shelton Abbey	Unknown	Moderate	65
3217SWW057	Borehole	48.8	Raheen	Domestic use only	Moderate	55
3217SWW059	Borehole	91.4	Ballyduff	Unknown	Good	151
3217SWW061	Borehole	23.8	Ticknock	Unknown	Poor	22
3217SWW062	Borehole	9	Abbeylands	Industrial use	Moderate	60
3217SWW063	Borehole	7.4	Abbeylands	Other	Poor	10
3217SWW064	Borehole	5.9	Tinahask Upper	Other	Poor	12
3217SWW098	Borehole	36.6	Coolboy	Agricultural & domestic	Moderate	43.6

GSI Name	Type	Depth (m)	Townland	Source Use	Yield Class	Yield (m3d)
3217SWW101	Borehole	31.4	Shelton	Agricultural & domestic	Moderate	87.3

Table 7.1: GSI Well Card Data for the Site location and Surrounding Area (GSI, 2025)

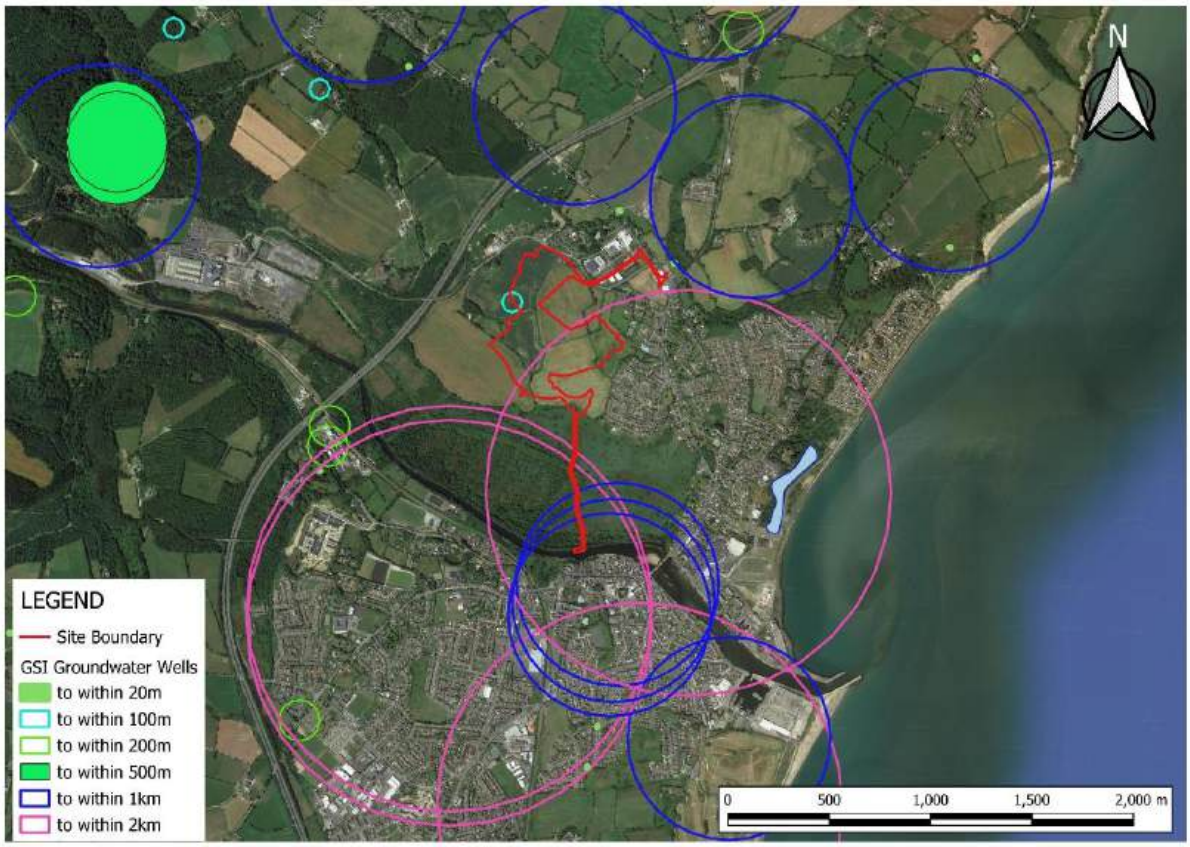


Figure 7.6: GSI Well Map (Source: GSI, 2025)

Rating of Site Importance of the Hydrogeological Features

The review of the receiving environment, as detailed in Section 6.3.9 and based on the TII methodology (2009), indicates that the hydrogeological features at this site are of 'Very High' importance. This is due to the aquifer beneath the site supports a wetland ecosystem protected by national legislation (Avoca Marsh pNHA).

7.4 Characteristics of the Proposed Development

Description of Site

The proposed mixed use large scale Residential Development will result in the demolition of an existing dwelling and 2 no. sheds/outbuildings and the construction of 666 no. residential units with a mix of semidetached and terraced houses along with duplex apartments and apartments. These will comprise 1, 2, 3 and 4 bed units. All residential units will have associated private open space facing north/ south/ east/ west. The proposal will also deliver a local centre containing 3 no. retail units, 3 no. community/ medical units and 1 no. creche unit.

A new pedestrian/ cyclist link is provided via a new boardwalk and bridge across the marsh and over the Avoca River adjoining the existing greenway and the Main Street. A new road providing vehicular

access is also proposed connecting to the north to Kilbride Road along with road improvements in the surrounding area.

The development will also provide for landscaping, public open spaces and all associated site development works to enable the development including boundary treatments, attenuation storage area and other service provision including ESB works.

Proposed Water Infrastructure

In line with the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS), Sustainable Urban Drainage System (SuDS) and WCC CDP it is proposed to provide a treatment system aimed at enhancing the quality of surface water from the development which will be achieved by intercepting rainfall and other run off and treating the surface water prior to discharge to the adjacent watercourse. Following a review of the site layout and the ground conditions, the systems considered most appropriate are permeable/ porous surfaces and bio retention/ tree pits supplemented by rainwater harvesting, petrol interceptor, flow control devices, retention basins and underground attenuation. Attenuated surface water shall discharge to an existing local watercourse, where eventually flows shall be conveyed to the Arklow Marsh area.

The site will implement a SuDS strategy that will provide attenuation for surface water runoff including the 1 in 100 year storm + 20% Climate Change event + 10% Urban Creep. The proposed basins shall contain water levels that will be designed to provide a minimum of 300mm freeboard to adjoining ground and road levels while also providing a minimum of 500mm freeboard to finished floor levels of all buildings on the site.

As part of the development, it is proposed to accommodate Greenway infrastructure to provide access from the site to Arklow Town.

Wastewater flows generated from the proposed development shall be conveyed to the south with Wastewater infrastructure constructed fully coordinated with the proposed upgrade works before discharging to the upgraded UE wastewater infrastructure and Arklow WWTP.

With the development located adjacent to the discharging watercourse to the east, consideration has been given in the site layout to the protection of wildlife and the reduction of impacts on the existing riparian environment along the watercourse. The site layout and design has followed the Inland Fisheries Ireland's guidance documents 'Planning for Watercourses in the Urban Environment' and a 25.0m riparian buffer along the watercourse has been considered to protect and enhance the riparian environment to the adjacent watercourse.

7.5 Potential Impacts

Construction Phase

Impacts on Water Quality

The construction of infrastructure near watercourses poses a significant risk in terms of contamination arising from spillages and sediment transport areas which can lead to degradation of water quality, ecological damage and flooding. The boardwalk support structures will not be constructed in-stream, but rather in the marsh (which is a flood plain), over timber bog mats. However, additional piles will be constructed in the Avoca River. It should be noted that these piles will be constructed whilst by Wicklow County Council is constructing the debris trap columns. These debris trap columns will be provided by Wicklow County Council as part of the Avoca River Flood Relief scheme and are not part of the proposed development. Although it will provide access to the in-stream construction works.

It should be also noted that, as the groundwater level in the marsh are shallow and seasonally over ground level, it will be likely that construction works in this area will be carry out when this water is exposed meaning potential for changes to the local hydrological regime in the marsh and its final receptor (Avoca Estuary).

The main contaminants arising from construction activities and runoff includes the following:

- Increase of silt and sediment loading arising from construction site runoff. Elevated silt loading can lead to long-term damage of aquatic ecosystems in the marsh or downstream in Avoca Estuary by overloading spawning grounds and gravel beds. Increase silt loads reduces aquatic plant growth, limits dissolved oxygen capacity and overall reduces the ecological quality with the most critical period associated with low-flow conditions. Other pollutants in the watercourse can bind to silt which can lead to increased bioavailability of these pollutants. It should be noted that this effect will be attenuated by the use of bog mats; no backfilling or earthworks are foreseen
- Spillage of cementitious products such as concrete, grout and epoxies. Cementitious based products are highly alkaline and extremely corrosive which can result in significant impact to watercourses by altering the pH, smothering stream beds and physically damaging fish. However, it should be noted, that the only concrete work projected will be within the filly enclosed steel pile.
- Accidental Spillage of hydrocarbons from construction compound.
- Faecal contamination arising from inadequate treatment of on-site ablution and washing facilities.

The above construction activities will require localised clearance although removal of topsoil/subsoil is not foreseen. These works would potentially increase the erosion potential of the area during heavy rainfall and flooding events during which sediment can be transferred to the river via overland flow. As mentioned above, the use of bog mats will avoid significant excavations resulting in the least possible disruption to the marsh.

Use of precast pile caps will reduce the in-situ concrete work on site. Pile caps will sit at or above existing ground level to reduce the excavation requirements on site, minimising the impacts on water quality mentioned above and maintain ecological water requirement flows through this sensitive area.

With regard to the boardwalk construction across the Avoca River, that the boardwalk deck will be installed at the same time on completion of the debris trap concrete pier by Wicklow County Council. Temporary gravel working platforms will be provided for the construction of these works and, as mentioned above, it is intended that all works within the Avoca River will be constructed during low flow and temporary gravel berms and flow diversions would be put in place to ensure a safe working platform in the riverbed to undertake the construction works. It is believed that Wicklow County Council will be responsible for these flow diversion works as well as working platform in the riverbed.

Impacts on Water Levels and Flooding

The proposed structure can adversely affect upstream and downstream water levels and flows of the waterbodies to intervene.

As mentioned above, water levels across the marsh are shallow and respond directly to rainfall, rising above ground level after rainfall events and are therefore sensitive to ground level alterations or potential leakage due to construction works.

However, volumes displaced by the proposed temporary boardwalk, bog mats and localised temporary sheet piling during construction phase are considered to be small relative to the flow volumes in the receiving waterbody and will result in a non-significative effect in terms of quantity of flow affected. The bog mats will have sufficient load-bearing capacity for the construction equipment, so no displaced volume is expected from the weight of the machinery.

There is minimal impact on flooding during the construction phase. The volumes displaced by the proposed temporary boardwalk, bog mats and localised temporary sheet piling during construction phase are extremely small relative to the flow volumes in the receiving waterbody and will result in an imperceptible effect. As mentioned above, the site compound will be located outside the marsh and therefore will not have an impact on its local hydrology.

Construction works will be carried out during spring to autumn. As such, it is not expected significant dewatering volumes surface or groundwater during the construction phase. The 1% AEP event levels scenario plus 300mm freeboard was selected as the design flood level. Furthermore, additional freeboard considered up to the bottom of the boardwalk will allow even the flow associated with the 0.1% AEP event to be conveyed. However, as the marsh is located within Flooding Zones A and B, for the 10% AEP event the bog mats and temporary gravel platforms/berms will be inundated.

As mentioned above, the water levels in the marsh are very shallow and respond rapidly to rainfall events, so recurrent flooding is to be expected during the construction phase and mitigation measures will therefore be required to alleviate the risk associated with these events.

Operational Phase

Boardwalk

The nature of the proposed development as a boardwalk means that the potential contaminant load and accidental spillage risk is minimal during operational phase.

The existing surface water drainage systems in the marsh will be maintained as part of the development. The interception of rainfall by the boardwalk will be imperceptible in terms of runoff reduction.

The proposed boardwalk would be lightly trafficked and as no application of salts and grit during ice/snow conditions will be carried out. The proposed boardwalk does not result in an increased hardstanding area. The predicted impact of pollutants discharged into the marsh or Avoca River from the proposed hardstand surfaces is considered imperceptible.

The risk of pollution to both surface and groundwater resulting from accidental spillage is considered negligible, as the boardwalk would only accommodate pedestrians and cyclists. It is not anticipated that any chemicals or hydrocarbons will ever be transported across the bridge.

Surface Water Management

In line with the recommendation of the GDSDS, SuDS and the Local Authority, it is proposed to implement SuDS measures on site. The introduction of SuDS measures including attenuation and flow control leaving the site will result in an overall decrease of the rate of surface water discharging from the entire site which currently unattenuated into the Avoca Marsh. More information is provided in Infrastructure Design Report prepared by DOBA and provided as a separate document.

Wastewater

As outlined above, the wastewater flows generated from the proposed development with be conveyed to the south with Wastewater infrastructure constructed fully coordinated with the

proposed upgrade works before discharging to the upgraded UE wastewater infrastructure and Arklow WWTP.

Uisce Éireann have advised Confirmation of Feasibility (CoF) Letter, that a connection from the proposed development to the existing combined line is feasible.

Accidental Spillages

There is a potential for leaks and spillages from vehicles along access roads and in parking areas. Any accidental emissions of oil, petrol or diesel could cause contamination if the emissions enter the water environment unmitigated.

7.6 Potential Cumulative Impacts

Approved Plans/ Projects

The site is adjacent to a recently granted 84 units scheme which was submitted by the same client as this application relates to (ABP Ref. ABP-319604-24 & Wicklow Co. Co. Ref. 23/756). The site is also adjacent to the KWETB proposed school site (Planning Ref. 22/213), which has received planning permission by Wicklow County Council.

It is not likely that the Project will result in any negative significant cumulative effects on Hydrology or Water Services in combination with these projects.

Future Plans/ Projects

This submission consists of the initial phase of a large residential development, to be provided over the coming years. The overall proposed masterplan seeks to provide c.1500 residential units, creches, local centre, the first phase of a future regional road for Arklow town, new roads connecting the site to the surrounding areas and a pedestrian / cycle path.

It is not likely that the Project will result in any negative significant cumulative effects on Water and Hydrology in combination with the future masterplan development.

Each development will require approval from Uisce Éireann (UÉ) confirming available capacity in the water and wastewater infrastructure. The surface water and foul drainage infrastructure and water supply requirements for the proposed Project has been designed to the highest standards. Irish Water have confirmed connection to its water and foul network can be facilitated subject to a connection agreement.

Each permitted development is required by the Local Authority and UÉ to comply with the Local Authority and UÉ requirements by providing suitable attenuation on-site to ensure greenfield run-off rates and ensure that there is no increase in off-site flooding as a result of the proposed Project.

Mitigation measures are required to manage sediment run-off and fuel leakages during construction and operation. All developments are required to ensure they do not have an impact on the receiving water environment in accordance with the relevant legislation (Water Framework Directive and associated legislation) such that they would be required to manage run-off and fuel leakages.

The residual cumulative impact on water and hydrology for the Construction and Operation Phases is anticipated to be long-term, neutral in terms of quality and of imperceptible significance, once appropriate mitigation measures to manage water quality run-off in compliance with legislative requirements are put in place for each development

7.7 Mitigation Measures

Construction Phase

General Measures to Safeguard Water Quality

The management of surface water during the construction phase will adhere to the recommendations of the CIRIA guides Control of Water Pollution from Construction Sites (2001) and Control of Water Pollution from Linear Construction Projects (2006).

Pollution Risk

During construction key requirements for control of chemical pollution risk will include:

- Storage – all equipment, materials and chemicals will be stored in the compound for the housing construction. Chemical, fuel and oil stores will be sited on impervious bases in the site compound and within a secured bund of 110% of the storage capacity, within the lay down area.
- The integrity and water tightness of all the bunding structures and their resistance to penetration by water or other materials stored therein shall also be tested and demonstrated.
- All fuel oil fill areas will have an appropriate spill apron.
- Vehicles and refuelling – standing machinery will have drip trays placed underneath to prevent oil and fuel leaks causing pollution. Where practicable, refuelling of vehicles and machinery will be carried out on an impermeable surface in designated areas, well away from any surface watercourse.
- Maintenance – maintenance to construction plant will not be permitted on site unless vehicles have broken down necessitating maintenance at the point of breakdown. All necessary pollution prevention measures will be put in place prior to commencement of maintenance in this instance.
- Mess, sanitation and welfare facilities will be required during construction and will be located at the construction compound. Foul effluent will make use of chemical facilities with periodic removal for offsite disposal.

No significant excavation works are foreseen. However, in the event that minor excavations are required, soil material excavated will be transferred directly to a dumper truck. The excavated material will be stored temporarily within the main temporary site compound.

Water Management

As mentioned above, water levels across the marsh are shallow and respond directly to rainfall, rising above ground level after rainfall events and are therefore sensitive to potential leakage due to construction works.

Because of this, it is proposed to establish a weather-based precautionary system for allowance to construction works on the marsh; construction works will be carried out during Spring-Autum period. Machinery works (such as drilling/piling) shall not be permitted on the marsh in the event of a heavy rainfall event. Heavy machinery works will be scheduled on a regular basis subject predicted dry conditions ahead. A cut-off point and a black/white system will be established at the entrance of the work area on the marsh to allow work to proceed.

In the event of expected heavy rainfall, all heavy machinery will be removed in advance from the marsh area and stored on the compound site. Works will only be resumed after approval of Ecological Clerk of Works (ECoW).

Extensive monitoring will be adopted to ensure that the water is of sufficient quality to discharge to the vegetated ground on the marsh. The use of additional settlement and silt traps and an oil interceptor (if required) will be adopted if the monitoring indicates the requirements for the same with no excess silt or contaminated water permitted to discharge to the marsh.

It is further noted that works will be completed between the months of April to October, during the time of year when precipitation is low and the risk of flooding is minimised.

Measures to Safeguard against the Release of Hydrocarbons

To control and contain any potential hydrocarbon and other harmful substances spillage by vehicles during construction, it is recommended where possible to refuel plant equipment off the development site, thus mitigating this potential impact by avoidance. However, given the remote nature of the Site, this is not likely to be a practical measure for all equipment.

If fuelling must occur on site, then a discrete "fuel station" will be designated for the purpose of safe fuel storage and fuel transfer to vehicles. This fuel station will be bunded to 110% volume capacity of fuels stored at the site and will be located within the site compound. The bunded area will be drained by an oil interceptor and drainage of same will be controlled by a pent stock valve that will be opened to discharge storm water from the bund. A suitably qualified management company will take responsibility for management and maintenance of the oil interceptor and associated drainage on a regular basis, including decommissioning following construction.

Despite the management of refuelling and fuel storage, there remains the risk of leakage from vehicles and plant equipment during construction activity. The plant equipment used on site will require regular mechanical checks and audits to prevent spillage of hydrocarbons on the exposed ground (during construction).

In the event of an accidental spill during the construction, contamination occurrences will be addressed immediately, this includes the cessation of works in the area of the spillage until the issue is resolved. In this regard, spill kits will be kept in each vehicle associated with the Development i.e. spill kits will be readily available to all operators. Spill kits will contain a minimum of; oil absorbent granules, oil absorbent pads, oil absorbent booms, and heavy-duty refuse bags (for collection and appropriate disposal of contaminated matter). No materials contaminated or otherwise will be left on the Site. Spill kits will also be established at proposed construction areas, for example, a spill kit will be established and mobilised as part of the sheet piled area materials and equipment. Suitable receptacles for hydrocarbon contaminated materials will also be at hand.

Once the above measures are implemented the risk of hydrocarbon contamination intercepting the surface water network will be significantly reduced, however there remains a level of risk, and therefore both precautionary measures and emergency response protocols as specified in the CEMP will be implemented on site.

Measures to Safeguard against the Release of Cement-Based Products

The piles for the boardwalk will be filled with concrete and a single 25mm steel reinforcing bar. In-situ concrete will be placed with mini concrete trucks and concrete pumps will be utilised. This pouring of concrete will be located in the immediate vicinity of the marsh. The operation and management of these activities be carefully controlled to avoid spillage which will adversely affect the chemical water composition and aquatic habitats of species. As the use of concrete cannot be avoided the following control measures will be employed:

- Placing of concrete in or near watercourses will be carried out only under the supervision of the Ecological Clerk of Works (ECoW).
- No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place.
- Where possible, pre-cast elements for culverts and concrete works will be used.
- No washing out of any plant used in concrete transport or concreting operations will be allowed on-site.
- Where concrete is delivered on site, only the chute shall be cleaned, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any drain or watercourse will be allowed. Chute cleaning water is to be tanked and removed from the site to a suitable, non-polluting, discharge location.
- Use weather forecasting to plan dry days for pouring concrete.
- Ensure pour site is free of standing water, and plastic covers will be ready in case of sudden rainfall event.
- Disposal of raw or uncured waste concrete will be controlled to ensure that watercourses or other sensitive areas will not be impacted.
- No cement will be required for works associated with horizontal directional drilling under watercourses and no cement will be stored in the vicinity of watercourses during such works.

Measures to Safeguard against the Release of Other Pollutants

All precautions will be taken to avoid spillages of diesel, oil or other polluting substances during the construction phase. The Contractor is obliged to implement the following measures to prevent contamination of watercourses:

- No refuelling of construction vehicles or plant will take place within the 50m surface water buffer zone (i.e., away from the marsh).
- Undertaking refuelling of plant, equipment and vehicles will only be undertaken on impermeable surfaces.
- No maintenance of construction vehicles or plan will take place along the proposed boardwalk, except in a case of emergency.
- All potentially hazardous chemicals, fuel, hydraulic oils and lubricants will be stored in bunded areas (in accordance with established best practice guidelines) at the Site Compound.
- In order to reduce the risk of contamination arising as a result of spills or leakages, all fuels, chemicals, liquid and solid waste will be stored on impermeable surfaces.
- If there is a requirement to store hazardous chemicals on site, they will be stored within a bunded, locked COSHH container, with upkeep and security ensured by the contractor.
- All tanks and drums are to be bunded in accordance with established best practice guidelines.
- Re-fuelling of construction equipment and the addition of hydraulic oil or lubricants to vehicles / equipment will take place in designated bunded areas within the main construction compound and not on-site where reasonably practicable. If it is not possible to bring machinery to the refuelling point, fuel will be brought to site by a 4x4 in a double skinned bowser with drip trays. The bowser/4x4 will be fully stocked with spill kits and absorbent material, with delivery personnel being fully trained to deal with any accidental spills. The bowser will be bunded appropriately for the fuel usage volume for the time period of the construction.
- The plant and machinery used will be regularly inspected for leaks and fitness for purpose.
- Spill kits will be readily available to deal with accidental spillage at all times.
- A segregated waste storage will be available at the substation construction site.

- An inventory of all chemicals on site will be kept. It will include:
    - Procedures for storage of all materials listed
    - Location details of all materials listed
    - Volume and description of all substances stored on-site
    - Waste disposal records, including copies of all Waste Transfer Notes (WTN) detailing disposal routes and waste carriers used. Where waste is being shipped abroad, a copy of the Trans Frontier Shipping (TFS) document must be obtained from Dublin City Council and kept on site along with details of the final destination and any relevant permits, licences or other relevant documentation.
    - Chemical storage details will be part of routine site audits.
    - Only where absolutely necessary should any hazardous waste be stored on site. If so, Hazardous Waste should be stored in a COSHH store. Only trained operatives should handle hazardous substances. Please note that COSHH data sheets are NOT risk assessments and all risk assessment should be carried out separately. All stored hazardous waste will be clearly labelled. All of these will be regularly inspected for visual signs of leaks or something that would impact on their capacity – e.g. where a drip tray is full of rainwater.

Measures to Safeguard against the Release of Sewerage

A self-contained port-a-loo system with an integrated waste holding tank will be used on site for toilet facilities, which will be located in the construction compound for the housing. This will be maintained by the service contractor as required and will be removed from the site on completion of the construction phase.

Measures to Safeguard against Impacts during Piling Works

In order to avoid the potential for adverse impacts to instream and marsh and in-stream habitats during the construction phase the method of piling to be implemented will be based on non-invasive techniques, ensured by the use of bog mats and lighter vehicles. This coupled with the set-back distances of the pile locations from the Avoca river, as well as the presence of the bedrock and overburden between the river and the pile locations at piers and abutments, will ensure that no noise or vibration associated with the piling will have the potential to cause injury to the local species (i.e. will not exceed the low guide value of the 183 dB within adjacent waters) within the river channel adjacent to the piling locations.

In addition, the timing of all piling works will be timed to occur outside the spawning season in the Avoca River. The use of non-invasive piling will also ensure that vibration levels associated with this piling will be low and will not present a risk of undermining the integrity of the marsh, Avoca riverbanks and their collapse.

With the implementation of the above measures, it is concluded that the piling works during the construction phase will not result in adverse effects to Annex 2 fish species, or species dependant on the hydrological and hydrogeological local environment associated with Avoca River and the marsh.

Operational Phase

The nature of the proposed development as a boardwalk means that the potential contaminant load and accidental spillage risk is minimal during operational phase.

The existing surface water drainage systems in the marsh will be maintained as part of the development.

The proposed scheme will incorporate the application of SuDS best practice and GDSDS when designing the surface water drainage network for the site.

Foul drainage for the proposed Project will be in accordance with the relevant standards for design and construction as detailed in the Infrastructure Design Report.

7.8 Predicted Impacts

Construction Phase

Following the implementation of mitigation measures detailed in Section 8.7.1, the predicted impact on the Water environment during the Construction Phase (in accordance with EPA Draft Guidelines) is considered to be likely, neutral, imperceptible, and short-term. This is due to the control and mitigation measures highlighted in Section 7.7 above.

Operational Phase

Following implementation of the mitigation measures proposed in Section 7.7, the predicted impact on the surface water environment once the development is constructed and operational (in accordance with EPA Draft Guidelines) is considered to be likely, neutral, imperceptible, and long-term. This is due to the mitigation measures highlighted in Section 7.7. Overall, the attenuation proposed for the development and installation of interceptors will improve flood management and water quality.

7.9 'Do Nothing' Scenario

If the proposed development was not to go ahead (i.e. in a Do-Nothing scenario) the baseline environment in terms of hydrology and hydrogeology would remain unchanged as there would be no excavations or construction. Therefore, in a "Do Nothing" scenario, there would be a neutral effect on the hydrological and hydrogeological environment at the site. The likelihood in a temporary and short-term basis is the existing natural state of the area would persist, without any alterations or disturbances caused by the development.

However, there are a number of existing permitted developments in the vicinity of the proposed development.

It is likely that in the absence of the proposed development, that a development of a similar nature would be progressed on the site that accords with national and regional policies and therefore the likely significant effects would be similar to this proposal.

7.10 Worst Case Scenario

The "worst-case" scenario is the accidental release of diesel fuel or spillage of other similar hazardous materials occurring on site during the Construction phase, through the failure of secondary containment or a materials handling accident on the site. If this were to occur in an open excavation it could lead to these materials running off through local marsh environment end eventually into the Avoca Estuary, which is an adverse, significant and temporary effect. Appropriate remediation measures would then be required depending on the nature and extent of any contamination caused under such a scenario and may include the associated in-situ remediation techniques.

The proposed boardwalk is located across the Arklow Town Marsh pNHA located north of the Avoca Estuary Transitional Waterbody which is subject to fluvial and coastal flooding. Therefore, there is a 'direct' hydrological linkage between the proposed development and these receptors. As mentioned above, water levels across the marsh are shallow and respond directly to rainfall, rising above ground level after rainfall events and are therefore sensitive to ground level alterations or potential leakage due to construction works.

The contractor must adhere to the CEMP to ensure that all containment is kept in working order to avoid this scenario occurring. Construction works will be carried out during spring to autumn.

7.11 Monitoring & Reinstatement

The Contractor shall implement pre-treatment and silt reduction measures on site and shall include a combination of silt fencing, settlement measures (silt traps, silt sacks and settlement tanks) and hydrocarbon interceptors (as outlined in the Construction Environmental Management Plan). Qualitative and quantitative monitoring shall be implemented, with the client's Environmental Consultant auditing the Contractor's regular sampling and analysis results.

7.12 Difficulties in Compiling Information

There were no difficulties in compiling the information.

7.13 References

DOBA (2025). Greenway Boardwalk: Outline Construction Methodology.

DOBA (2025). Infrastructure Design Report (LRD Application Submission). Lands at Kilbride, Arklow, Co. Wicklow (DOBA, 2025).

DOBA (2025). Site Specific Flood Risk Assessment (Section 32B Submission).

Environmental Protection Agency (EPA) (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.

National Roads Authority (NRA) (2009). Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

8. Noise and Vibration

8.1 Introduction

This section of the EIAR has been prepared by Traynor Environmental Ltd to identify and assess the potential noise and vibration impacts associated with the proposed development of lands for mixed use development at Kilbride, Arklow. Co. Wicklow during both the construction/demolition and operational phases of the development.

This chapter includes:

- A description of the receiving ambient noise climate in the vicinity of the subject site.
- An assessment of the potential noise and vibration impact associated with the proposed development during
    - The short-term construction/demolition phases and
    - The long-term operational phase on its surrounding environment.
- The assessment of direct, indirect and cumulative noise and vibration impacts on the surrounding environment have been considered as part of the assessment.

Mitigation measures are included, where relevant, to ensure the proposed development is constructed and operated in an environmentally sustainable manner to ensure minimal impact on the receiving environment.

Proposed Development Site Location and Brief Description

This is as described in chapters 1 (introduction) and 3 (Description of Development) of this EIAR and as set out in the statutory notices.

Statement of Competence

In accordance with Article 5(3)(a) of the EU Directive, by appointing Traynor Environmental, the applicant has ensured that this chapter has been prepared by "Competent experts". In accordance with Environmental Protection Agency (EPA) guidance "All competent persons must possess a combination of technical knowledge, experience and skills, and must be able to demonstrate both practical and theoretical competence and should participate in continual professional development. Competence may be demonstrated through reference to an appropriate qualification and/or professional membership of a recognised acoustic organisation (e.g. the Institute of Acoustics) and/or appropriate experience". The monitoring and analysis of the data was conducted by Nevin Traynor of Traynor Environmental deemed to be a "competent person" as per criteria outlined by the EPA. The monitoring programme, data and report was carried out by Nevin Traynor who is certified as been competent in Environmental Noise Measurement by the Institute of Acoustics (IOA) with over 20 years' experience in Environmental and Acoustic Consultancy.

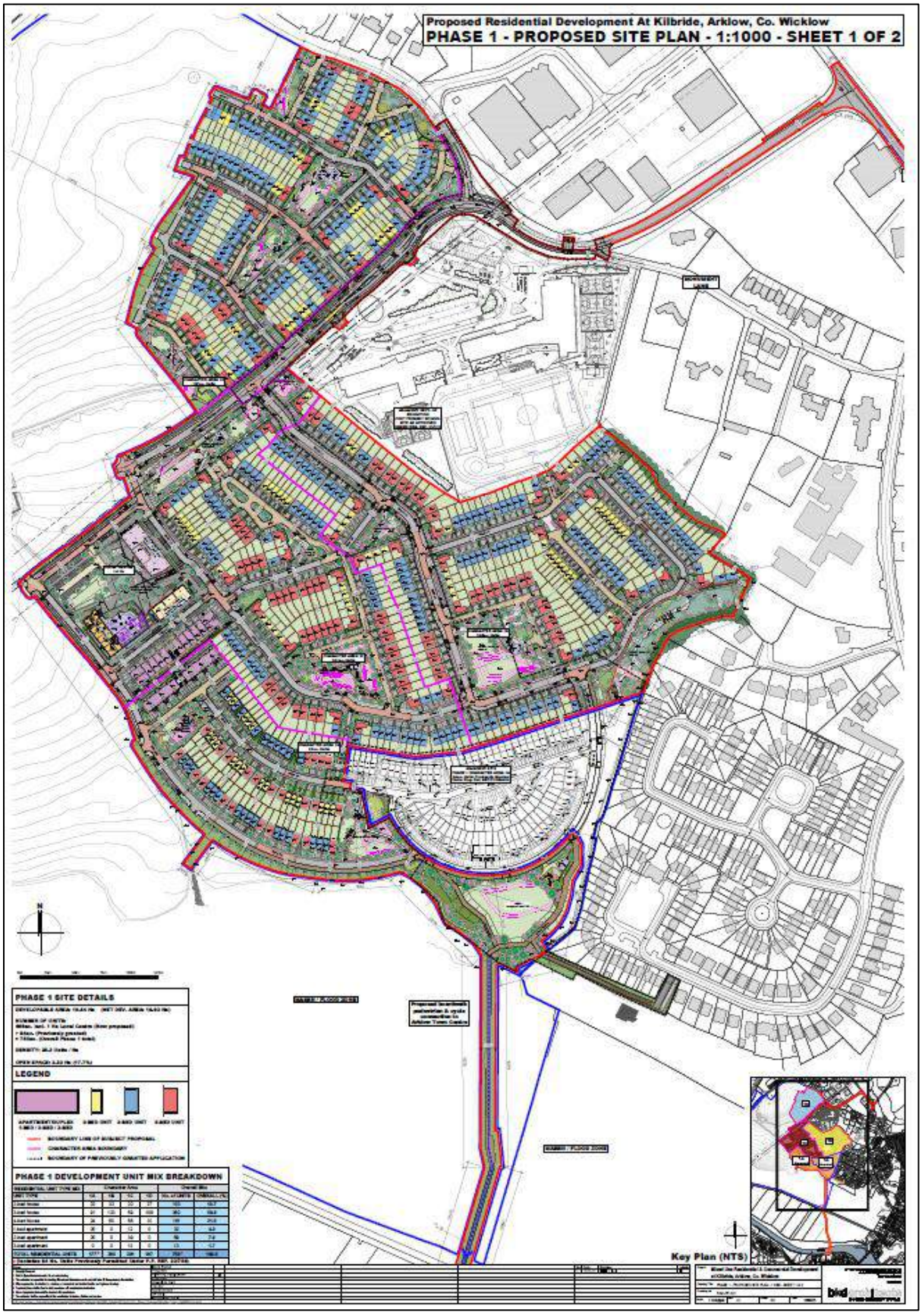


Figure 8.1: Proposed Site Layout

8.2 Assessment Methodology

The study has been undertaken using the following methodology:

- A review of the most applicable standards and guidelines has been conducted in order to set a range of acceptable noise and vibration criteria for the construction/demolition and operational phases of the proposed development; this is summarised in the following sections.
- Predictive calculations have been performed to estimate the likely noise emissions during the construction/demolition phase of the project at the nearest sensitive locations (NSL) to the site.
- Predictive calculations have been performed to assess the potential impacts associated with the operation of the development at the most sensitive locations surrounding the development site; and,
- A schedule of mitigation measures has been proposed, where relevant, to control the noise and vibration emissions associated with both the construction/demolition and operational phases of the proposed development.

Desktop Research – Principal Data Sources

This assessment meets the requirements for an EIAR, as outlined in the relevant National and EU legislation, and has been prepared in accordance with guidance documents.

- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Part 1 – Noise.
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Part 2 -Vibration.
- BS 7385-2:1993 *Guide for measurement of vibrations and evaluation of their effects on buildings*.
- *BS 4142: 2014: Methods for Rating and Assessing Industrial and Commercial Sound.*
- BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings.
- BS 6841 (1987): Measurement and evaluation of human exposure to whole-body mechanical vibration and repeated shock.
- *ISO 1996: 2017: Acoustics - Description, Measurement and Assessment of Environmental Noise.*
- Wicklow County Council Noise Action Plan 2024 – 2028.
- ProPG: Planning & Noise.
- European Commission Guidance on the preparation of the Environmental Impact Assessment Report
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018)
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (May 2022).

The study has been undertaken using the following methodology:

- Baseline Noise monitoring and an Environmental Noise Survey has been undertaken across the development area to determine the range of noise levels at varying locations across the site.
    - The equipment used was a Larson Davis Sound Expert LxT and a Larson Davis Expert 831.
    - The Baseline monitoring period was carried out between the 24th of March and 26th of March 2025, at Locations A-C.
    - The Environmental Noise Survey monitoring period was carried out at five noise sensitive locations around the proposed development on the 23rd of March 2025.

- A review of the most applicable standards and guidelines has been conducted in order to set a range of acceptable noise and vibration criteria for the construction/demolition and operational phases of the proposed development; this is summarised in the following sections.
- Predictive calculations have been performed to estimate the likely noise emissions during the construction/demolition phase of the project at the nearest sensitive locations (NSL) to the site.
- Predictive calculations have been performed to assess the potential impacts associated with the operation of the development at the most sensitive locations surrounding the development site; and,
- A schedule of mitigation measures has been proposed, where relevant, to control the noise and vibration emissions associated with both the construction/demolition and operational phases of the proposed development.

Construction/Demolition Phase – Noise Assessment Criteria

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction/demolition phase of a project. Wicklow County Council (WCC) typically controls construction activities by imposing limits on the hours of operation and consider noise limits at their discretion.

In order to set appropriate construction noise limits for the development site, reference has been made to *BS 5228 -1:2009 +A1 2014 Code of practice for noise and vibration control on construction and open sites- Noise*. Part 1 of this document Noise provides guidance on selecting appropriate noise criteria relating to construction works.

BS 5228-1:2009+A 1:2014 gives several examples of acceptable limits of construction and demolition noise, the most simplistic being based on upon the exceedance of fixed noise limits. For example, paragraph E.2 states:

'Noise from construction and demolition sites should not exceed the level at which conversation in the nearest building would be difficult with windows shut.'

Paragraph E.2 goes on to state:

'Noise levels, between 07:00 and 19:00 hours; outside the nearest window of the occupied room closest to the site boundary should not exceed:

70 decibels (dBA) in rural, suburban areas away from the main road traffic and industrial noise.
75 decibels (dBA) in urban areas near main roads in heavy industrial areas.'

Note that a typical planning condition in relation to construction noise issued by Local Authorities refer also to the compliance with BS 5228 part 1 as a means of controlling impacts to the surrounding environment. BS 5228 has therefore been used to inform the assessment approach for construction noise in line with Local Authorities requirements.

For this development it is considered appropriate to adopt the 65dB(A) during daytime. The construction noise limits, which are presented in Table 8.1 represent a reasonable compromise between the practical limitations in a construction project, and the need to ensure an acceptable noise level for the nearby residents and their sensitive receptors including amenity space. Table 8.1 specifies the recommended Project Noise Limit Criteria in accordance NRA Maximum Permissible Construction Phase Noise Levels at the Façade of Dwellings during road developments.

Construction Phase Noise Limit Criteria		
Days & Times	**L_{Aeq}, (1hr) dB**	**$L_{pA(max)}$ slow dB**
Monday to Friday - 07:00 to 19:00	**70**	**80**
Monday to Friday - 19:00 to 22:00	**60**	**65**
Saturday - 08:00 to 16:30	**65**	**75**
Sundays and Bank Holidays - 08:00 to 16:30	**60**	**65**

Table 8.1: NRA Maximum Permissible Construction Phase Noise Levels at the Façade of Dwellings during Road Developments.

Note 1: Construction activity at these times, other than that required in respect of emergency works, will normally require the explicit permission of the relevant local authority. For the appropriate assessment period (i.e., daytime in this instance) the ambient noise level is determined. If the construction noise exceeds, then a significant effect is deemed to occur.

Construction/Demolition Phase – Vibration Assessment Criteria

Guidance relevant to acceptable vibration in order to avoid damage to buildings is contained within *BS 7385-2 (1993*). The guidance values contained within *BS 7385* are reproduced also in *British Standard BS 5228-2 (2009).*

These standards differentiate between transient and continuous vibration. Surface construction activities are considered to be transient in nature as they occur for a limited period of time at a given location. The standards note that the risk of cosmetic damage to residential buildings starts at a Peak Particle Velocity (PPV) of 15mm/s at 4Hz. The standard also notes that below 12.5mm/s PPV the risk of damage tends to zero. Both standards note that important buildings that are difficult to repair might require special consideration on a case-by-case basis but building of historical importance should not (unless it is structurally unsound) be assumed to be more sensitive. If a building is in a very unstable

state, then it will tend to be more vulnerable to the possibility of damage arising from vibration or any other ground borne disturbance.

Table 8.2 below summarises the proposed vibration criteria below which there is no risk of damage to buildings. These limits apply to vibration frequencies below 15Hz where the most conservative limits are required. If there are any protected buildings near the works, there is a greater potential for these to be more vulnerable than other adjacent modern structures. Therefore, on a precautionary basis, the guidance values for structurally sound buildings are reduced by 50% in line with the guidance documents referred to above.

Category of Building	Threshold of potential significant effect (Peak Particle Velocity - PPV - at building foundation) for Transient Vibration
Structurally sound and non-protected buildings	12 mm/s
Protected and / or potentially vulnerable buildings	6 mm/s

Table 8.2: Transient Vibration Impact Criteria for Buildings (Conservative Criteria below which there is No Risk of Cosmetic Damage). Source: "Guidelines for the Treatment of Noise & Vibration in National Road Schemes," NRA, 2004

Building Response

As previously mentioned in table 8.2 the standard notes that below 12 mm/s PPV the risk of damage tends to zero. It is therefore common, on a cautious basis to use this lower value. Taking this into consideration the vibration criteria in Table 8.3 is recommended.

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of:		
Less than 15Hz	15 to 40Hz	40Hz and above
12 mm/s	20 mm/s	50 mm/s

Table 8.3: Recommended Vibration Criteria During Construction/Demolition Phase

Expected vibration levels from the construction works will be discussed further in *Section* 8.5.

Human Perception

It is acknowledged that humans are sensitive to vibration stimuli and that perception of vibration at high magnitudes may lead to concern. Vibration typically becomes perceptible at around 0.15 to 0.3 mm/s and may become disturbing or annoying at higher magnitudes. However, higher levels of vibration are typically tolerated for single events or events of short-term duration, particularly during construction projects and when the origin of vibration is known. For example, piling can typically be tolerated at vibration levels up to 6 mm/s respectively if adequate public relations are in place. These values refer to the day and evening time periods only.

Operational Phase -Noise Assessment Criteria

The operational phase of the development has been assessed with regard to Wicklow County Council in their role as designated Action Planning Authorities under Article 7 of the Environmental Noise

Regulations 2006, Statutory Instrument Number 140 of 2006 (the Regulations). The Action Plan is aimed at managing Environmental Noise and excludes noise from domestic activities, noise created by neighbours, noise at workplaces or construction noise as these can be dealt with under existing legislation such as the Environmental Protection Agency Act 1992 and Health & Safety legislation.

Mechanical Plant

Due consideration must be given to the nature of the primary noise sources when setting criteria. Criteria for noise from these sources, with the exception of additional vehicular traffic on public roads, will be set in terms of the $L_{Aeq,T}$ parameter (the equivalent continuous sound level). In relation to day-to-day Operational Phase noise impacts on off-site residential locations Wicklow County Council would typically apply the following condition to a development of this nature:

Noise levels from the proposed development shall not be so loud, so continuous, so repeated, of such duration or pitch or occurring at such times as to give reasonable cause for annoyance to a person in any premises in the neighbourhood or to a person lawfully using any public place. In particular, the rated noise levels from the proposed development shall not constitute reasonable grounds for complaint as provided for in B.S. 4142. Method for rating industrial noise affecting mixed residential and industrial areas.

Reason: In order to ensure a satisfactory standard of development, in the interests of residential amenity.

This wording is most relevant to the noise emissions from mechanical plant serving the development and careful consideration will be given to this issue as part of the detailed assessment.

Guidance from WCC on noise emissions from mechanical plant items typically makes reference to the *British Standard BS 4142: 2014: Methods for Rating and Assessing Industrial and Commercial Sound.* This guidance is the industry standard method for analysing building services plant noise emissions to residential receptors and is the document typically used by WCC in their standard planning conditions and also in complaint investigations.

BS 4142 describes methods for rating and assessing sound of an industrial and / or commercial nature. The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

For an appropriate *BS 4142* assessment it is necessary to compare the measured external background noise level (i.e., the $L_{A90,T}$ level measured in the absence of plant items) to the rating level ($L_{Ar,T}$) of the various plant items, when operational. Where noise_emissions are found to be tonal, impulsive in nature or irregular enough to attract attention, *BS 4142* also advises that a penalty be applied to the specific level to arrive at the rating level.

The subjective method for applying a penalty for tonal noise characteristics outlined in *BS 4142* recommends the application of a 2dB penalty for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible, and 6dB where it is highly perceptible.

The following definitions as discussed in BS 4142 as summarised in Table 8.4 below:

Noise	Description
ambient noise level, LAeq,T	is the noise level produced by all sources including the sources of concern, i.e., the residual noise level plus the specific noise of mechanical plant, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T]
residual noise level, LAeq,T	is the noise level produced by all sources excluding the sources of concern, i.e., the ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T]
specific noise level, LAeq, T	is the sound level associated with the sources of concern, i.e. noise emissions solely from the mechanical plant, in terms of the equivalent continuous A-weighted sound pressure level over the reference time interval [T]
rating level, LAr,T	is the specific sound level plus any adjustments for the characteristic features of the sound (e.g., tonal, impulsive, or irregular components)
background noise level, LA_{90},T	is the sound pressure level of the residual noise that is exceeded for 90% of the time period T

Table 8.4: Tonal Noise Characteristics

If the rated plant noise level is +10dB or more above the pre-existing background noise level, then this indicates that complaints are likely to occur and that there will be a significant adverse impact. A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context. The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.

Traffic Noise

Given that traffic to and from the development will make use of existing roads already carrying traffic volumes, it is appropriate to consider the increase in traffic noise level that arises as a result of vehicular movements associated with the development.

In order to assist with the interpretation of the noise associated with vehicular traffic on public roads, Table 8.5 offers guidance as to the likely impact associated with any particular change in traffic noise level (Source DMRB, 2011). It shows that small changes in noise levels are not normally noticeable, whereas an increase of 10dB would be described as a doubling of loudness. In summary the assessment looks at the impact with and without development at the nearest noise sensitive locations.

Change in Sound Level (dB)	Subjection Reaction	Magnitude of Impact	EPA Glossary of Effects[1]
0	None	No Change	Neutral
0.1 - 2.9	Imperceptible	Negligible	Imperceptible
3-4.9	Perceptible	Minor	Slight
5 - 9.9	Up to a doubling of loudness	Moderate	Moderate
10+	Over a doubling of loudness	Major	Significant

Table 8.5: Significance in Change of Noise Level

1EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports

Inward Noise Impact

The Professional Guidance on Planning & Noise (ProPG) report was published in May 2017. This guidance was prepared by a working group comprising members of the Association of Noise Consultants (ANC), the Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH). Although not a government document, since its adoption it has been generally considered as a best practice guidance and has been widely adopted in the absence of equivalent Irish guidance.

The ProPG outlines a systematic risk based 2 Stage approach for evaluating noise exposure on prospective sites for residential development. The two primary stages of the approach can be summarised as follows:

Stage 1 - Comprises a high-level initial noise risk assessment of the proposed site considering either measured and or predicted noise levels; and

Stage 2 - Involves a full detailed appraisal of the proposed development covering four '*key elements*' that include:

- **Element 1** - Good Acoustic Design Process.
- **Element 2** - Noise Level Guidelines.
- **Element 3** - External Amenity Area Noise Assessment; and
- **Element 4** - Other Relevant Issues.

The initial noise risk assessment is intended to provide an early indication of any acoustic issues that may be encountered. It calls for the categorisation of the Site as a *negligible, low, medium, or high risk* based on the pre-existing noise environment. Figure 8.2 presents the basis of the initial noise risk assessment; it provides appropriate risk categories for a range of continuous noise levels either measured and / or predicted onsite.

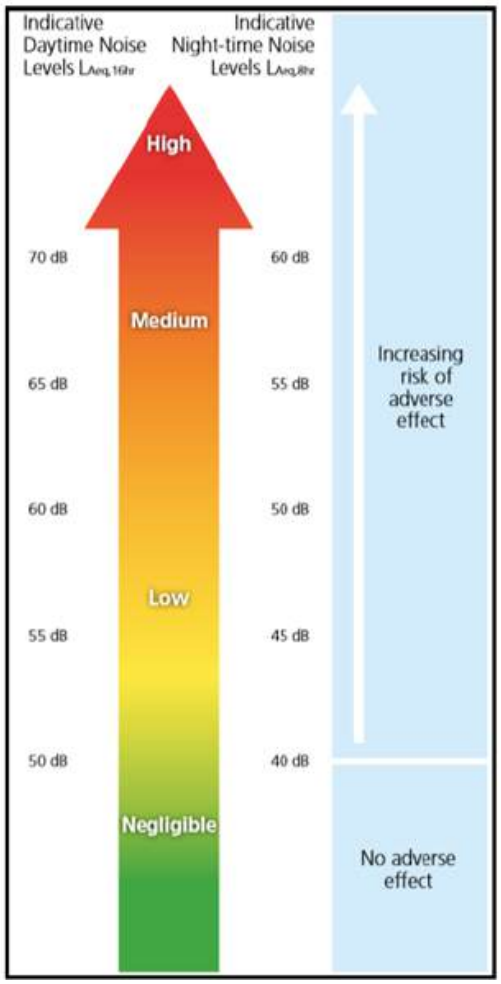


Figure 8.2: ProPG Stage 1- Initial Noise Risk Assessment

A site should not be considered a negligible risk if more than 10 L_{AFmax} events exceed 60dB during the night period and the site should be considered a high risk if the L_{AFmax} events exceed 80dB more than 20 times a night. *Element 2* of the ProPG document sets out recommended internal noise targets derived from *BS 8233 (2014).* The recommended indoor ambient noise levels are set out in Table 8.5 below and are based on annual average data, which is to say they omit occasional events where higher intermittent noisy events may occur.

Activity	Location	(07:00 to 23:00)	(23:00 to 07:00)
Resting	Living room	35 dB $L_{Aeq,16hr}$	-
Dining	Dining room / area	40 dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$ 45 dB $L_{Amax,T*}$

Table 8.6: ProPG Internal Noise Levels

**Note The document comments that the internal LAFmax, T noise level may be exceeded no more than 10 times per night without a significant impact occurring.*

In addition to these absolute internal noise levels ProPG provides guidance on flexibility of these internal noise level targets. For instance, in cases where the development is considered necessary or

desirable, and noise levels exceed the external noise guidelines, then a relaxation of the internal L_{Aeq} values by up to 5dB can still provide reasonable internal conditions.

The ProPG guidance provides the following advice with regards to external noise levels for amenity areas in the development:

'The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed, and noise levels should ideally not be above the range 50-55dB LAeq,16hr.'

Operational Phase – Vibration Assessment Criteria

Taking into account the proposed development under consideration here, there are no vibration sources associated with the operational phase. Operational criteria relating to this issue are therefore not included.

Monitoring, Surveys etc

Baseline Noise monitoring and an Environmental Noise Survey has been undertaken across the development area to determine the range of noise levels at varying locations across the site. The equipment used was two Larson Davis Sound Expert LxT and a Larson Davis Expert 831.

The Baseline monitoring periods were from 24th March up to and including 26th March 2025

at Location A, B & C. The Environmental Noise Survey monitoring period was carried out at six noise sensitive locations around the proposed development on 23rd March 2025 between 09:00hrs to 18:30hrs.

Noise Monitoring Equipment

The equipment used during the baseline noise and environmental noise survey was installed and removed by Traynor Environmental. The noise measurements were carried out using the following equipment mentioned in Table 8.7 below. The instruments were checked and calibrated before and after the survey with no significant drift noted.

Instrumentation Details		
Manufacturer	**Instrument**	**Calibrated by**
Larson Davis Sound Expert LxT	(Serial No.5595)	Environmental Measurements, Unit 12, Tallaght Business Park, Dublin 24
Larson Davis Sound Expert 831	(Serial No.3913)	Environmental Measurements, Unit 12, Tallaght Business Park, Dublin 24
Larson Davis Sound Expert LxT	(Serial No.5901)	Environmental Measurements, Unit 12, Tallaght Business Park, Dublin 24

Table 8.7: Instrumentation Details Noise Monitoring Locations

Measurement Parameters

The noise survey results are presented in terms of the following parameters:

L_{Aeq} This is the equivalent continuous sound level. It is an average and is used to describe a fluctuating noise in terms of a single noise level over the sample period. The closer the Laeq value is to either the L_{A10} or L_{A90} value indicates the relative impact of the intermittent sources and their contribution. The relative spread between the values determines the impact of intermittent sources such as traffic on the background.

L_{A90} This is the sound that is exceeded for 90% of the sample period. It is typically used as a descriptor for traffic noise.

L_{A10} This is the sound that is exceeded for 10% of the sample period. It is typically used as a descriptor for traffic noise.

L_{AFMIN} is the instantaneous minimum sound level measured during the sample period using the 'F' time weighting.

L_{AFmax} is the instantaneous maximum sound level measured during the sample period using the 'F' time weighting.

The *"A:'* suffix denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to $2x10^{-5}$ Pa.

Meteorological Conditions

The weather during the baseline noise survey was showery and overcast with windspeeds at 8 mph and daytime temperature of 10˚C. (Weather information from Met Éireann Oak Park weather station).

The weather during the environmental noise survey was showery and overcast with windspeeds at 8 mph (3 Beaufort) and daytime temperature of 10˚C. (Weather information from Met Éireann Oak Park weather station).

Definition of Study area

Attended noise measurements was conducted at six noise sensitive locations around the proposed development. An unattended noise survey was conducted at 3 locations on the proposed site. The study area for the purposes of this chapter is shown in Figure 8.1.

8.3 Receiving Environment

The proposed mixed use Large scale Residential Development will result in the demolition of an existing dwelling and 2 no. sheds/outbuildings and the construction of 666 no. residential units with a mix of semidetached and terraced houses along with duplex apartments and apartments. These will comprise 1, 2, 3 and 4 bed units. All residential units will have associated private open space facing north/ south/ east/ west. The proposal will also deliver a local centre containing 3 no. retail units, 3 no. community/ medical units and 1 no. creche unit. A new pedestrian/ cyclist link is provided via a new boardwalk and bridge across the marsh and over the Avoca River adjoining the existing greenway

and the Main Street. A new road providing vehicular access is also proposed connecting to the north to Kilbride Road along with road improvements in the surrounding area. The development will also provide for landscaping, public open spaces and all associated site development works to enable the development including boundary treatments, attenuation storage area and other service provision including ESB works.

When considering a development of this nature, the potential noise and vibration impact on the surroundings is considered for each of two distinct stages:

- Construction/Demolition Phase.
- Operational Phase

The construction/demolition phase will involve demolition of existing buildings, retaining existing walls, excavation movement over the development site, landscaping, construction of internal roads, excavation of foundations, building and transport of materials to site using the local road network. Construction of the boardwalk. Buildings shall be demolished by approved methods and in a manner that reduces the impact on ambient noise levels. This phase will generate the highest potential noise impact due to the works involved; however, the time frame is short term in nature.

The proposed Development has been designed to minimise cut and fill. Excavated material will be reused on site.

The primary sources of outward noise in the operational context are deemed to be long term in duration and will comprise traffic movements to site using the existing road network. (These issues are discussed in detail in the following sections).

8.4 Baseline Description

The Phase 1 Kilbride lands are located in Kilbride townland, Kilbride Civil Parish, and Barony of Arklow, in Co. Wicklow. Related development proposals also incorporate part of Tiknock townland to the east, and Marsh townland to the south, the majority of the latter townland corresponding with Arklow Town Marsh.

The lands are to the north of the Avoca River, bordering the Town Marsh, and are accessible from the Kilbride Road L-6179 on the northern boundary, opposite the Arklow Business Enterprise Centre and Kilbride Industrial Estate. To the east, the lands are bordered by existing housing at Avondale Crescent / Murell Drive and St. Joseph's School. The M11 Arklow Bypass lies to the west, bordering a larger land area at the Kilbride lands forming part of an Action Area Plan (AAP3) identified in the Arklow and Environs Local Area Plan 2018-2024 that will also be subject to development. Utilised as tillage land, the topography generally follows a sloping trend from higher ground at the north and north-west, falling in a south and southeast direction towards the Town Marsh and the Avoca River. Views are extensive in this direction, across Arklow town and to the coastline. A Review of the EPA Noise Maps online show the site is not a high-risk site in terms of inward noise from outside sources. At the nearest part of the site to the M11 the Daytime is modelled at 55-59dB L_{den} and for night 45-49 dB L_{night}.

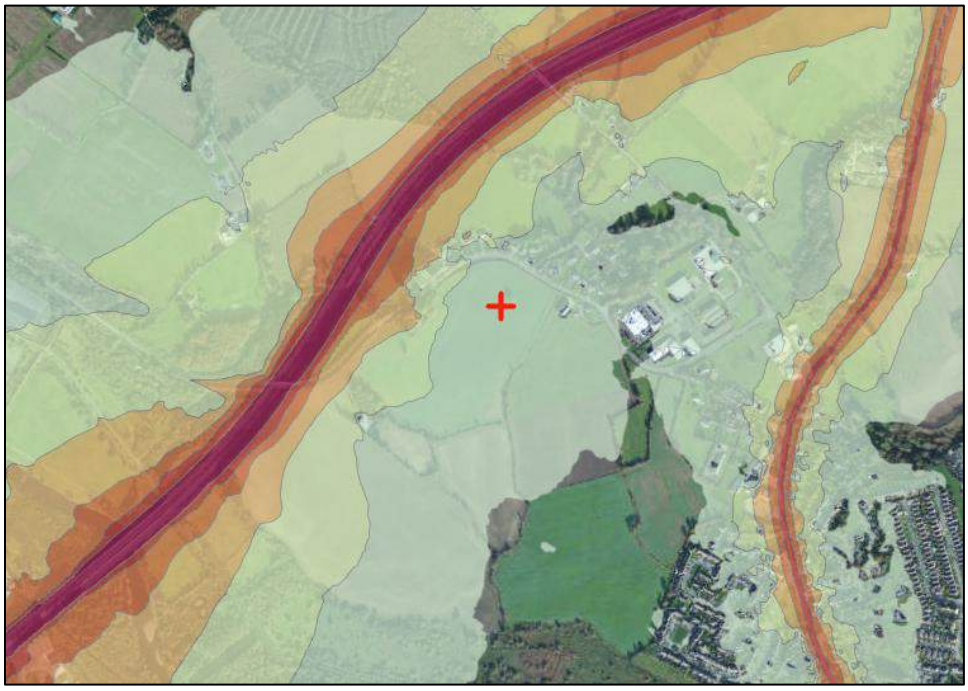


Figure 8.3: EPA Noise Mapping Showing the Lden 45- 49dB (Noise Round 4 Road National – Night)

Figure 8.4: EPA Noise Mapping Showing the Lden 55- 59dB (Noise Round 4 Road National – Daytime)

Baseline Noise Survey

A baseline noise survey has been conducted at the site in order to quantify the existing noise environment. The survey was conducted in general accordance with *ISO 1996: 2017: Acoustics - Description, Measurement and Assessment of Environmental Noise*. Specific details are set out below. Three measurement locations were selected as shown in Figure 8.3 below and described below.

Location A - located on the North west boundary.

Location B - located in the centre of the site.

Location C - located on the East boundary.

Figure 8.5: Baseline nose monitoring locations.

Survey Periods

Survey Periods

Baseline noise survey measurements were conducted at Locations A – C over the following survey periods:

Location	Period	
	Start Time/Date	End Time/Date
A	07:00hrs on 24/03/25	11:00hrs on 26/03/25
B	07:00hrs on 24/03/25	11:00hrs on 26/03/25
C	07:00hrs on 24/03/25	11:00hrs on 26/03/25

Table 8.8: Baseline survey dates and times

Survey Results and Discussion

Location A

Date	L_{Aeq}	L_{AFmax}	$L_{AF10.00}$	$L_{AF90.00}$
24/03/2025	39	46	41	30
25/03/2025	41	46	43	32
Average	**40**	**46**	**42**	**31**

Table 8.9: Location A: Average Night time Noise

Date	L_{Aeq}	L_{AFmax}	$L_{AF10.00}$	$L_{AF90.00}$
24/03/2025	54	77	43	35

25/03/2025	53	74	41	37
Average	**54**	**76**	**42**	**36**

Table 8.10: Location A: Average Day time Noise

The noise environment at the measurement location A was dominated by intensive short duration noise events which are characteristic of road traffic noise from the M11 and local roads. Daytime noise levels measured at 54 dB(A) L_{Aeq} and background noise levels measured 36 dB(A) L_{A90}. Nighttime noise levels were measured at 40 dB(A) L_{Aeq} and the measured background noise level was 31 dB(A) L_{A90}.

Location B

Date	L_{Aeq}	L_{AFmax}	$L_{AF10.00}$	$L_{AF90.00}$
24/03/2025	34	45	35	32
25/03/2025	33	44	36	31
Average	**34**	**45**	**36**	**32**

Table 8.11: Location B: Average Night time Noise

Date	L_{Aeq}	L_{AFmax}	$L_{AF10.00}$	$L_{AF90.00}$
24/03/2025	39	49	40	37
25/03/2025	40	47	41	38
Average	**40**	**48**	**41**	**38**

Table 8.12: Location B: Average Day time Noise

The noise environment at the measurement location B indicates that the measured noise was dominated by intensive short duration noise events which are characteristic of road traffic noise from the M11, and St. Josephs N.S. Daytime noise measured at 40 dB(A) L_{Aeq} and background noise levels measured 38 dB(A) L_{A90}. Night-time measured at 34 dB(A) L_{Aeq} and the measured background noise level was 32 dB(A) L_{A90}.

Location C

Date	L_{Aeq}	L_{AFmax}	$L_{AF10.00}$	$L_{AF90.00}$
24/03/2025	48	57	45	42
25/03/2025	46	54	43	41
Average	**47**	**56**	**44**	**42**

Table 8.13: Location C: Average Night time Noise

Date	L_{Aeq}	L_{AFmax}	$L_{AF10.00}$	$L_{AF90.00}$
24/03/2025	55	72	56	39
25/03/2025	53	70	51	36
Average	**54**	**71**	**54**	**38**

Table 8.14: Location C: Average Day time Noise

The noise environment at the measurement location C indicate that the measured noise was dominated by intensive short duration noise events which are characteristic of road traffic noise from the neighbouring housing estate and St. Josephs N.S. Daytime noise measured at 54 dB(A) L_{Aeq} and background noise levels measured 38 dB(A) L_{A90}. Night-time measured at 47 dB(A) L_{Aeq} and the measured background noise level was 42 dB(A) L_{A90}.

Discussion and conclusions

Location A, B and C all indicate that the dominate intensive short duration noise events are characteristic of road traffic noise from the M11 and neighbouring roads. The baseline noise environment will not require additional constraints to be imposed on the majority of the proposed project outside of the normal criteria applicable to a development of the scale and nature of that proposed.

Environmental Noise Survey

An environmental noise survey has been conducted at the site in order to quantify the existing noise environment. The survey was conducted in general accordance with ISO 1996: 2017: *Acoustics - Description, Measurement and Assessment of Environmental Noise*. Specific details are set out below. Six measurement locations were selected as shown in Figure 8.6 and described in Table 8.15 below.

Noise Measurement Location	Description
Location NM1	Located behind residential housing, North of the proposed site.
Location NM2	Location at the West of Kilbride Industrial Estate, Northeast of the proposed site.
Location NM3	Located at Carrigmor Rd beside residential housing alongside R772, East of the proposed site.
Location NM4	Location at Marshlands Youth and Sports Centre inside Avondale Cres housing estate, Southeast of the proposed site.
Location NM5	Located behind Pyramid Self Storage and beside M11 motorway, Northwest of proposed site.
Location NM6	Located South of the site in marsh area.

Table 8.15: Description of Noise Measurement Location

Figure 8.6: Noise Monitoring Locations (Image Source: Google Maps)

**NM: Noise measurement, NSL: Noise Sensitive Location*

Survey Periods

The noise survey was carried out at six locations over the following period:

08:00hrs to 18:00hrs on 23rd March 2025.

For the purpose of this assessment, daytime is taken to be between 08:00 and 18:00. The weather during the daytime survey period was showery and overcast with windspeeds at 9 mph and daytime temperature of 12°C. (Weather information from Met Éireann synoptic Casement weather station).

Survey Results and Discussion

The noise survey results for the six monitoring locations are summarised in Tables 8.16 – 8.20 below.

Location NM1

Time		Measured Noise Levels (dB re. $2x10^{-5}$Pa)				
		LA_{max}	LA_{min}	LA_{10}	LA_{90}	L_{Aeq}
Day	08:00	72	59	65	58	64
	11:30	69	58	63	57	62
	15:00	70	59	64	59	64

Table 8.16: Measured Noise Levels at NM1

The dominant noise source at this location was traffic on the M11 motorway and local roads. Background noise from the M11 was also significant noise source at this location. Other minor noise sources include activities from the nearby houses to the east and south. The L_{Aeq} ranged from 62 to 64 dB. The L_{A90} ranged from 57 to 59 dB. The variation in L_{Aeq} can be attributed to the traffic on the roads near the measurement location.

Location NM2

Time		Measured Noise Levels (dB re. $2x10^{-5}$Pa)				
		LA_{max}	LA_{min}	LA_{10}	LA_{90}	L_{Aeq}
Day	08:30	62	55	63	63	64
	12:00	65	57	61	59	60
	15:30	64	56	62	60	63

Table 8.17: Measured Noise Levels at NM2

NM2 was location at the West of Kilbride Industrial Estate, Northeast of the proposed site. The ambient noise environment was primarily made up of background traffic noise, agricultural activities and activity inside the industrial park. The L_{Aeq} ranged from 60 to 64 dB. The L_{A90} ranged from 59 to 63 dB.

Location NM3

Time		Measured Noise Levels (dB re. $2x10^{-5}$Pa)				
		LA_{max}	LA_{min}	LA_{10}	LA_{90}	L_{Aeq}
Day	09:00	67	56	64	58	59
	12:30	64	54	61	52	59
	16:00	65	54	59	54	58

Table 8.18: Measured Noise Levels at NM3

Located at Carrigmor Rd beside residential housing alongside R772, East of the proposed site. Background traffic noise from the R772 to the east was a significant noise source at this location. The proximity of St. Josephs N.S. and Carrigmor housing estate were other noise sources. The L_{Aeq} ranged from 58 to 59 dB. The L_{A90} ranged from 52 to 58dB.

Location NM4

Time		Measured Noise Levels (dB re. $2x10^{-5}$Pa)				
		LA_{max}	LA_{min}	LA_{10}	LA_{90}	L_{Aeq}
Day	09:30	65	51	59	52	56
	13:30	66	54	60	54	58
	16:30	67	52	58	53	57

Table 8.19: Measured Noise Levels at NM4

NM4 was located beside Marshlands Youth and Sports Centre inside Avondale Cres housing estate, Southeast of the proposed site. The ambient noise environment was primarily made up of background traffic noise from R772. Other noise sources included vehicle movement in the housing estate and some agricultural activities. The ambient noise fluctuated from volume of road traffic on the housing estate roads, lawnmowers and children playing. The L_{Aeq} ranged from 56 to 58 dB. The L_{A90} ranged from 52 to 54 dB.

Location NM5

Time		Measured Noise Levels (dB re. $2x10^{-5}$Pa)				
		LA_{max}	LA_{min}	LA_{10}	LA_{90}	L_{Aeq}
Day	10:00	82	57	67	66	65
	14:00	79	58	65	64	64
	17:00	83	57	66	69	67

Table 8.20: Measured Noise Levels at NM5

The dominant noise source at this location was traffic on the M11 motorway and local roads. Background noise from the M11 was also significant noise source at this location. Background noise from traffic on the M11 and agricultural machinery were audible and were a significant noise source at this location. The L_{Aeq} ranged from 68 to 70 dB. The L_{A90} ranged from 66 to 69 dB. The variation in L_{Aeq} can be attributed to the traffic on the roads near the measurement location.

Location NM6 – (In close proximity to the proposed Boardwalk)

Time		Measured Noise Levels (dB re. $2x10^{-5}$Pa)				
		LA_{max}	LA_{min}	LA_{10}	LA_{90}	L_{Aeq}
Day	10:00	52	32	42	40	43
	14:00	51	30	41	40	45
	17:00	53	34	38	41	46

Table 8.21:Measured Noise Levels at NM6

The dominant noise source at this location was traffic on the M11 motorway and local roads. Background noise from traffic on the M11 and agricultural machinery were audible and were a significant noise source at this location. The L_{Aeq} ranged from 43 to 46 dB. The L_{A90} ranged from 40 to 41 dB. The variation in L_{Aeq} can be attributed to the traffic on the roads near the measurement location.

Conclusion

The results of the environmental noise survey study suggest the noise environment will not require additional constraints to be imposed on the majority of the proposed project outside of the normal criteria applicable to a development of the scale and nature of that proposed.

8.5 Potential Impacts

The potential noise and vibration impacts associated with the construction and operational phases of the proposed development are discussed in the following sections.

Construction/Demolition Phase

Noise

A review of the baseline noise survey and the threshold values detailed in Table 8.1 indicates that the daytime noise guidance limit for construction noise is **65dB L_{Aeq}**. It is assumed that construction works will take place during normal working hours only. During the construction phase of the proposed development, a variety of items of plant will be in use, such as excavators, dumper trucks, compressors, and generators.

Due to the nature of daytime activities undertaken on a construction site of this nature, there is potential for generation of significant levels of noise. The flow of vehicular traffic to and from a construction site is also a potential source of relatively high noise levels.

Considering the outline construction programme, it is possible to predict typical noise levels using guidance set out in BS 5228-1:2009+A1:2014. Table 8.22 outlines typical plant items and associated noise levels that are anticipated for various phases of the construction programme.

Activity	Item of Plant (BS5228 Ref)	Noise level at 10m Distance (dB $L_{Aeq\ (1hour)}$)
Site Preparation Phase	Wheeled Loader Lorry (D3 1)	75
	Track Excavator (C2 22)	72
	Dozer (C2.13)	78
	Dump Truck (C4.2)	78
	Cumulative Site Preparation	82
Boardwalk Construction Phase	D500 Piling Rig	85
	Track Excavator (C2 22)	72
	Dump Truck (C2.30)	78
	Cumulative Boardwalk Construction Phase	86
Demolition	Pulveriser on Tracked Excavator (C1.5)	72
	Tracked Crusher (C1.14)	82

	Pulveriser on Tracked Excavator (C1.4)	76
	Dump Truck (C2.30)	79
	Cumulative Demolition	61
General Construction	Dump Truck (C2.30)	79
	Tracked excavator (02.21)	71
	Compressor (D7.08)	70
	Telescopic Handler (C4.54)	79
	Handheld Circular Saw (C4.72)	79
	Diesel Generator (C4.76)	61
	Internal Fit out	70
	Cumulative General Construction	84
Road Works/Landscaping	Asphalt Paver & Tipping Lorry (C5.30)	75
	Electric Water Pump (C5.40)	68
	Vibratory Roller (C5.20)	75
	Cumulative General Landscaping and Road Work	93

Table 8.22: Predicted Noise Levels from Key Pieces of Equipment

The calculations also assume that the equipment will operate for 66% of the 12-hour working day (i.e., 8 hours) and that a standard site hoarding, typically 2.4m height will be erected around the perimeter of the construction site for the duration of works. It is assumed that construction works will take place during normal working hours only. The closest noise sensitive locations (NSL) have been identified as shown in Figure 8.5 and described below in table 8.23.

Noise Sensitive Locations	Description
Location NSL1	This represents a number of houses located to the north of the proposed site approximately 30m from the nearest significant site work.
Location NSL2	This represents Kilbride Industrial Estate located to the north of the proposed site approximately 55m from the nearest significant site work.
Location NSL3	This represents Murell Dr housing estate located to the east of the proposed site approximately 20m from the nearest significant site work.
Location NSL4	This represents Willow Grove housing estate located to the east of the proposed site approximately 22m from the nearest significant site work.
Location NSL5	This represents housing and a packing factory located to the west of the proposed site approximately 200m from the nearest significant site work.

Table 8.23: Description of Noise Measurement Location

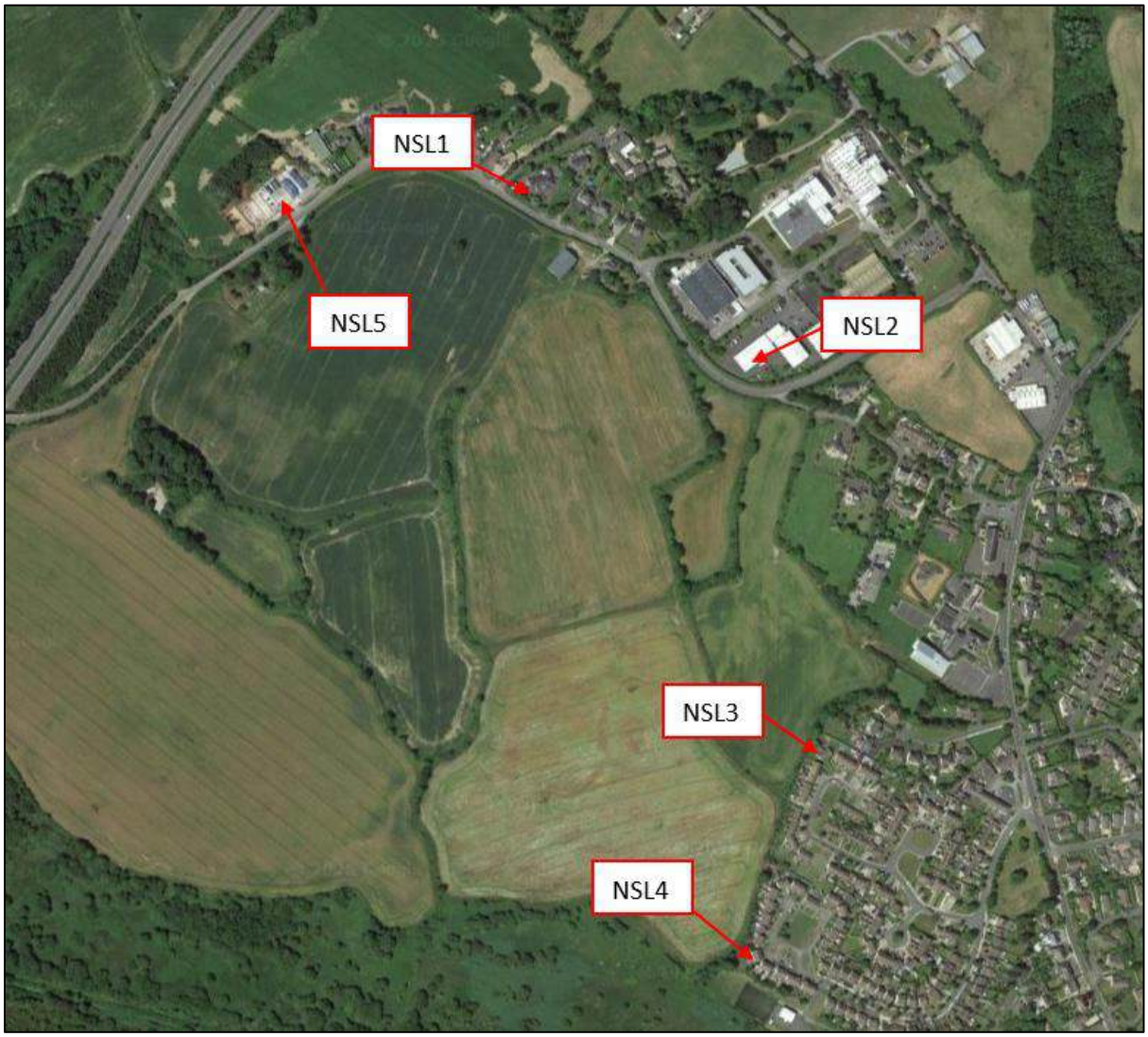


Figure 8.7: Site Context & Noise Assessment Locations (Image Source: Google Maps)

Predicted Noise Level at Various Locations

In order to assess the level of Environmental noise associated with the proposed development a number of noise sensitive locations were considered. Figure 8.5 details the locations from the nearest façade of the neighbouring building to the proposed development.

Table 8.24 and 8.25 below presents the predicted daytime noise levels from an indicative construction period at these noise sensitive locations (NSL).

Construction Phase	Item of Plant (BS5228-1 Ref) Distance from the Site	L_{Aeq} at distance (m)				
		NSL1	NSL2	NSL3	NSL4	NSL5
		30m	55m	20m	22m	200m
Site Preparation		dB	dB	dB	dB	dB
	Wheeled Loader Lorry (D3 1)	66	60	69	68	49

	Track Excavator (C2 22)	63	57	56	55	46
	Dozer (C2.13)	69	63	72	71	52
	Dump Truck (C4.2)	69	63	72	72	52
	Cumulative Site Preparation	**73**	**67**	**76**	**75**	**56**
Demolition Phase	Pulveriser on Tracked Excavator (C1.5)	63	57	56	55	46
	Tracked Crusher (C1.14)	73	67	76	75	56
	Dump Truck (C2.30)	70	64	72	71	52
	Cumulative Demolition	75	69	78	77	58
General Construction Phase	Dump Truck (C2.30)	70	64	72	71	53
	Tracked excavator (02.21)	62	56	66	65	46
	Compressor (D7.08)	61	55	64	63	44
	Telescopic Handler (C4.54)	70	64	73	72	53
	Handheld Circular Saw (C4.72)	70	64	73	72	53
	Diesel Generator (C4.76)	52	52	55	54	35
	Internal Fit out	61	55	64	63	44
	Cumulative General Construction	**75**	**70**	**78**	**77**	**58**
Road Works/ Landscaping Phase	Asphalt Paver & Tipping Lorry (C5.30)	66	60	69	68	49
	Electric Water Pump (C5.40)	59	53	62	61	42
	Vibratory Roller (C5.20)	66	60	69	68	49
	Cumulative General Landscaping and Road Work	**69**	**63**	**72**	**71**	**52**

Table 8.24: Indicative Construction Noise Levels at Nearest Noise Sensitive Locations

Construction Phase	**Item of Plant (BS5228-1 Ref)** **Distance from the Site**	**L_{Aeq} at distance (m)**				
		NSL1	**NSL2**	**NSL3**	**NSL4**	**NSL5**
		856m	**680m**	**309m**	**86m**	**964m**
Boardwalk Construction Phase	D500 Piling Rig	**46**	**48**	**55**	**66**	**45**
	Track Excavator (C2 22)	**33**	**35**	**42**	**53**	**33**
	Dump Truck (C2.30)	**40**	**42**	**49**	**60**	**39**
	Cumulative Boardwalk Construction Work	**48**	**49**	**56**	**67**	**46**

Table 8.25: Indicative Construction Noise Levels at Nearest Noise Sensitive Locations (Boardwalk Construction)

Taking into account these assumptions and allowing for the attenuation of sound over distance, the predicted construction noise level at the nearest sensitive properties is above the relevant construction noise criteria, i.e., the level at which a potential significant impact could be expected to occur, at noise sensitive locations closest to the works. Also, considering the proximity of NSL1 NSL2, NSL3 and NSL4 has a potential significant impact at all construction phases in the absence of mitigation (Table 8.24). NSL5 is located approximately 200m from the general site construction works. The

boardwalk Construction works will be carried out further away from the Noise Sensitive Locations (NSLs) and the noise risk to these NSLs will be significantly reduced.

A Review of the predicted noise levels at these locations are above the criteria at which a significant impact is deemed to occur (65dB $L_{Aeq,T}$) and therefore, in the absence of noise mitigation, a **negative**, significant and **short-term** impact is likely.

Construction Traffic

The noise levels associated with mobile plant items such as concrete mixer trucks, loaders etc. operational on site have been included as part of the construction noise assessment and calculated noise levels in Table 8.24. Consideration should also be given to the addition of construction traffic along the site access routes. Access to the development site for construction traffic will be via the Avoca River Park Road to the north of the proposed development.

It is possible to calculate the noise levels associated with the passing vehicle using the following formula.

$$L_{Aeq,T} = L_{AX} + 10\log_{10}(N) - 10\log_{10}(T) + 10\log_{10}(r_1/r_2)dB$$

Where: $L_{Aeq,T}$ = is the equivalent continuous sound level over the time period Tin seconds.
L_{AX} = is the "A-weighted" Sound Exposure Level of the event considered(dB).
N = is the number of events over the course of time period T.
r_1= is the distance at which LAX is expressed.
r_2= is the distance to the assessment location

A calculation distance of 5m from the road has been used to assess noise levels at the closest buildings along the construction routes. The mean value of Sound Exposure Level for truck moving at low to moderate speeds (i.e., 15 to 45km/hr) is of the order of 82dB L_{ax} at a distance of 5 metres from the vehicle. This figure is based on a series of measurements conducted under controlled conditions. Construction vehicles are predicted in the table below for peak hours associated with each key phase. Table 8.26 below summarises the calculated noise level associated with passing haul vehicles during each the works, assuming the peak hour flows per day.

Construction Phase	No. of Trucks/peak hour	Calculated Noise at edge of road (5m),dB $L_{Aeq,\ 1hr}$
During Construction	5	82

Table 8.26: Calculated Construction Traffic Noise Levels at Edge of Road

It should be noted that, in order to assess a worst- case scenario, a substantial proportion of the daily vehicle numbers have been assumed to arrive/depart over an hour-long period. The associated impact with these activities is considered to be neutral, imperceptible, and short-term providing mitigation measures are followed.

Boardwalk Construction

It is proposed to construct greenway infrastructure in the form of a boardwalk which crosses the

marshlands to the south of the proposed development in order to increase connectivity and permeability to the centre of Arklow Town. The proposed infrastructure shall traverse Wicklow County Council owned lands and will consist of a 3.0m wide shared cycle and footpath along a raised decking structure.

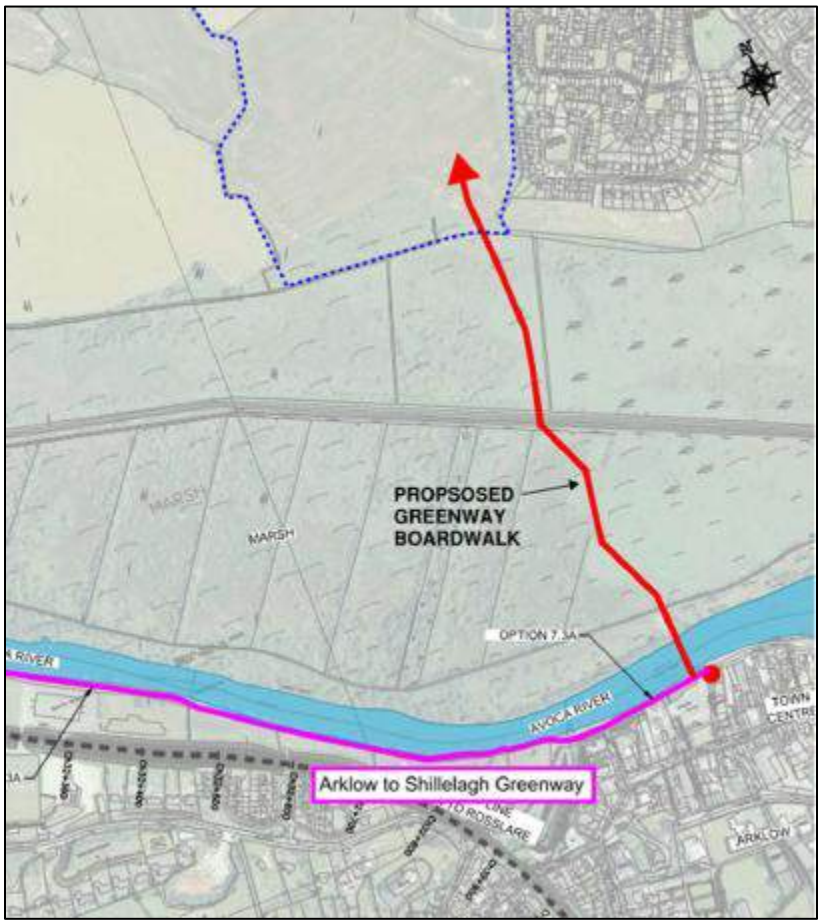


Figure 8.8: Proposed tie in of Boardwalk to Arlow to Shillelagh Greenway (Image Source: Greenway Boardwalk: Outline Construction Methodology)

The use of steel end driven piled foundations will ensure that excavation of soils within the marsh area will be kept to a minimum. As the piles are end drive steel pile there are no soil arisings form the piling operation which will require disposal. The piles are filled with concrete and a single 25mm steel reinforcing bar. In-situ concrete will be placed with mini concrete trucks and concrete pumps will be utilised. Furthermore, any construction operations, such as piling, which have the potential to cause noise and vibration will not be carried out at times which are considered to be noise sensitive such as early in the morning or late in the evening.

To minimise construction work in the marshland, it is proposed that precast concrete pile caps will be used onto which the steel framed boardwalk will be connected. This outline construction plan for boardwalk construction across the marsh and Avoca River has been developed to ensure and demonstrate that the construction methodology has been carefully considered and that appropriated forms of temporary and permanent construction area adapted to minimize the impact on the existing marsh environment. Reduction/elimination of mass excavation for temporary construction roads through use of bog mats placed directly onto the existing ground. Eliminate use of imported stone fill

which will facilitate the restoration of the marsh lands to pre-construction conditions. The outline plan will be used by the appointed contractor to develop a full Construction Plan and Methodology prior to construction.

Note that these are unweighted estimates assuming ideal conditions. No terrain, wind, absorption or reflections. It is expected that real world readings will differ due to these features. The figures also represent the worst-case scenario as the distances are measured from the south boundary of the site.

Predicted Archaeological Test

The Archaeologist noted, Archaeological monitoring of topsoil stripping across the Phase 1 development site shall be carried under licence to the National Monuments Service (Department of Housing, Local Government and Heritage) and the National Museum of Ireland. Monitoring will include all works in the Town Marsh, which may not be suitable for pre-construction archaeological test-excavation, subject to ground conditions or natural heritage constraints. Any potential groundworks at the Avoca Riverbank or in the riverbed shall also be monitored by an appropriately qualified or maritime archaeologist unless otherwise archaeologically resolved in advance as part of the Arklow Flood Relief Scheme works. Should archaeologically features or material be uncovered during the construction phase, on-going archaeological mitigation shall be made in agreement with the statutory bodies. The pre- development archaeological test trenching will have a negative, moderate, and short-term impact.

Vibration

The main potential source of vibration during the construction programme is associated ground-breaking activities & piling for boardwalk.

Considering the low vibration levels at very close distances to the ground-breaking activities, vibration levels at the nearby buildings are not expected to pose any significance in terms of cosmetic or structural damage to any of the residential or sensitive buildings in proximity to the development works. In addition, the range of vibration levels is typically below a level which would cause any disturbance to occupants of nearby buildings. Furthermore, piling may have an impact on nearby buildings. The marshland may supress the vibration from the impact, it is recommended that vibration monitors are installed near sensitive area e.g. old homes/buildings.

It is anticipated that excavations will be made using standard excavation machinery, which typically do not generate appreciable levels of vibration close to the source. Taking this into account and considering the distance that these properties are from the works and the attenuation of vibration levels over distance, the resultant vibration levels are expected to be well below a level that would cause disturbance to building occupants or even be perceptible.

The associated impact with these activities is considered to be **neutral** and **imperceptible.**

Operational Phase

Noise

There are six primary potential sources of noise associated with the development once operational these are:

- Additional vehicular traffic on public roads.
- Mechanical plant noise.
- Residential.
- Creche
- Commercial/Retail Unit
- Public Open Space

Each of these primary noise sources is addressed in turn in the following sections.
Note there is no significant source of vibration associated with the operational phase of the proposed development.

Additional Traffic on Adjacent Roads

During the operational phase of the proposed development, there will be an increase in vehicular traffic associated with the site on some surrounding roads.

A traffic impact assessment relating to the proposed development has been prepared by SYSTRA, as part of this EIAR. Using this information and Project Appraisal Guidelines from Transport Infrastructure Ireland related noise impacts of the road links has been assessed.

With reference to Traffic and Transportation Chapter, the predicted change in noise level associated with additional traffic accessing the proposed development, for the existing road network, has a negligible effect. The impact is therefore **imperceptible** and **long term**

Inward Noise Assessment

The initial noise risk assessment is intended to provide an early indication of any acoustic issues that may be encountered. It calls for the categorisation of the site as a negligible, low, medium, or elevated risk based on the pre-existing noise environment. Figure 9-2 presents the basis of the initial noise risk assessment. It provides appropriate risk categories for a range of continuous Paragraph 2.9 of ProPG states that,

"The noise risk assessment may be based on measurements or prediction (or a combination of both) as appropriate and should aim to describe noise levels over a "typical worst case" 24-hour day either now or in the near future."

In this instance a 3D computer noise model of the development site has been developed to predict the noise levels across the entire site in order to investigate the initial noise risk. Noise levels measured on site will be used to validate the model. Model Validation Noise levels recorded or calculated from the baseline noise survey were used to calibrate the noise model. It is considered that a strong correlation in respect of predicted noise levels has been achieved. Noise levels are calculated over daytime periods, (07:00 to 23:00 hrs) and night-time periods (23:00 to 07:00 hrs). Table 8.27 details the results of the noise model predictions and compares them to the measured values at the survey location.

Location	Period	Measured from Baseline Survey (dB LA_{eq})	Predicted in Model (dB LA_{eq})
A	Day	54	53
	Night	40	41
B	Day	48	48
	Night	34	35
C	Day	54	52
	Night	47	46

Table 8.27: Noise Model Validation

Noise Model Output

For the purpose of the initial noise risk assessment across the development site the noise model has been used to prepare noise contour maps for both daytime and night-time periods at the site, this is to give an indication of expected noise levels at various levels of the proposed development. These maps are presented in Figures below.

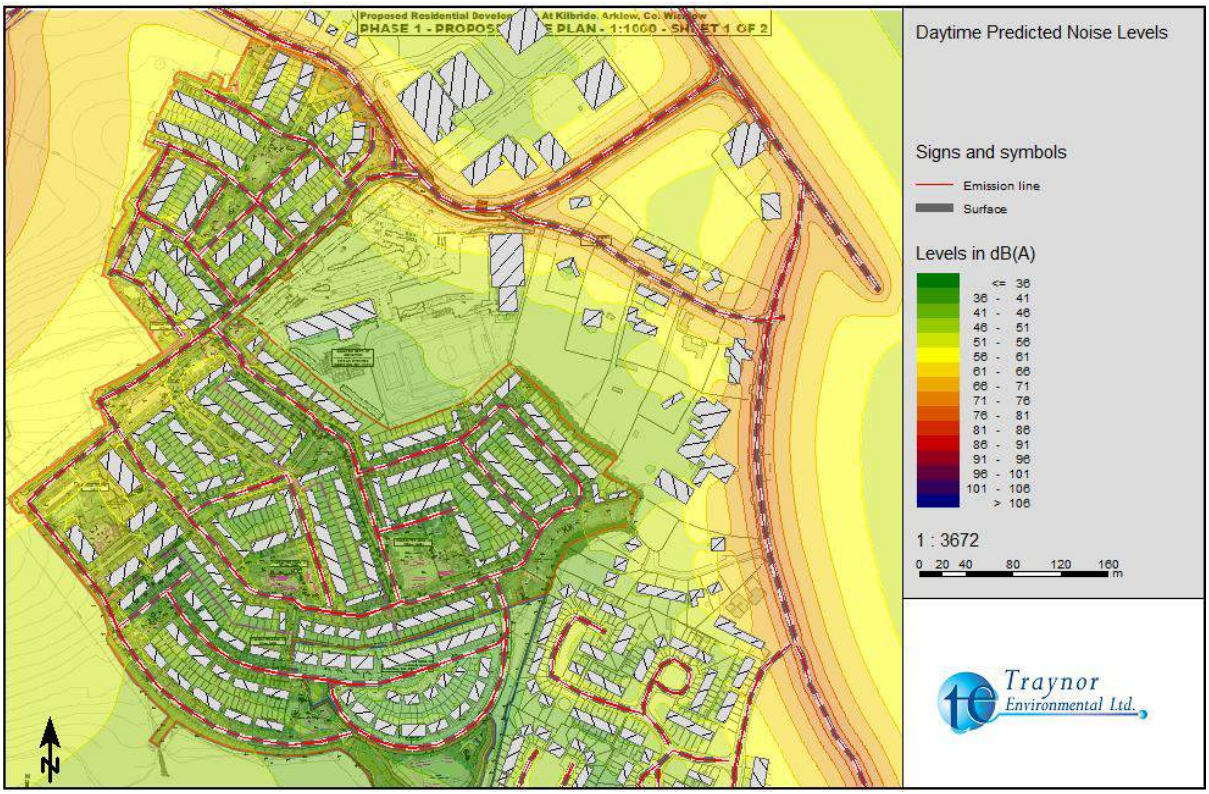


Figure 8.9: Daytime Predicted Noise Levels

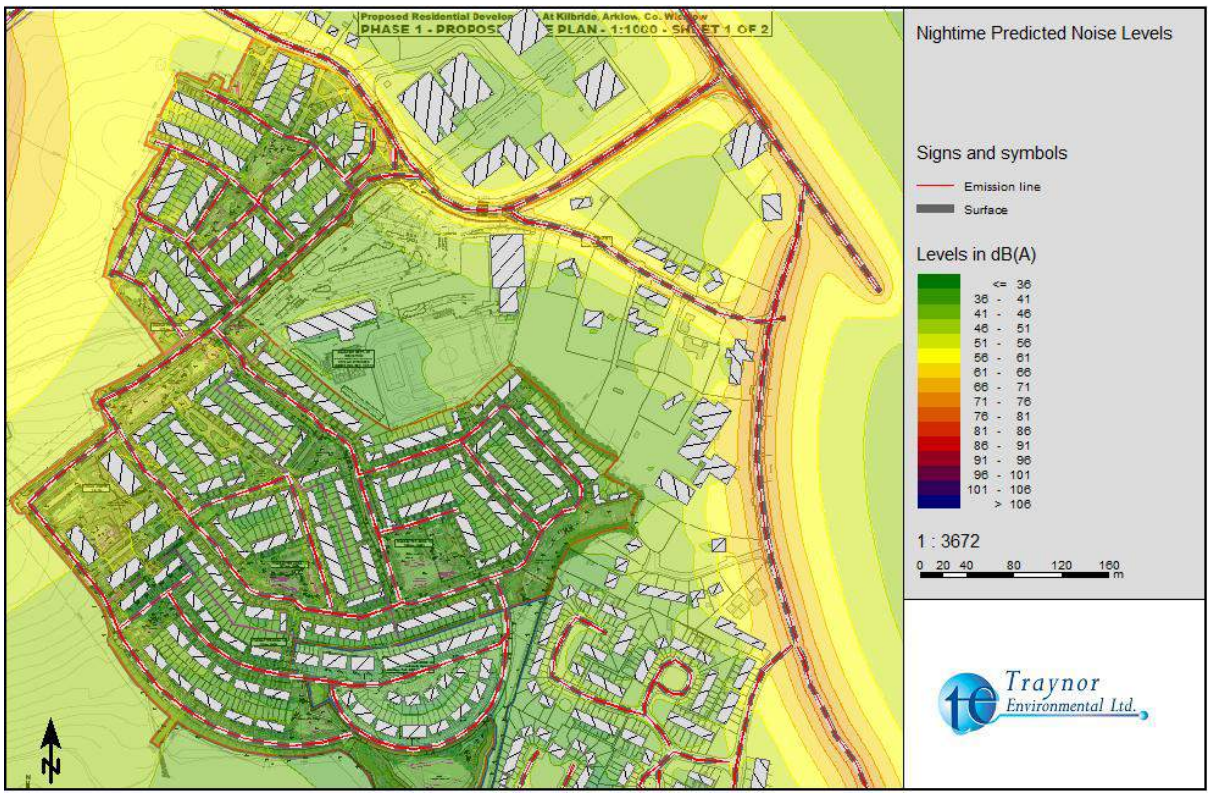


Figure 8.10: Nighttime Predicted Noise Levels

ProPG Stage 1 - Noise Risk Assessment Conclusion

Giving consideration to the measured and predicted noise levels presented in the previous sections the site noise risk assessment has concluded that the level of risk across the site varies from negligible to low noise risk.

ProPG states the following with respect to negligible to medium risks:

Negligible Risk: *These noise levels indicate that the development site is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds.*

Low Risk: *At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.*

Medium Risk: *As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development.*

Given the above it can be concluded that the development site may be categorised as Negligible to Low Risk and as such an Acoustic Design Strategy will be required to demonstrate that suitable care and attention has been applied in mitigating and minimising noise in the finished development.

It should be noted that ProPG states the following with regard to how the site noise risk assessment is to be used,

"2.12 It is important that the assessment of noise risk at a proposed residential development site is not the basis for the eventual recommendation to the decision maker. The recommended approach is intended to give the developer, the noise practitioner, and the decision maker an early indication of the likely initial suitability of the site for new residential development from a noise perspective and the extent of the acoustic issues that would be faced. Thus, a site considered to be elevated risk will be recognised as presenting more acoustic challenges than a site considered as low risk. A site considered as negligible risk is likely to be acceptable from a noise perspective and need not normally be delayed on noise grounds. A potentially problematical site will be flagged at the earliest possible stage, with an increasing risk indicating the increasing importance of good acoustic design."

Therefore, following the guidance contained in ProPG this does not preclude residential development on sites that are identified as having negative to low noise levels. It merely identifies the fact that a more considered approach will be required to ensure the developments on the higher risk sites are suitably designed to mitigate the noise levels. The primary goal of the approach outlined in ProPG is to ensure that the best possible acoustic outcome is achieved for a particular site.

- Acoustic Design Strategy (Part 1)
- Façade Noise Levels

Noise levels have been predicted across the site during day and night-time periods with the proposed buildings in place.

Where façade noise levels are less than 55 dB LAeq,16hr during the day and 50 dB LAeq,8hr at night it is possible to achieve reasonable internal noise levels while also ventilating the dwellings with open windows. Therefore, for those properties where the façade noise levels are less than 55 dB LAeq,16hr during the day and 50 dB LAeq,8hr at night no further mitigation is required.

Where façade levels are above these levels the sound insulation performance of the building façade becomes important, and a minimum sound insulation performance specification is required for windows and vents to ensure that the internal noise criteria are achieved.

Yellow highlighting in Figure below identifies facades where the noise levels are higher and where mitigation in the form of enhanced glazing and ventilation will be required. These affected facades face on to M11. The specification of this enhanced façade is discussed in Section 8.7.2. Note that any façade that is not highlighted has been predicted to fall below 55 dB LAeq,16hr during the day and 50 dB LAeq,8hr at night, therefore mitigation is not required for these facades.

The impact is therefore **imperceptible** and **long term**.

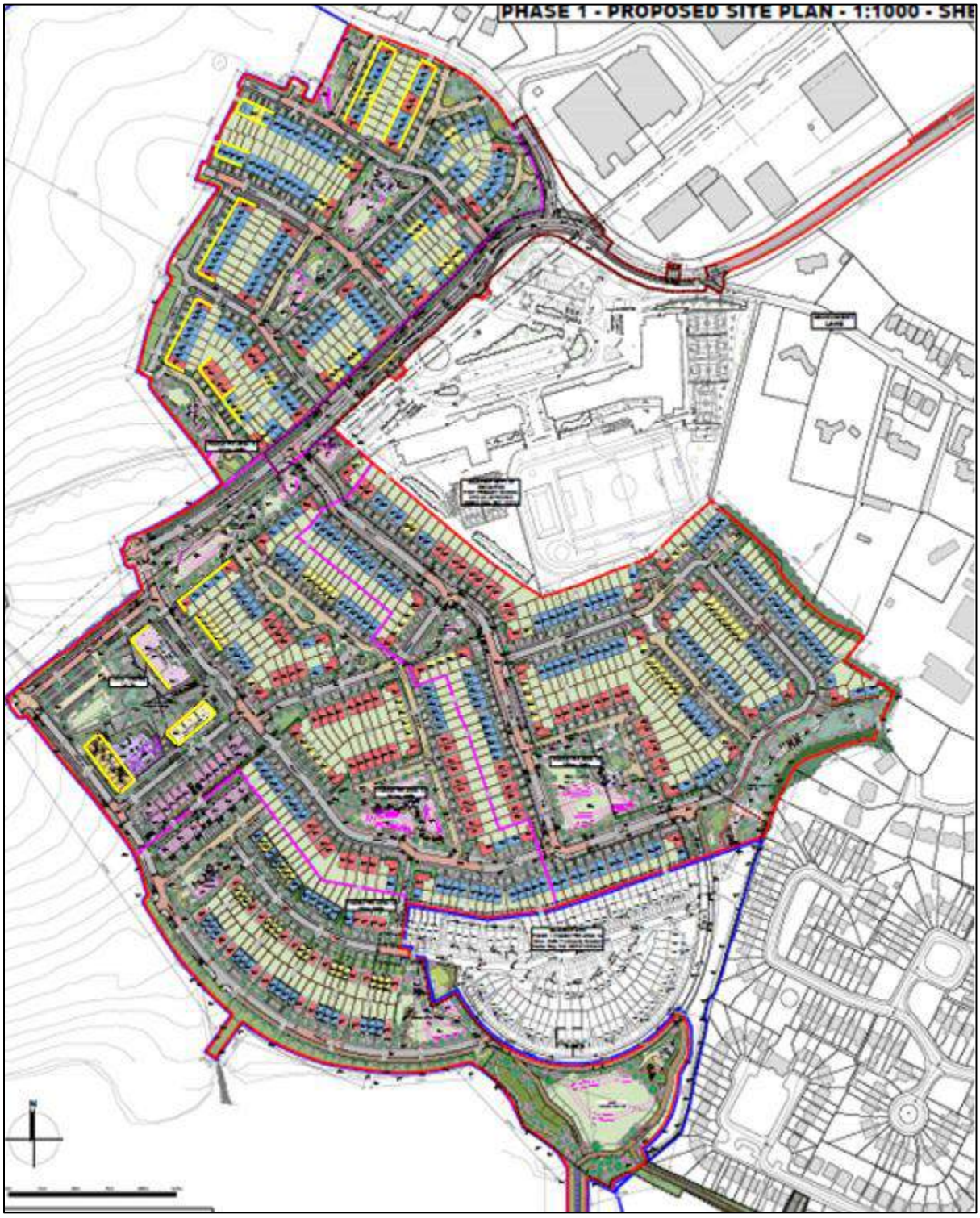


Figure 8.11: Facades Requiring Enhanced Acoustic Specification (Highlighted in Yellow)

Mechanical Plant

Once operational, there will be building services plant items required to serve the development. These items of plant will be designed and located so that there is no negative impact on sensitive receivers within the development itself or on nearby sensitive receptors. The cumulative operational noise level from building services plant at the nearest noise sensitive locations external to the development will be designed/attenuated to meet the relevant BS 4142 noise criteria for day and night-time periods

provided in Table 8.28 below. The criteria have been selected so that the noise from items of plant does not exceed background noise levels during the day. An estimation of 10 dB difference between day and night has been used to determine nighttime noise levels. As per BS4142 these noise levels would be "an indication of the specific sound source having a low impact".

Day, dB LAeq,1hr	Night, dB LAeq,15min
45	35

Table 8.28: Proposed Noise Criteria for Plant Noise

Residential

The noise impact of the residential aspect of the development on the receiving environment will be slight. It will be limited to internal vehicle movements entering and exiting the carpark, and residents using the public open space which will be screened by the retail units, creche and commercial facilities. The Acoustic Design Strategy for the development will protect resident in accordance with ProPG Internal Noise Levels. The impact is therefore imperceptible and long term.

Commercial/Retail Units

The commercial/retail units of the development will also have a potential noise impact on the residential aspect of the development; however, this aspect of the development is expected not to occur during the night-time period. The main noise associated with a commercial/retail premises is from deliveries by lorries or van and from external speakers. External speakers shall not be used at any of the retail units.

All deliveries will be only permitted between 07:00hrs – 19:00hrs, in order to ensure that this activity does not impact the more sensitive night-time period. Retail units shall be posted appropriate signage to this effect. The impact is therefore **imperceptible** and **long term**.

Community/Medical Units

The community/medical units of the development will also have a potential noise impact on the residential aspect of the development; however, this aspect of the development is expected not to occur during the night-time period. The main noise associated with a community/medical unit premises is from deliveries by lorries or van and visitors using the facilities.

All deliveries will be only permitted between 07:00hrs – 19:00hrs, and visitors of the units will be during normal visiting hours. This activity does not impact the more sensitive night-time period. The impact is therefore **imperceptible** and **long term**.

Creche

The Creche will serve the residents of the development. The opening hours of the creche is expected to be a full-time service between 07:00am to 6:00pm. The noise of children playing in any environment is regarded as a natural aspect of life in any area of a development. Noise impacts will be slight which causes noticeable changes in the character of the environment without affecting its sensitivities.

Considering that sensitive receivers within the development are much closer than off-site sensitive receivers, once the relevant noise criteria is achieved within the development and mitigation

measures are in place will be no negative impact at sensitive receivers off site. The impact is therefore **imperceptible** and **long term**.

Boardwalk

The boardwalk will have a potential noise impact on the residential aspect of the development once operational; however, due to the distance from the majority of the residential development this will be minimal. The impact is therefore **imperceptible** and **long term**.

Public Open Space

The public open space will also have a potential noise impact on the residential aspect of the development; however, this aspect of the development will not occur during the night-time period. The main noise associated with the public open space will be for amenity purposes. The impact is therefore **imperceptible** and **long term**.

Potential Impact -Prior to Mitigation for construction and operation phases

Potential impacts in relation to human health in the absence of mitigation are listed below:

- Noise induced hearing loss
- Health problems for people and wildlife
- Health and well-being of wildlife
- High blood pressure
- Heart disease
- Sleep disturbances
- Stress.

8.6 Potential Cumulative Impacts

Construction/Demolition Phase

During the construction/demolition phase of the proposed development, construction/demolition noise on site will be localised and will therefore likely be the primary noise source at the nearest noise sensitive receivers. In the event that construction activities associated with the majority of developments noted below occur simultaneous to the proposed development, they are at sufficient distances such that the cumulative noise levels will remain dominated by the localised works.

There are several proposed or permitted developments in the wider area surrounding the proposed development under assessment. These are as follows:

Planning Application Details		Development Description
Planning Reference	22213	Construction of a new educational campus and a new link road that will service the school campus which will include the provision of two school buildings. Proposed site works to include the construction of all new hard play areas, six play-courts, grass pitch, 182 no. car-
Status	Granted	

Location	Kilbride Educational Campus, Kilbride.	parking spaces together with boundary treatment, 79 bicycle stands, ancillary infrastructure works, pedestrian links and landscaping.
Planning Reference	ABP 302556 18	Construction of a new wastewater treatment plant, interceptor sewers including storm water overflows and stormwater storage, sea outfall pipelines, and an upgrade to a section of the coastal revetment all in the townlands of Arklow, Tinahask Lower and Ferrybank, County Wicklow.
Status	Granted	
Location	Arklow, Co. Wicklow	
Planning Reference	24325	7-year permission for a Large-Scale Residential Development. The proposed development will consist of the following: Construction of 476 no. residential units, Communal open space and public open space in the form of 13 no. local parks. Provision of 930 no. car parking spaces, 400 no. bicycle parking spaces for residents and 37 no. visitor bicycle parking spaces.
Status	Granted	
Location	South of Arklow Town	
Planning Reference	23756	84 no. residential units with a mix of detached, semi-detached, terraced houses and duplex apartments ranging in height from 2 to 3 storeys; comprising of 8 no. 1-bed and 8 no. 2-bed duplex apartments, 10 no. 2-bed houses and 60 no. 3-bed houses.
Status	Granted	
Location	Lands at Kilbride, Arklow, Co. Wicklow	
Planning Reference	2484	Construction of 99 residential units comprising 59 no. apartments with four blocks, construction of a 350 sqm mixed use building of four storeys containing 350 sqm of retail space at ground floor and residential units above; refurbishment, extension and change of use from a derelict two storey house to a 146.3 sqm creche; 169 no. car parking spaces and 196 no. bicycle parking spaces provided at basement and surface level.
Status	Granted	
Location	Upper Main Street, Arklow, Co. Wicklow	
Planning Reference	24352	Construct 74 No. Social Housing Units and all associated works. The accommodation shall consist of the following: 2 No. four bedroom storey and a half units, 17 No. three bedroom two storey units, 45 No. two bedroom two storey units, 2 No. one bedroom apartments in a two-storey unit and 8 No. one bedroom single storey units.
Status	Granted	
Location	Tinahask, Townland of Tinahask Upper, Arklow, Co. Wicklow	

Planning Reference	2460284	Discount Foodstore Supermarket with ancillary off-licence sales on an extended site. The proposed development comprises: 1) The demolition of existing single storey Discount Foodstore (with ancillary off-licence use) measuring c. 1,357 sqm gross floor space with a net retail sales area of c. 985 sqm; 2) The demolition of existing 1 no. two storey and 2 no. single storey commercial buildings measuring c. 1,191 sqm overall and associated and ancillary site clearance of former Healy Premises; 3) The construction of a single storey Discount Foodstore Supermarket with ancillary off-licence use (and mezzanine plant deck) measuring c. 2,290 sqm gross floor space with a net retail sales area of c. 1,452 sqm.
Status	Granted	
Location	Lidl, Wexford Road, Arklow, Co. Wicklow, Y14 HY80	
Planning Reference	24285	Construction of 3 no. detached houses with new access entrance and connection to existing services.
Status	Granted	
Location	Knockenrahan Upper, Wexford Road, Arklow, Co. Wicklow	
Planning Reference	23843	The proposed development includes an amendment to the development permitted under Reg. Ref. 21/1080, The proposed development will provide for a revised energy centre design, to include the provision of 8 no. gas turbines (with associated flues of 25.15m in height), 4 no. black start emergency generators and associated transformers, 2 no. single storey fuel oil pump rooms with a gross floor area (GFA) of 90.17sq.m, a single storey air compressor building with a GFA of 88.9sq.m, 4 no. fuel tanks, 2 no. MCC control rooms with a GFA of 44.17sq.m, 3 no. fire water tanks, a single storey welfare, storage, and pump room building with a combined GFA of 160.97 sq.m, a two storey MV /LV building with a GFA of 655.54sq.m, 8 no. 11kV/ 33kV step-up transformers in the north of the site, water treatment equipment, and a security hut, all within a fenced compound.
Status	Granted	
Location	Site at Avoca River Park, Arklow, Co. Wicklow	
Planning Reference	23381	Demolition of the existing three storey detached office building (646 sqm) and single storey outbuilding (30 sqm); and the construction of a new five storey apartment block (3,196 sqm GFA) comprising of 34 No. apartments (14 No. one-bed apartments and 20 No. two-bed apartments)
Status	Granted	
Location	Arklow Shipping premises, North Quay, Arklow, Co Wicklow	

Planning Reference	2372	The proposed development consists of the following: Demolition of the existing structures on site (industrial structures and outbuildings) and site clearance works; construction of 3 no. three storey information and communication technology (ICT) facility buildings, each with a gross floor area (GFA) of c. 16,206 sq.m (c. 48,618sq.m GFA in total), and with a parapet height of c. 19.5 metres; each of the 3 no. ICT buildings will accommodate ICT equipment rooms, mechanical equipment rooms, staff welfare facilities, ancillary office space, security rooms, storage, and loading bays; a customer compound, a power trunk building, a transformer compound and a water tank compound area are provided to the north of the ICT facility buildings;
Status	Granted	
Location	Site located at Avoca River Park, Arklow, Co. Wicklow	
Planning Reference	22433	the installation of underground electrical infrastructure between the existing Arklow Gas-insulated Switchgear (GIS) 220kV Substation and the permitted Pollahoney GIS Substation. This will include the installation of approximately two underground electricity cable circuits, each at 3.12km in length and associated underground ducting, horizontal directional drilling, joint bays, communication cabling infrastructure between the existing Arklow GIS 220kV Substation and the permitted Pollahoney GIS substation, (WCC reg ref 20/1285).
Status	Granted	
Location	Townlands of Killiniskyduff, Tiknock, Kilbride, and Shelton Abbey	

Table 8.29: Cumulative Developments

In the event that works on site and works associated with proposed or permitted developments were ongoing simultaneously, there is potential for cumulative noise impacts at all NSLs. Under this scenario, construction activities will be audible at a number of facades of the residential areas due to their location with respect to both areas of works.

The contractor will be required to control noise and vibration impacts associated with this development in line with the guidance levels included in Table 8.1 and Table 8.2 and follow the best practice control measures within BS 8228-2.The impact from any construction works associated with the other developments listed above is considered to be imperceptible as these works are expected to take place at large distances to the most exposed noise sensitive receivers to the proposed development under assessment.

Operational Phase

The operational phase of the development listed above have the potential to generate additional traffic on the roads in the vicinity of the local area. These additional vehicle movements have been considered in combination with those that will be generated by neighbouring developments. This is detailed in the traffic assessment for the operational phase of the potential impact section. The cumulative impact of the proposed development in combination with neighbouring developments has been determined as imperceptible and long term.

Potential Cumulative Impacts

Construction/Demolition Phase - Noise

With regard to construction/demolition activities, best practice control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) *Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2*. Whilst construction noise and vibration impacts are expected to vary during the construction phase depending on the distance between the activities and noise sensitive buildings, the contractor will ensure that all best practice noise and vibration control methods will be used, as necessary in order to ensure impacts at off-site noise sensitive locations are minimised.

The best practice measures set out in BS 5228 (2009) Parts 1 and 2 includes guidance on several aspects of construction site mitigation measures, including, but not limited to:

- Selection of quiet plant.
- Noise control at source.
- Screening.
- Liaison with the public
- Monitoring

A detailed comment is offered on these items in the following paragraphs. Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise and vibration monitoring, where required.

Selection of Quiet Plant

This practice is recommended in relation to static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action should be to identify whether or not said item can be replaced with a quieter alternative.

Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.

Referring to the potential noise generating sources for the works under consideration, the following best practice mitigation measures should be considered:

- Site compounds will be located in excess of 30m from noise sensitive receptors within the site constraints. The use lifting bulky items, dropping and loading of materials within these areas should be restricted to normal working hours.

- For mobile plant items such as dump trucks, excavators and loaders, the installation of an acoustic exhaust and/or maintaining enclosure panels closed during operation can reduce noise levels by up to 10dB. Mobile plant should be switched off when not in use and not left idling.
- For steady continuous noise, such as that generated by diesel engines, it may be possible to reduce the noise emitted by fitting a more effective exhaust silencer system or utilising an acoustic canopy to replace the normal engine cover. For concrete mixers, control measures should be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum.
- For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.
- For compressors, generators and pumps, these can be surrounded by acoustic lagging or enclosed with in acoustic enclosures providing air ventilation.
- Demountable enclosures can also be used to screen operatives using hand tools and will be moved around site as necessary.
- All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.
- While piling including works relating to the boardwalk, install portable sound barriers between the pile driving site and nearby NSL. On marshlands, barriers mounted on work barges or floating sound curtains are recommended.

Screening

Screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. Construction site hoarding will be constructed around the site boundaries as standard. The hoarding will be constructed use standard plywood material to provide adequate sound insulation.

In addition, careful planning of the site layout will also be considered. The placement of site buildings such as offices and stores will be used, where feasible, to provide noise screening when placed between the source and the receiver.

Liaison with the Public

A designated environmental liaison officer will be appointed to site during construction works. Any noise complaints should be logged and followed up in a prompt fashion by the liaison officer. In addition, where a particularly noisy construction activity is planned or other works with the potential to generate high levels of noise, or where noisy works are expected to operate outside of normal working hours etc., the liaison officer will inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

Monitoring

Where required, construction noise monitoring will be undertaken at periodic sample periods at the nearest noise sensitive locations to the development works to check compliance with the construction noise criterion.

Noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: *Acoustics - Description, measurement and assessment of environmental noise.*

Project Programme

The phasing programme will be arranged so as to control the amount of disturbance in noise and vibration sensitive areas at times that are considered of greatest sensitivity. During excavation or when other high noise generating works are in progress on a site at the same time as other works of construction that themselves may generate significant noise and vibration, the working programme will be phased so as to prevent unacceptable disturbance at any time.

8.7 Mitigation Measures

Construction Phase - Vibration

The vibration from construction/demolition activities including the boardwalk construction will be limited to the values set out in Tables 8.2 and 8.3. Magnitudes of vibration slightly greater than those in the table are normally unlikely to cause cosmetic damage, but construction work creating such magnitudes should proceed with caution. Limit values have been provided for soundly constructed residential and commercial properties.

The best practice mitigation measures set out below:

- Liaison with the public
- Monitoring
- Vibration Control at Source

Liaison with the Public

A designated environmental liaison officer will be appointed to site during construction works. Any vibration complaints will be logged and followed up in a prompt fashion by the liaison officer. In addition, where a particular vibration construction activity is planned or other works with the potential to generate high levels of vibration, or where vibration works are expected to operate outside of normal working hours etc., the liaison officer will inform the nearest noise sensitive locations of the time and expected duration of the vibration works.

Vibration Control at Source

If replacing a vibration item of plant is not a viable or practical option, consideration will be given to control "at source". This refers to the modification of an item of plant or the application of improved vibration reduction methods in consultation with the supplier.

In order to effectively manage vibration at Arklow Castle ruin and Ormonde Cinema located to the east of the proposed site and on the proposed site, installation of continuous data logging live noise

and vibration monitoring system is required. This software will require remote login, data download and text/email alert functionality. It will measure key vibration parameters (e.g.PPV(mm/sec)) and Frequencies as Hz.

Operational Phase

Additional Traffic on Adjacent Roads

During the operational phase of the development, noise mitigation measures with respect to the outward impact of traffic from the development are not deemed necessary.

Mechanical Services Plant

Noise levels associated with operational plant are expected to be well within the adopted day and night-time noise limits at the nearest noise sensitive properties taking into account the site layout, the nature and type of units proposed and distances to nearest residences. Assuming the operational noise levels do not exceed the adopted design goals, the resultant residual noise impact from this source will be of neutral, Imperceptible, long-term impact.

Inward Noise (Acoustic Design Strategy Part 2)

As is the case in most buildings, the glazed elements and ventilation paths of the building envelope are typically the weakest element from a sound insulation perspective. In general, all wall constructions (i.e. blockwork or concrete and spandrel elements) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal. In this instance the facades highlighted in Figure 8.8 will be provided with upgraded acoustic glazing and ventilation that achieves the minimum sound insulation performance as set out in the tables below. Other facades in the development have no minimum requirement for sound insulation.

The sound insulation specifications are expressed in the following units:

R_w	Weighted Sound Reduction Index – This is the value of the sound insulation performance of a partition or element measured under laboratory conditions. It is a weighted single figure index that is derived from values of sound insulation across a defined frequency spectrum. Technical literature typically presents sound insulation data in terms of the Rw parameter.
$D_{n,ew}$	Weighted element-normalized level difference. This is the value of sound insulation performance of a ventilator measured under laboratory conditions. It is a weighted single figure index that is derived from values of sound insulation across a defined frequency spectrum. Technical literature for acoustic ventilators typically presents sound insulation data in terms of the Dn,e,w parameter.

SRI (dB) per Octave Band Centre Frequency (Hz)						dB R_w
125	250	500	1k	2k	4k	38

Table 8.30: Sound Insulation Performance Requirements for Upgraded Glazing and ventilation, SRI (dB)

The overall R_w and $D_{n,e,w}$ outlined above are provided for information purposes only. The over-riding requirements are the octave band sound insulation performance values which may also be achieved

using alternative glazing and ventilation configurations. Any selected system will be required to provide the same or greater level of sound insulation performance as that set out in Tables above. It is important to note that the acoustic performance specifications detailed herein are minimum requirements which apply to the overall glazing and ventilation systems. In the context of the acoustic performance specification the 'glazing system' is understood to include any and all of the component parts that form part of the glazing element of the façade, i.e. glass, frames, seals, openable elements etc. The assessment has demonstrated that the recommended internal noise criteria can be achieved through consideration of the proposed façade elements at the detailed design stage. The calculated glazing and ventilation specifications are preliminary and are intended to form the basis for noise mitigation at the detailed design stage. Consequently, these may be subject to change as the project progresses.

8.8 Predicted Impacts

Construction/Demolition Phase

During the construction/demolition phase of the project there is the potential for significant and moderate impacts on nearby noise sensitive properties due to noise emissions from site activities.

The demolition phase of the re-development of site shall be conducted utilising standard demolition techniques in accordance with industry standards.

This stage of demolition will generate medium levels of noise generated principally as a result of manual works involving handheld power tools. As these works will occur generally within the structures of the buildings, there will not be a significant noise impact from these activities.

The application of binding noise limits, hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact will have a negative, moderate, and short-term impact on the surrounding environment.

Operational Phase

Additional Vehicular Traffic

The predicted change in noise levels associated with additional traffic is predicted to be of imperceptible impact along the existing road network. In the context of the existing noise environment, the overall contribution of induced traffic is considered to be of neutral, imperceptible, and long-term impact to nearby residential locations.

Mechanical Plant, Retail units & Creche

Noise levels associated with operational plant are expected to be well within the adopted day and night-time noise limits at the nearest noise sensitive properties taking into account the site layout, the nature and type of units proposed and distances to nearest residences. Assuming the operational noise levels do not exceed the adopted design goals, the resultant residual noise impact from this source will be of neutral, Imperceptible, long-term impact.

8.9 'Do Nothing' Scenario

Should the project not proceed there would be no increase in noise emanating from the site and the ambient noise level would remain the same.

8.10 Worst Case Scenario

The 'worst case' scenario is that the development is not constructed as per the drawings and details provided in the planning application. While one would expect the development is required to be constructed in accordance with the planning documents which includes various mitigation measures outlined above.

Daytime average noise levels from the baseline noise survey are in the low-risk category based on the ProPG guidelines. When the development becomes fully operational, due to people walking/running, dogs barking, children playing, mechanical plant, creche and addition vehicular traffic on surrounding roads noise will increase slightly.

The 'worst case' scenario would be that the attributes, mitigation measures were not carried out, the ProPG Internal Noise Levels guidelines, BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings are not met.

8.11 Monitoring & Reinstatement

Construction Phase

It is recommended that monthly noise and vibration monitoring surveys be carried along the boundary of the proposed site in order to monitor the effectiveness of noise and vibration management for the duration of the construction/demolition phases. Noise and vibration levels at Residential Sensitive Locations should not exceed the construction phase noise and vibration limit criteria in Table 8.1 and Table 8.2. Any breaches of these limits will require a review of operations and mitigation measures if the exceedance is due to the construction works on site.

In order to effectively manage noise and vibration at residential dwelling located approximately 20m of the proposed site, installation of continuous data logging live noise and vibration monitoring system is required. This software will require remote login, data download and text/email alert functionality. It will measure key noise and vibration parameters (e.g. L_{Aeq}, L_{AFMAX}, L_{A90}, L_{A10}, PPV(mm/sec) and Frequencies as Hz.

Nature of Effect	Impact	Mitigation	Monitoring
Environmental Impacts during construction process	Possible short term impacts due to disturbance	Compliance with NRA Maximum Permissible Construction Phase Noise Levels at the Façade of Dwellings during	CEMP / CDWMP will be responsibility of construction personnel in liaison with local authority and statutory bodies

Nature of Effect	Impact	Mitigation	Monitoring
		Road Developments and Transient Vibration Impact Criteria for Buildings	
Environmental Impacts during operation process	Will be of neutral, Imperceptible, long-term impact.	Compliance with ProPG Internal Noise Levels	None

Table 8.31: Monitoring

Operational Phase

When the residential development is operational it will not result in an increase in noise and vibration levels at any of the sensitive locations beyond the site boundary therefore no monitoring is deemed necessary going forward.

8.12 Difficulties in Compiling Information

No difficulties were encountered during the preparation of the EIAR chapter.

8.13 References

- Wicklow County Council Noise Action Plan 2024 – 2028
- Environmental Protection Agency (2022), Guidelines on the Information to Be Contained in Environmental Impact Assessment Reports. EPA. Wexford
- European Commission (1999), Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions. European Commission, Luxembourg.
- Health and Safety Authority (2018) Notified Seveso Establishments.www.hsa.ie
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Part 1 - Noise.
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Part 2 -Vibration.
- BS 6841 (1987): Measurement and evaluation of human exposure to whole-body mechanical vibration and repeated shock
- BS 4142: 2014: Methods for Rating and Assessing Industrial and Commercial Sound.
- Design Manual for Roads and Bridges, 2011
- EPA Advice Notes for Preparing Environmental Impact Statements, (Draft, September 2015).

- EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), (EPA, 2003).
- EPA Guidelines on the Information to be contained in Environmental Impact Statements, (EPA, 2002).
- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (2022)
- ISO 1996: 2017: Acoustics - Description, measurement, and assessment of environmental noise.
- The Transport Infrastructure Ireland (TII, formerly NRA) Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes (TII, 2014), the Guidelines for the Treatment of Noise and Vibration in National Road Schemes (TII, 2004) was also considered in the preparation of the assessment. This document sets out noise and vibration limits for the construction/demolition phase which are generally applied by planning authorities to all construction projects.
- The Professional Guidance on Planning & Noise (ProPG), May 2017
- Section 2 of the EPA Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4).

9. Air and Climate

9.1 Introduction

This section of the Environmental Impact Assessment Report has been prepared to identify and assess the potential air quality and climatic impacts associated with the proposed development of lands for mixed use development on "Lands at Kilbride", Arklow, Co. Wicklow during both the construction and operational phases of the development.

The development will consist of 666 no. residential units comprising 578 no. 1-2 storey housing (100 no. 2 beds, 317 no. 3 beds, 161 no. 4 beds) and 88 no. apartments and duplex apartments (24 no. 1 beds, 51 no. 2 beds and 13 no. 3 beds. All residential units will have associated private open space facing north/ south/ east/ west.

The proposal will also include a local centre comprising a creche (c.1095sqm), 3 no. community/medical units, and 3 no. retail units (along with the apartments). Building heights will range from one to five storeys.

The site will provide part of the new regional road is also proposed connecting to the Kilbride Road, and the new access road provided by the "Kilbride Education Campus" along with upgrade works to the Kilbride Road L6179. A boardwalk will be provided across the Arklow town marsh and Avoca River connecting the site to Arklow town.

All associated site development works, site reprofiling, services provision, infrastructural and drainage works, surface water attenuation and natural attenuation systems, connection to public services and utilities, provision of ESB substation, bin stores bicycle stores, car parking, public lighting, landscaping, public and communal open spaces and boundary treatment works.

This proposed development is as described in Chapter 3 (Description of Development) of this EIAR and as set out in the statutory notices.

This document includes a comprehensive description of the existing air quality and climate at and in the vicinity of the subject site, a description of how the construction and operational phases of the development may impact existing air quality and finally; the mitigation measures that shall be implemented to control and minimise the impact that the development may have on local ambient air quality and reduce the impact on the local micro climate.

Statement of Competence

This section of the EIAR has been prepared by Nevin Traynor, of Traynor Environmental Ltd. Nevin Traynor is a Senior Environmental Scientist with Traynor Environmental ; with over 20 years' experience in the environmental sector. His project experience includes the management and productions of Environmental Impact Statements (EISs)/EIARs, particularly within the Commercial/Industrial and Housing Sector.

9.2 Methodology

The general assessment methodology of the potential impact of the proposed development on air quality and climate has been devised in accordance with:

The assessment includes:

- A comprehensive description of the existing air quality in the vicinity of the subject site.

- A description and assessment of how construction/demolition activities and the operation of the development may impact existing air quality.
- The mitigation measures that will be implemented to control and minimise the impact that the development may have on local ambient air quality and reduce the impact on the local micro climate.
- And, finally, a description as to how the development will be constructed and operated in an environmentally sustainable manner.

The general assessment methodology of the potential impact of the project on air quality and climate has been conducted in accordance with:

- Climate Action and Low Carbon Development Act 2015
- The Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (2011)
- Directive 2011/92/EU of the European Parliament and Council of the 13th of December 2011 on the assessment of the effects of certain public and private projects on the environment (codification) as amended by Directive 2014/52/EU of the European Parliament and Council of the 16th of April 2014
- EPA Guidelines on information to be contained in Environmental Impact Statements (2022) (EPA, 2022) (the EPA Guidelines)
- Guidance on the preparation of Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU) (European Commission, 2017) (the EU EIAR Guidance).

Baseline Environment

The existing ambient air quality in the vicinity of the site has been characterised with information obtained from a number of sources as follows:

- EPA Annual Air Quality in Ireland Reports.
- Site specific air quality monitoring.

The ambient air quality data collected and reviewed for the purpose of this study focused on the principal

substances (dust, vehicle exhaust emissions and boiler emissions) which may be released from the site during the construction and operation phases and which may exert an influence on local air quality.

Air Quality Standards and other Relevant Guidance

Air quality standards and guidelines are available from a number of sources. The guidelines and standards referenced in this report include those from Ireland and the European Union.

In order to reduce the risk to health from poor air quality, National and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or “Air Quality Standards” are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (Ref Table 9.1).

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the National Air Quality Standards Regulations 2011 (S.I No. 180 of 2011), which incorporate European Commission Directive 2008/50/EC which has set limit values for the pollutants SO_2, NO_2, PM_{10}, benzene and CO Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC). The Directive is implemented by the Air Quality Standards Regulations 2011 which replace the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and S.I. No. 33 of 1999.

In order to assess a wider range of air pollutants in the development area it is necessary to review current air quality monitoring data from published sources such as the most recent EPA's 2022 Annual report entitled Air Quality in Ireland. This EPA report provides detailed monitoring data collected from a number of monitoring locations throughout Ireland on an annual basis to assess national compliance with National Air Quality Regulations. The location of the site in Arklow, Co. Wicklow it is characterised as a Zone D area as defined by the EPA. Available EIAR climate & air quality characters for neighbouring sites have been reviewed in preparing this EIAR.

EU legislation on air quality requires that Member States divide their territory into zones for the assessment and management of air quality. The zones currently in place in Ireland in are as follows:

- Zone A is the Dublin conurbation
- Zone B is the Cork conurbation
- Zone C comprising 23 large towns in Ireland with a population >15,000.
- Zone D is the remaining area of Ireland.

The air quality in each zone is assessed and classified with respect to upper and lower assessment thresholds based on measurements over the previous five years. Upper and lower assessment thresholds are prescribed in the legislation for each pollutant. The number of monitoring locations required is dependent on population size and whether ambient air quality concentrations exceed the upper assessment threshold, are between the upper and lower assessment thresholds, or are below the lower assessment threshold. A summary of the Air Quality Standards Regulations 2021 is detailed below in Table 9.1.

Pollutant	2008/50/EC Limit Type	2008/50/EC Limit Value (Applicable until 2030)	Directive (EU) 2024/2881 Limit Type	Directive (EU) 2024/2881 Limit Value (To be attained by 2030)
Nitrogen Dioxide (NO_2)	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m^3	Hourly limit for protection of human health - not to be exceeded more than 3 times/year	200 µg/m^3

	n/a	n/a	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	50 µg/m^3
	Annual limit for protection of human health	40 µg/m^3	Annual limit for protection of human health	20 µg/m^3
Particulate Matter (as PM_{10})	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m^3	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	45 µg/m^3
	Annual limit for protection of human health	40 µg/m^3	Annual limit for protection of human health	20 µg/m^3
Particulate Matter (as $PM_{2.5}$)	n/a	n/a	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	25 µg/m^3
	Annual limit for protection of human health	25 µg/m^3	Annual limit for protection of human health	10 µg/m^3

Table 9.1: Air Quality Standards Regulations 2011 (based on EU Council Directive 2008/50/EC)

Pollutant	Limit Type	IT3 (2026)	IT4 (2030)	Final Target (2040)

NO_2	24-hour limit for protection of human health	-	-	25 µg/m^3
	Annual limit for protection of human health	20 µg/m^3		10 µg/m^3
PM (as PM_{10})	24-hour limit for protection of human health	75 µg/m^3	50 µg/m^3	45 µg/m^3
	Annual limit for protection of human health	30 µg/m^3	20 µg/m^3	15 µg/m^3
PM (as $PM_{2.5}$)	24-hour limit for protection of human health	37.5 µg/m^3	25 µg/m^3	15 µg/m^3
	Annual limit for protection of human health	15 µg/m^3	10 µg/m^3	5 µg/m^3

Table 9.2: Air Quality Guidelines 2021

The applicable air quality limit values for the purposes of this assessment are those set out in Table 9.1. The limit values stipulated under Directive 2008/50/EC and the Air Quality Standards Regulations 2022 are applicable for the construction phase and opening year for the proposed development.

Dust levels in urban atmospheres can be influenced by industrial activities and transport sources. There are currently no national or European Union air quality standards with which these levels of dust deposition can be compared. However, a figure of 350 mg/m^2-day (as measured using Bergerhoff type dust deposit gauges as per German Standard Method for determination of dust deposition rate, *VDI 2129*) is commonly applied to ensure that no nuisance effects will result from industrial or construction activities.

Pollutant	EPA 2016 Assessment Classification
NO_2	
Zone A & B	Above lower assessment threshold
Zone C & D	Below lower assessment threshold
SO_2	
Zone A & B	Below lower assessment threshold
Zone C & D	Below lower assessment threshold
CO	
Zone A & B	Below lower assessment threshold
Zone C & D	Below lower assessment threshold
Ozone	

Zone A & B Zone C & D	Below long-term objective Above long-term objective
PM_{10} Zone A & B & C Zone D	 Above lower assessment threshold Below lower assessment threshold
$PM_{2.5}$ Zone A & B Zone C & D	 Below lower assessment threshold Above lower assessment threshold
Benzene Zone A & B Zone C & D	 Below lower assessment threshold Below lower assessment threshold
Heavy Metals (As, Ni, Cd, Pb) Zone A & B Zone C & D	 Below lower assessment threshold Below lower assessment threshold
Poly Aromatic Hydrocarbons (PAH) Zone A & C & D Zone B	 Above lower assessment threshold Above upper assessment threshold

Table 9.3: EPA 2016 Assessment Zone Classification

Construction Impact Assessment Criteria

Transport Infrastructure Ireland's 'Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes' states that "*it is very difficult to accurately quantify dust emissions arising from construction activities*" and that "*it is thus not possible to easily predict changes to dust soiling rates or PM_{10} concentrations.*" The guidance advises the use of a semi-quantitative approach to determine the likelihood of a significant impact which should be combined with an assessment of the proposed mitigation measures.

The construction assessment criteria, reproduced from the NRA guidance, are set out in Table 9.3 below.

Source		Potential distance for significant effects (distance from source)		
Scale	**Description**	**Soiling**	**PM_{10} [a]**	**Vegetation effects**
Major	Large construction sites, with high use of haul routes	100m	25m	25m
Moderate	Moderate sized construction sites, with moderate use of haul routes	50m	15m	15m
Minor	Minor construction sites, with limited use of haul routes	25m	10m	10m

Table 9.4: Assessment criteria for the impact of duct emissions from construction activities with standard mitigation in place (NRA, 2011)

The impact of construction related dust emissions is assessed by estimating the area over which there is a risk of significant impacts as per the NRA guidance.

Climate Assessment Methodology

Climate has implications for many aspects of the environment from soils to biodiversity and land use practices. The proposed development may impact on both the macro-climate and micro-climate. The

macro-climate is the climate of a large geographic area such as Ireland. The micro-climate refers to the climate in the immediate area.

The impact of the proposed scheme upon the macro-climate is assessed through the consideration of the change in CO_2 emissions that will occur due to the changes in traffic flow that occur in response to the proposed scheme.

Conference of the Parties

The Conference of the Parties to the Convention (COP28) occurred in Glasgow in November 2021 with the following outcomes. The 2023 United Nations Climate Change Conference or Conference of the Parties of the UNFCCC, more commonly known as COP28 was the 28th United Nations Climate Change conference, held from 30 November until 12 December at Expo City, Dubai, United Arab Emirates. The COP conference has been held annually (except 2020 due to the COVID-19 pandemic)since the first UN climate agreement in 1992. They are intended for governments to agree on policies to limit global temperature rises and adapt to impacts associated with climate change

Emissions

In order to prevent the worst outcome of climate change, while also "accelerating action in this critical decade, so as to achieve net zero by 2050 in keeping with the science" also called for a tripling of global renewable energy capacity by 2030, the development of numerous "zero- and low-emission technologies", further efforts "towards the phase-down of unabated coal power" and a cut in methane emissions.

Reaffirming the Paris Agreement

Prior to the summit, some nations opposed to stronger action had criticised the focus at COP28 on 1.5C as 'reopening the Paris agreement'. The main goal of which is to hold temperature rises 'well below' 2C above pre-industrial levels while 'pursuing efforts' to limit rises to 1.5C.

European Commission Directive 2001/81/EC, the National Emissions Ceiling Directive (NECD) (2014), prescribes the same emission limits as the 1999 Gothenburg Protocol. A National Programme for the progressive reduction of emissions of these four transboundary pollutants has been in place since April 2005 (DEHLG, 2007a; 2004). Data available from the EU in 2010 indicated that Ireland complied with the emissions ceilings for SO_2, VOCs and NH_3 but failed to comply with the ceiling for NO_X (EEA,2012). Directive (EU) 2016/2284 "on Reduction of National Emissions of Certain Atmospheric Pollutants and Amending Directive 2003/35/EC and Repealing Directive 2001/81/EC" was published in December 2016. The directive will apply the 2010 NECD limits until 2020 and establish new national emission reduction commitments which will be applicable from 2020 and 2030 for SO_2, NO_X, NMVOC, NH_3, $PM_{2.5}$ and CH4. In relation to Ireland, 2020-29 emission targets are for SO_2 (65% below 2005 levels), for NO_X (49% reduction), for VOCs (25% reduction), for NH_3 (1% reduction) and for $PM_{2.5}$ (18% reduction). In relation to 2030, Ireland's emission targets are for SO_2 (85% below 2005 levels), for NO_X (69% reduction), for VOCs (32% reduction), for NH_3 (5% reduction) and for $PM_{2.5}$ (41% reduction).

The following guidelines and EU Directives relating to Climate Change aspects of EIA reports have been applied to this assessment in order to determine the potential impacts/effects that the proposed development may have on climate change.

- EPA Guidelines on information to be contained in Environmental Impact Assessment Reports 2022
- European Union (Planning & Development) (Environmental Impact Assessment) Regulations 2018 (SI No. 296 of 2018)
- Directive 2011/92/EU of the European Parliament and Council of the 13th December 2011 on the assessment of the effects of certain public and private projects on the environment (codification) as amended by Directive 2014/52/EU of the European Parliament and Council of the 16th April 2014 The Irish Building Regulations Technical Guidance Document L - Conservation of Fuel & Energy – Dwellings amended in 2017 includes requirements for all residential dwelling to be "Nearly Zero Energy Buildings" (NZED's) by 31st December 2020.
- Irelands National Energy and Climate Plan 2021 – 2030.

In order to meet the commitments under the Paris Agreement, the EU enacted Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013 (the Regulation). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. Ireland's obligation under the Regulation is a 30% reduction in non-ETS greenhouse gas emissions by 2030 relative to its 2005 levels.

Climate Action and Low Carbon Development Act 2015

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the 2015 Act). The purpose of the Act was to enable Ireland 'to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050' (section 3(1) of the 2015 Act. This is referred to in the Act as the 'national transition objective.' The Act made provision for, inter alia, a national adaptation framework. In addition, the Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations. The 2015 Act was amended by the Climate Action and Low Carbon Development (Amendment) Act 2021 (the 2015 Act as amended).

The key duty imposed on planning authorities by section 15 of the Climate Action and Low Carbon Development Act 2015 (as amended) is:

A relevant body [e.g., a planning authority] shall, as far as practicable, perform its functions in a manner consistent with

a) the most recent approved climate action plan,
b) the most recent approved national long term climate action strategy,
c) the most recent approved national adaptation framework and approved sectoral adaptation plans,
d) the furtherance of the national climate objective, and
e) the objective of mitigating greenhouse gas emissions and adapting to the effects of climate change in the state."

2024 Climate Action Plan

The 2024 Climate Action Plan (CAP) was published by the Irish Government in December 2023 (Government of Ireland, 2023). The Climate Action Plan 2024 outlined the current status across key

sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets.

Wicklow Climate Action Plan 2024 - 2029

The Climate Action Plan for Wicklow was developed by Wicklow County Council (WCC) under the guidance of the Climate Action Regional Office (CARO). This plan has eight strategic goals which will ensure a coherent approach to transforming the organisations delivery of service, a focus on measurable reduction in emissions and engagement of key stakeholders in the delivery of climate action. The eight goals are based on the objectives of the Delivering Effective Climate Action 2030 and are listed as follows:

1. Adopt climate focused governance, provide leadership and build partnerships for climate action.
2. Achieve carbon emissions reduction of 51% and energy efficiency improvement of 50% in our operations by 2030, creating a pathway to net zero by 2050.
3. Deliver on climate adaptation, biodiversity resilience and enhanced capacity for our environment to adapt to changing conditions.
4. Mobilise and empower climate action in local communities.
5. Mobilise climate action in enterprise and agriculture, supporting the transition to an inclusive, net zero and circular economy.
6. Achieve a 'just transition' particularly for communities that may be economically disadvantaged by decarbonising projects or impacted by climate change.
7. Support decarbonisation of transport and modal shift from cars to active travel and public transport.
8. Test the scope and scale of decarbonisation in Arklow with the aim of creating a vibrant town which has low carbon living at its core.

Climate Change Advisory Council

The Climate Change Advisory Council submitted their Annual Review 2023 to the Minister of the Environment, Climate and Communications on 21st of July 2023. Detailed key messages, including observations and recommendations for each sector (electricity; transport; built environment; enterprise and waste; agriculture, forestry and other land use; and biodiversity), can be found at the beginning of each chapter in the annual review. The overall recommendations are as follows:

- Government needs to identify and remove barriers to policy implementation by ensuring adequate funding and planning reform at scale and speed.
- Key actions need to be implemented now to prevent longer term drainage and increased costs to society and the economy.
- Government must adopt new approaches to address emission reductions, creating investment and enhancing skills across the economy, particularly in areas such as retrofitting and renewable energy.
- The establishment of a Just Transition Commission is recommended to ensure that Ireland achieves its climate objectives in a way that is fair and equitable and protects vulnerable people and communities; and
- The Government should support opportunities that reduce emissions and make Ireland better prepared for the impacts of climate change.

Ireland's Greenhouse Gas Emissions

Ireland's greenhouse gas (GHG) emissions increased in the period from 1990 to 2001 where it peaked at 71.81 Mt CO2 equivalent, before displaying a downward trend to 2014. Emissions increased by 4.2% and 3.7%, respectively in the years, 2015 and 2016 and remained relatively stable in 2017 and

2018, followed by a 4.1% decrease in 2019. In 2020 final estimates of total national GHG emissions amounted to 58.94 Mt CO2 equivalent, which is 3.5% lower than 2019 emissions largely driven by the covid restrictions. The gradual lifting of covid restrictions in 2021 along with an increase in the use of coal and less renewables within electricity generation resulted in a 5.1% increase in emissions in 2021 compared to 2020. A 1.9% increase in emissions was seen in 2022 compared to 2021, mainly due to a substantial decrease in residential sector emissions combined with decreases from industry, agriculture and electricity generation. Ireland's GHG emissions have increased by 9.2% from 1990-2022.

In relation to the greenhouse gases, carbon dioxide (CO2) accounted for 60.4% of the total, with methane (CH4) and nitrous oxide (N2O) contributing 29.0% and 9.4% as CO2 equivalent, respectively and F-gases contributing 1.2% of the total as CO2 equivalent. In 2022, the energy industries, transport and agriculture sectors accounted for 74.1% of total GHG emissions. Agriculture is the single largest contributor to the overall emissions, at 38.4%. Transport, energy industries and the residential sector are the next largest contributors, at 19.1%, 16.6% and 10.0%, respectively.

9.3 Receiving Environment

Description of the Baseline Environment/Context

The site is located in the area of Kilbride on the northern side of the Avoca River. The site is bounded by the town marsh to the south, M11 to the west, housing at Avondale Crescent / Murell Drive and St. Josephs School to the east and the Kilbride Industrial estate and Kilbride Road L-6179 to the north. The site slopes in a broadly north / south direction to the town marsh and Avoca River.

The development area is located within a zone which includes a significant sources of transportation related air emissions principally from the M11 Motorway, R772 and local road infrastructure. It is noted that there are no major sources of industrial air emissions within 3km of the site.

Description of Existing Climate

The nearest representative synoptic meteorological station to the subject site is at Oak Park which is located approximately 50km northwest of the site and as such, long-term measurements of wind speed/direction and air temperature for this location are representative of prevailing conditions experienced at the subject site. Recent meteorological data sets for Oak Park were obtained from Met Éireann for the purposes of this assessment study. The existing air quality environment is therefore principally defined by traffic from the M11, R772 and the local road infrastructure. Fuel combustion for space heating for commercial activities and residential developments also contributed to the ambient air quality.

Rainfall

Precipitation data from the Oak Park meteorological station for the period 2018-2022 indicates a mean annual total of about 844.48 mm. This is within the expected range for most of the eastern half of the Ireland which has between 750mm and 1000 mm of rainfall in the year.

Temperature

The annual mean temperature at Oak Park (2015-2024) is 10.5ºC. Given the relatively close proximity of this meteorological station to the proposed development site, similar conditions would be observed. Table 9.4 sets out meteorological data for Oak Park from 2015-2024.

Year	Period	Rainfall (mm)	Mean Temperature (ºC)
2020	Annual Mean	910	10.3
2021	Annual Mean	851	10.4

2022	Annual Mean	841	10.7
2023	Annual Mean	937	11.1
2024	Annual Mean	778	10.5
Mean		**863.4**	**10.6**

Table 9.5: Meteorological Data for Oak Park 2015-2024

Note 1: Data supplied by Met Eireann

Wind

Wind is of key importance for both the generation and dispersal of air pollutants. The Windrose for Oak Park during five representative years (2020-2024) as presented below in Figure 9.1 indicates the prevailing wind direction in the Carlow area. The mean annual wind speed in the Oak Park area is approximately 7.2 m/s.

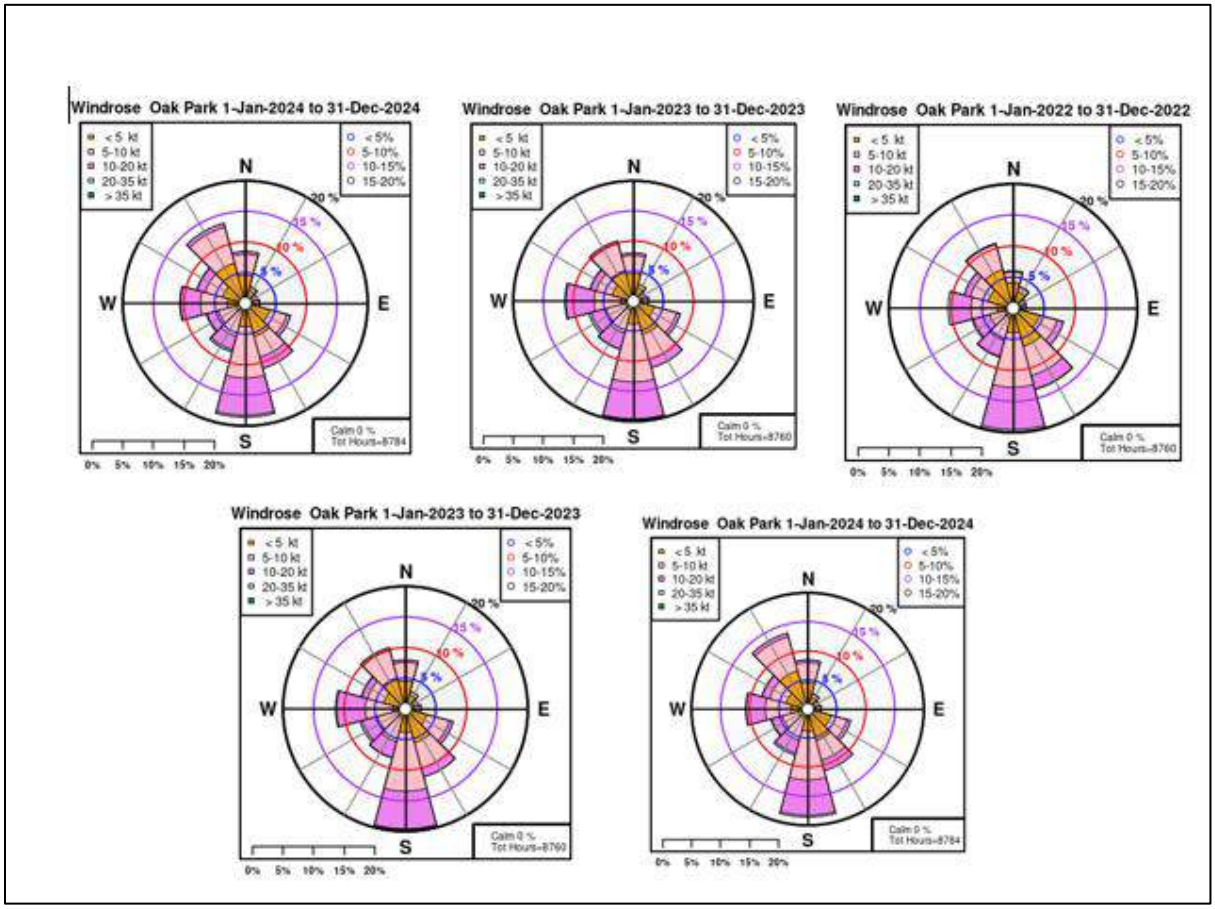


Figure 9.1: Windrose for Oak Park 2020-2024

Description of Existing Air Quality

The existing ambient air quality at and in the vicinity of the site is typical of an out of city urban location and as such, domestic and commercial heating sources and road traffic are identified as the dominant contributors of hydrocarbon, combustion gases and particulate emissions to ambient air quality.

Trends in Air Quality

Annual air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality 'Air Quality in Ireland 2022 (Published 2023) details the range and scope of monitoring undertaken throughout Ireland. The Arklow area is categorised as Zone D.

The most recent 2022 EPA publication includes a number of Zone monitoring locations which would be comparable to the expected air quality at the subject site. The various Zone D air quality monitoring stations within Ireland provide a comprehensive range of air quality monitoring data sets which have been selected as part of this assessment to describe the existing ambient air quality at the subject site.

Nitrogen Dioxide

The Air Quality Standards Regulations 2011 specify a limit value of 40 µg/m3, for the protection of human health, over a calendar year. The standard, taken from the 2008 CAFÉ Directive 2000/69/EC, came into force in 2011.

Long term NO2 monitoring was carried out at 6 Zone D locations in 2022. The NO2 annual mean for these sites ranged from 3.3 – 12.4 µg/m3 compared against the annual average limit of 40 µg/m3.

Sulphur Dioxide

The Air Quality Standards Regulations 2011 specify an annual limit value of 20µg/m3 for the protection of human health. The standard, taken from the 2008 CAFÉ Directive 2000/69/EC, came into force in 2011.
Long term SO2 monitoring was carried out at 5 Zone D locations in 2022. The annual SO2 daily means in 2022 for these sites ranged from 2.1 – 8.3 µg/m3.

Carbon Monoxide

The Air Quality Standards Regulations 2011 specify an 8-hour limit value (on a rolling basis) for the protection of human health of 10,000 µg/m3. The standard, taken from the 2008 CAFÉ Directive 2000/69/EC, came into force in 2011.
Long term CO monitoring was carried out at 1 Zone D location in 2022. The 8-hour CO concentrations was 800µg/m3 which is below the 8-hour limit value (on a rolling basis) of 10,000 µg/m3.

Particulate Matter PM_{10}

The Air Quality Standards Regulations 2011 specify a PM10 limit value of 40 µg/m3 over a calendar year. The standard, taken from the 2008 CAFÉ Directive 2000/69/EC, came into force in 2011.
Long term PM10 monitoring was carried out at 16 Zone D locations in 2022. The PM10 annual mean in 2022 for these sites ranged from 7.9 – 15.0µg/m3.

Particulate Matter $PM_{2.5}$

The Air Quality Standards Regulations 2011 specify a PM2.5 limit value of 25 µg/m3 over a calendar year.
Long term PM2.5 monitoring was carried out at 16 Zone D locations in 2022. The PM2.5 average in 2022 for these sites ranged from 5.6 – 13.4µg/m3.

Benzene

The Air Quality Standards Regulations 2011 specify a benzene limit value of 5 µg/m3 over a calendar year. The standard, taken from the 2008 CAFÉ Directive 2000/69/EC, came into force in 2011. Long term benzene monitoring was carried out at one Zone D location. The benzene average in 2022 for this site was 0.21 µg/m3. Therefore, long term averages were below the limit value 5 µg/m3
Table 8-5 below presents a summary of the 2022 Air Quality data obtained from the Zone D which may be considered to be broadly similar to that of the subject site in which the subject development site is located.

Table 9.5 below presents a summary of the 2021 Air Quality data obtained from the Rural Area Zone D which may be considered to be broadly similar to that of the subject site in which the subject development site is located. Indeed, it is expected that the air quality at the subject site will be of a higher quality as it is further removed from the monitoring locations within the Wicklow Rural Area.

Pollutant	Regulation	Limit type	Limit value	EPA monitoring data 2020
Nitrogen dioxide	2008/50/EC	Annual limit for protection of human health	40 µg/m^3	3.3 – 12.4µg/m^3
Sulphur dioxide	2008/50/EC	Daily limit for protection of human health (not to be exceeded more than 3 times per year)	125 µg/m^3	2.1 – 8.3µg/m^3
Carbon monoxide	2008/50/EC	8-hour limit (on a rolling basis) for protection of human health	10,000 µg/m^3	800 µg/m^3
Particulate matter (as PM_{10})	2008/50/EC	Annual limit for protection of human health	40 µg/m^3	7.9 – 15.0µg/m^3
Particulate matter (as $PM_{2.5}$)	2008/50/EC	Annual limit for protection of human health	25 µg/m^3	5.6 – 13.4µg/m^3
Benzene	2008/50/EC	Annual limit for protection of human health	5 µg/m^3	0.21µg/m^3

Table 9.6: Summary of the 2015 Air Quality data obtained from the Dublin Zone D

Baseline Air Quality Monitoring

A site-specific short-term monitoring study was conducted for Nitrogen oxides, Sulphur dioxide and BTEX and Particulates (Benzene, Toluene, Ethylbenzene and Xylene). All pollutants were measured at the boundary locations (AQM1, AQM3, AQM7, AQM10 and AQM13) using passive diffusion tubes over a two-week period. Figure 9.1 identifies the monitoring locations. The baseline survey was conducted during January 2019 when the potential for higher ambient levels of fossil fuel generated pollutants would be at a maximum.

These locations were chosen in order to obtain short-term sample concentrations for the identified parameters from the principal sources of pollution i.e. vehicle exhaust emissions and home heating emissions. The survey was indicative only and results obtained cannot be used to demonstrate compliance with short-term or annual limit values detailed in Table 9.5 above. The survey does, however, aid in identifying the influence of sources in the vicinity of the proposed development site. The results from the monitoring surveys are presented in Table 9.6.

The concentrations of NO_2, SO_2 and Benzene measured during the short-term measurement survey were significantly below their respective annual limit values and comparable with levels reported by the EPA.

Pollutant	Sample Period	Concentration µg/m^3					Criteria (Annual limit)
		Air Quality Monitoring Locations					
		AQM 1	AQM 3	AQM 7	AQM 10	AQM 13	
Nitrogen dioxide	02.12.24 – 16.12.24	<5	<4	<4	<4	<4	40 µg/m^3(as annual average)
Sulphur dioxide	02.12.24 – 16.12.24	<3	<3	<3	<3	<3	125 µg/m^3(as annual average)
Benzene	02.12.24 – 16.12.24	<2	<2	<2	<2	<2	10 µg/m^3(as annual average)

Ethylbenzene	02.12.24 – 16.12.24	<2.5	<3	<3	<3	<3	N/A
Toulene	02.12.24 – 16.12.24	<9	<9	<9	<9	<9	N/A
m/p-Xylene	02.12.24 – 16.12.24	<3	<3	<3	<3	<3	N/A
o-Xylene	02.12.24 – 16.12.24	<2	<2	<2	<2	<2	N/A

Table 9.7: Results of passive diffusion tube monitoring at the proposed development site.

Note 1: < value indicates below Laboratory limit of detection

Figure 9.2: Baseline Air Quality Monitoring Locations AQM1 TO AQM15 Dust Levels Tested with DustTrak II Aerosol Monitor 8530.

AQM Location	Total Particulates mg/m³/day
AQM1	0.015
AQM2	0.016
AQM3	0.019
AQM4	0.015

AQM5	0.020
AQM6	0.018
AQM7	0.016
AQM8	0.018
AQM9	0.019
AQM10	0.019
AQM11	0.021
AQM12	0.027
AQM13	0.018
AQM14	0.019

Table 9.8: Total Particulates measured onsite

Significance

Based on published 2022 EPA air quality data for the Zone D area in which the subject site is located together with site specific monitoring data, it may be concluded that the existing baseline air quality at the subject site may be characterised as being good with no exceedances of the National Air Quality Standards Regulations 2011 (S.I No. 180 of 2011) limit values of individual pollutants. There is therefore currently sufficient atmospheric budget to accommodate the development without adversely impacting existing ambient air quality. The quality of existing air quality at the subject site must be maintained and improved where possible as a result of the proposed development to ensure that local human health and the receiving environment is not adversely affected.

Sensitivity

The subject site shall be developed by ground clearance and site preparation works and the subsequent construction of residential units, a creche, retail/nonretail units, roads, open spaces and landscaped areas.

9.4 Characteristics of the Proposed Development

The proposed mixed use Large scale Residential Development will result in the demolition of an existing dwelling and 2 no. sheds/outbuildings and the construction of 666 no. residential units with a mix of semidetached and terraced houses along with duplex apartments and apartments. These will comprise 1, 2, 3 and 4 bed units. All residential units will have associated private open space facing north/ south/ east/ west. The proposal will also deliver a local centre containing 3 no. retail units, 3 no. community/ medical units and 1 no. creche unit.

A new pedestrian/ cyclist link is provided via a new boardwalk and bridge across the marsh and over the Avoca River adjoining the existing greenway and the Main Street. A new road providing vehicular access is also proposed connecting to the north to Kilbride Road along with road improvements in the surrounding area.

The development will also provide for landscaping, public open spaces and all associated site development works to enable the development including boundary treatments, attenuation storage area and other service provision including ESB works.

9.5 Potential Impacts

Predicted Impact

Various elements of both the construction and operational phases of the proposed development have the potential to impact on the local receiving environment, on adjacent residential properties and on

human health. The likely potential impacts for both construction and operation of the proposed scheme prior to mitigation are described in this section of the EIAR.

Construction Phase

The development of the site will be conducted in the following phased stages:

- Enabling works - Site set up and Site clearance
- Construction works including site infrastructure, house building and landscaping
- Construction impacts associated with both of these phased stages are considered below.

Enabling Works – Site Set Up and Clearance

Works activities associated with the 'Site set up' will be undertaken prior to construction works commencing in each sub-phase. The setting up of the site shall involve the construction of site security hoarding and site compounds, site offices, materials and waste storage areas and staff welfare facilities. These temporary activities will have a minimal potential to generate fugitive dust emissions or combustion gas emissions.

Site clearance and ground excavation works will be undertaken in separate phases and these activities have the potential to generate fugitive windblown dust emissions rising from the operation of mechanical plant such as dozers, excavators and tipper trucks and the movement of these vehicles on exposed surfaces at the site. With regard to the phased development approach, only one phase at a time shall be developed with the remaining phased areas remaining generally undisturbed until such a time as they are developed. Infrastructural works will be required to facilitate site services but it is not predicted that there would be bulk excavations of stripped soils until such a time as the development of subsequent phases are commenced.

With regard to the volume of waste material (top and sub soils) generated during site clearance, there will be a requirement for HGV trucks. Topsoil's shall be stockpiled and covered on site for re-use during final landscaping works. Trucks shall be loaded with material on-site by mechanical excavators and loading shovels which will generate fugitive dust emissions as a result of the transfer of the excavated materials comprised principally of soils and stones from stockpile to truck. The movements of construction vehicles on the site shall also generate windblown dust emissions. Where dusty waste material is loaded onto exposed open trucks, fine dusts may be released as the truck travels along public roads.

The impact on local air quality during Site Set Up and Clearance will be temporary in nature and will result in a potentially minor impact on local air quality and sensitive receptors provided that all mitigation measures are implemented. Stockpiled topsoil's shall be covered to prevent their erosion and shall eventually be re-used in landscaping works on the site.

Building and Site Infrastructure Construction Works

The development relates to the construction of residential units in a mix of apartments and houses, local centre comprising a creche, 3 no. community/medical units, and 3 no. retail units car parking and landscaping. The proposal includes for internal roads and streets along with appropriate hard and soft landscaping treatments.

During the construction phase there will be extensive site works, involving construction machinery, construction activities on site which have the potential to generate fugitive windblown dust emissions.

Construction equipment including generators and compressors will also give rise to some exhaust emissions. However, due to the size and nature of construction activities, exhaust emissions during construction will have a negligible impact on local air quality.

Construction traffic to and from the site shall result in a short-term increase in the volume of diesel fuelled HGVs along the local road network which will generate additional hydrocarbon and particulate emissions from the vehicle exhausts. However, the activities detailed above will result in an imperceptible impact on local air quality and sensitive receptors.

Climate

During the construction phase, existing vegetated areas throughout the development site will be removed due to site clearance works and associated movement of construction traffic thus impacting the micro-climate. Whilst this will impact the evapotranspiration rates of vegetation, there will be no impact upon the moisture evaporation from the exposed soil. Therefore, there will be no significant impacts on microclimate.

CO2 will be released into the atmosphere as a result of the movement of construction vehicles and use of plant. However, emissions associated with such activities will occur over a short-term period (c. 3 years) which will not result in an adverse impact on the local micro or the broader macro climate.

Construction Impacts – Permanent

The permanent predicted impacts are as described above for construction impacts interim.

Operational PhaseAir Quality

The operational phase of the proposed development will result in a slight, long term impact on local air quality primarily as a result of the requirements of new buildings to be heated and with the increased traffic movements associated with the development.

Traffic movements associated with the development have been evaluated and assessed as part of the Traffic Impact Assessment for the development which will include parking for vehicles which will enter and exit the site. The am and pm peak traffic movements will not result in an adverse impact on local air quality at any of the junctions and it is predicted that the impact of car engine exhaust emissions will have a negligible impact on local ambient air quality.

The design and construction of all buildings in accordance with National Building Regulations shall ensure that modern building materials are used and that they are designed to be thermally efficient resulting in a reduction in the volume of fossil fuels required to heat the buildings. It is predicted that fossil fuel combustion gas emissions including Carbon Dioxide, Sulphur Dioxide, Nitrogen Oxides, Carbon Monoxide and hydrocarbon particulate emissions will be slight and will not have an adverse significant impact on the existing ambient air quality in the vicinity of the proposed development site.

Energy Efficiency - All proposals for development shall seek to meet the highest standards of sustainable design and construction with regard to the optimum use of sustainable building design criteria such as passive solar principles and also green building materials. In order to reduce energy consumption, the following key design considerations have been considered in the design process and will be incorporated into the construction of the residential units, where feasible:

- Passive solar design including the orientation, location and sizing of windows
- The use of green building materials: low embodied energy & recycled materials
- Energy efficient window units and frames
- Building envelope air tightness
- Installation of Heat Recovery & Ventilation systems in all apartment units which operate by extracting warm air from kitchens and bathrooms, cleaning it and distributing it to other rooms in the unit.

Climate

The site area will include open space and landscaped areas. The overall development includes the construction of buildings and roadways will have the effect of marginally raising local air temperatures, especially in summer. Therefore, it is predicted that the proposed development will not have an adverse impact on micro-climate at the nearest residential properties or on the local receiving environment in the vicinity of the site boundaries.

The proposed development includes structures which may impact on the local micro-climate by means of wind shear effects. Greenhouse gases occur naturally in the atmosphere (e.g. carbon dioxide, water vapour, methane, nitrous oxide and ozone) and in the correct balance, are responsible for keeping the lower part of the atmosphere warmer than it would otherwise be. These gases permit incoming solar radiation to pass through the Earth's atmosphere, but prevent most of the outgoing infrared radiation from escaping from the surface and lower atmosphere into the upper levels. However, human activities are now contributing to an upward trend in the levels of these gases, along with other pollutants with the net result of an increase in temperature near the surface.

Motor vehicles are a major source of atmospheric emissions thought to contribute to climate change, however, vehicle exhaust emissions generated from site related vehicles will have a negligible impact on the macro-climate given modern technological developments in cleaner and more efficient vehicle engines.

The scheme has been designed to provide thermally efficient buildings which will reduce the consumption of fossil fuels within each individual dwelling. This will reduce the impact the operational phase of the development will have on the micro and macro climate. In particular, there will be no "traditional" passive air vents in the proposed new buildings which are both thermally and acoustically inefficient and if possible, Mechanical Ventilation and Heat Recovery (MVHR) systems shall be incorporated into the design of the builsings. The MVHR systems together with thermally and acoustically rated window sets will reduce the potential future impacts that the external climate will have in terms of wind and changing temperatures on the internal environment within the residential units. These design features will ensure the units are thermally efficient thus reducing the use of fossil fuels leading to a reduction of the impact on climate.

The thermal efficiency of the buildings will ensure that the development will be sustainable and will be protected against the impacts of future climate change which can include high winds, storm events and prolonged colder periods during the winter season.

The EPA's Integrated Pollution Prevention and Control (IPPC) Licensing Application Guidance Notes, 2012 define the threshold of boiler emissions for the categorisation of major ot minor emissions. As a genreal rule, gas boilers over 5 MW are regarded to be significant and categorised as a major emission. There will be no gas boilers in excess of 5MW on this site. Therefore, the impact will be long-term, localised, neutral, and imperceptible.

9.6 Potential Cumulative Impacts

In accordance with The Planning and Development Regulations 2001 as amended, this section has considered the cumulative impact of the proposed development in conjunction with future and current development in the vicinity of the subject site. This section relates to the cumulative impact on the subject site itself and on surrounding sites.

The European Commission's report of May 1999 'Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions' defines cumulative impact as follows:

"Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project."

Construction Phase

The cumulative air quality impact of the existing residential/commercial developments, under construction developments and existing local transport infrastructure together with the proposed development is assessed with regard to having established the baseline air quality and then predicting the impact that the proposed development will have on the baseline air quality. Together the combined impact can be assessed to determine if there is sufficient "atmospheric capacity" to facilitate the proposed development.

It is predicted that the cumulative impact of the construction and operational phases of the proposed development and proposed or permitted neighbouring developments will not have an adverse long-term impact on the receiving environment.

Planning Application Details		Development Description
Planning Reference	22213	construction of a new educational campus and a new link road that will servce the school campus which will include the provision of two school buildings. Gaelscoil an Imbhir Mhóir a two-storey, 16 classrooms primary school with two special needs rooms and ancillary spaces with total floor of circa 3093sqm serving 480 pupils. Gaelshólaiste na Mara a three-storey, post primary school with two special needs rooms, PE hall and ancillary spaces with a total floor area of circa 6585sqm serving 400 pupils. Proposed site works to include the construction of all new hard play areas, six play-courts, grass pitch, 182 no. car-parking spaces together with boundary treatment, 79 bicycle stands, ancillary infrastructure works, pedestrian links and landscaping.
Status	Granted	
Location	Kilbride Educational Campus, Kilbride,	
Planning Reference	ABP 302556 18	Construction of a new wastewater treatment plant, interceptor sewers including storm water overflows and stormwater storage, sea outfall pipelines, and an upgrade to a section of the coastal revetment all in the townlands of Arklow, Tinahask Lower and Ferrybank, County Wicklow.
Status	Granted	
Location	Arklow, Co.Wicklow	
Planning Reference	24325	a 7-year permission for a Large-Scale Residential Development. The proposed development will consist of the following: Construction of 476 no. residential units, Communal open space and public open space in the form of 13 no. local parks. Provision of 930 no. car parking spaces, 400 no. bicycle parking spaces for residents and 37 no. visitor bicycle parking spaces. Construction of a three-storey mixed use building which will consist of 2 no. Retail units at ground floor level, a community centre and office space at first floor level and the previously
Status	Granted	
Location		

		mentioned 2 no. two bed-bedroom apartment and 2 no. three bedroom at second floor level. 48 no. car parking spaces & 20 bicycle parking spaces are also proposed for this building. Construction of a two storey Childcare Facility. Temporary upgrade works to the existing Railway bridge to facilitate vehicular access to the proposed development. Construction of part of the Port Access Road, with a temporary junction at its Junction/connection with the proposed northern arterial route/link road including pedestrian and cycle paths, and traffic calming measures. The provision of vehicular access, internal roads, pedestrian and cycle paths to the Community and Education lands. All associated site development works, services provision, infrastructural and drainage works, surface water attenuation & natural attenuation systems, connection to public services and utilities, provision of ESB substations, bin stores, bicycle stores, car parking, public lighting, landscaping, open spaces, and boundary treatment works
Planning Reference	23756	84 no. residential units with a mix of detached, semi-detached, terraced houses and duplex apartments ranging in height from 2 to 3 storeys; comprising of 8 no. 1-bed and 8 no. 2-bed duplex apartments, 10 no. 2-bed houses and 60 no. 3-bed houses; all residential units will have associated private open spaces facing north/south/east/west; alterations to Kilbride Road (L6179) to provide a section of the new road into the wider Kilbride Masterplan lands with vehicular, pedestrian and cycle access provided; a new dedicated pedestrian and cyclist access will also be provided to the south-east of the development connecting via the Marshland's sports club lands, and through Avondale Crescent to the Dublin Road; landscaping, public open spaces and all associated site development works to enable the development including boundary treatments, attenuation storage area and other service provision
Status	Granted	
Location	Lands at Kilbride, Arklow, Co. Wicklow	
Planning Reference	2484	demolition of existing derelict buildings (1292 sqm); construction of 99 residential units comprising 59 no. apartments with four blocks, ranging in height from 4 to 7 storeys (7 no. 1 bed units, 42 no. 2 bed units and 10 no. 3 bed units) and 40 no. 3 storey houses (20 no. 4 bed units); construction of a 350 sqm mixed use building of
Status	Granted	
Location	Upper Main Street, Arklow, Co. Wicklow	

		four storeys containing 350 sqm of retail space at ground floor and residential units above; refurbishment, extension and change of use from a derelict two storey house to a 146.3 sqm creche; refurbishment of the former Ormonde Cinema (Record of Protected Structure Ref. A39) for commercial use comprising 322.5 sqm office at first floor and 32 sqm office, 181 sqm lounge/café and 59 sqm café uses at ground floor; relocation of a Victorian letterbox (Record of Protected Structure Ref. A40) within the scheme; provision of public open space including a new amphitheatre, a new plaza, communal and private open space; provision of internal access roads with vehicular, pedestrian and cyclist access and new vehicular access onto Upper Main Street; 169 no. car parking spaces and 196 no. bicycle parking spaces provided at basement and surface level; realignment of Coomie Lane to create a new pedestrian links between Vale Road, Upper Main Street and the River Avoca walkway; all associated and ancillary site development works above and below ground, including signage, 2 no. ESB substations, alteration to existing landscape features, play area, sculpture, retaining walls, clearance works, landscaping, excavation, bin stores, boundary treatments and services provision
Planning Reference	24352	Part 8 - to construct 74 No. Social Housing Units and all associated works. The accommodation shall consist of the following: 2 No. four bedroom storey and a half units, 17 No. three bedroom two storey units, 45 No. two bedroom two storey units, 2 No. one bedroom apartments in a two-storey unit and 8 No. one bedroom single storey units.
Status	Granted	
Location	Tinahask, Townland of Tinahask Upper, Arklow, Co. Wicklow	
Planning Reference	2460284	Discount Foodstore Supermarket with ancillary off-licence sales on an extended site. The proposed development comprises: 1) The demolition of existing single storey Discount Foodstore (with ancillary off-licence use) measuring c. 1,357 sqm gross floor space with a net retail sales area of c. 985 sqm; 2) The demolition of existing 1 no. two storey and 2 no. single storey commercial buildings measuring c. 1,191 sqm overall and associated and ancillary site clearance of former Healy Premises; 3) The construction of a single storey Discount Foodstore Supermarket with ancillary off-licence use (and mezzanine plant deck)
Status	Granted	
Location	Lidl, Wexford Road,Arklow, Co. Wicklow, Y14 HY80	

		measuring c. 2,290 sqm gross floor space with a net retail sales area of c. 1,452 sqm.
Planning Reference	24285	Construction of 3 no. detached houses with new access entrance and connection to existing services.
Status	Granted	
Location	Knockenrahan Upper, Wexford Road, Arklow, Co. Wicklow	
Planning Reference	23843	The proposed development includes an amendment to the development permitted under Reg. Ref. 21/1080; The proposed development will consist of the following to facilitate the above. Demolition of the existing structures on the western part of the site that comprises 4 no. industrial commercial buildings, an associated hut / outbuilding, a gas enclosure, and a tank with bund wall. The removal of the remains of a previously demolished building, areas of hard standing, and existing surface treatments. The relocation of the Energy Centre 1 to the western part of the site, which will supersede the previously permitted 110kV GIS substation compound at that location under ABP Ref: VA27.309252. The proposed development will provide for a revised energy centre design, to include the provision of 8 no. gas turbines (with associated flues of 25.15m in height), 4 no. black start emergency generators and associated transformers, 2 no. single storey fuel oil pump rooms with a gross floor area (GFA) of 90.17sq.m, a single storey air compressor building with a GFA of 88.9sq.m, 4 no. fuel tanks, 2 no. MCC control rooms with a GFA of 44.17sq.m, 3 no. fire water tanks, a single storey welfare, storage, and pump room building with a combined GFA of 160.97 sq.m, a two storey MV /LV building with a GFA of 655.54sq.m, 8 no. 11kV/ 33kV step-up transformers in the north of the site, water treatment equipment, and a security hut, all within a fenced compound.
Status	Granted	
Location	Site at Avoca River Park, Arklow, Co. Wicklow	
Planning Reference	23381	Demolition of the existing three storey detached office building (646 sqm) and single storey outbuilding (30 sqm); and the construction of a new five storey apartment block (3,196 sqm GFA) comprising of 34 No. apartments (14 No. one-bed apartments and 20 No. two-bed apartments)
Status	Granted	
Location	Arklow Shipping premises, North Quay, Arklow, Co Wicklow	
Planning Reference	2372	The proposed development consists of the following: Demolition of the existing structures
Status	Granted	

Location	Site located at Avoca River Park, Arklow, Co. Wicklow	on site (industrial structures and outbuildings) and site clearance works; construction of 3 no. three storey information and communication technology (ICT) facility buildings, each with a gross floor area (GFA) of c. 16,206 sq.m (c. 48,618sq.m GFA in total), and with a parapet height of c. 19.5 metres; each of the 3 no. ICT buildings will accommodate ICT equipment rooms, mechanical equipment rooms, staff welfare facilities, ancillary office space, security rooms, storage, and loading bays; a customer compound, a power trunk building, a transformer compound and a water tank compound area are provided to the north of the ICT facility buildings;
Planning Reference	22433	the installation of underground electrical infrastructure between the existing Arklow Gas-insulated Switchgear (GIS) 220kV Substation and the permitted Pollahoney GIS Substation. This will include the installation of approximately two underground electricity cable circuits, each at 3.12km in length and associated underground ducting, horizontal directional drilling, joint bays, communication cabling infrastructure between the existing Arklow GIS 220kV Substation and the permitted Pollahoney GIS substation, (WCC reg ref 20/1285).
Status	Granted	
Location	Townlands of Killiniskyduff, Tiknock, Kilbride, and Shelton Abbey	

Table 9.9: Proposed or permitted developments in the Area

It is considered that there will be the potential for a short term slight negative cumulative impact associated with the construction/demolition phase of the subject development on ambient air quality and climate primarily as a result of the use of diesel to fuel construction plant and equipment. However, through the implementation of the mitigation measures and the integration into the design of the operational development of sustainable aspects and energy reduction features will ensure the receiving environment including off site residential receptors and existing habitats will not be adversely impacted.

In terms of dust, no significant impacts are predicted which good construction practice and proposed mitigation measures. Dust monitoring will also be employed at the Proposed Development site. Due to good construction practices at the site of the Proposed Development and offsite permitted developments, it is not anticipated that significant cumulative impacts will occur during the Construction phases.

Operational Stage

Assessment of operational stage impacts on air quality involved traffic data which is inclusive of traffic associated with other existing and permitted developments on the road networks surrounding the site both in current and future years. Therefore, cumulative impacts have been assessed in this regard and the impact on ambient air quality has been determined as insignificant.

9.7 Mitigation Measures

Construction Phase

The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the dust management plan. The key aspects of controlling dust are listed below. Full details of the dust minimisation plan can be found in Appendix 9.2.

- The specification and circulation of a dust management plan for the site and the identification of persons responsible for managing dust control and any potential issues.
- The development of a documented system for managing site practices with regard to dust control
- The development of a means by which the performance of the dust management plan can be monitored and assessed.
- The specification of effective measures to deal with any complaints received.

At all times, the procedures within the plan will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations. The procedures to rectify the problems are set out in Appendix 9.2 (Dust Management Plan).

Dust nuisance is defined when air quality standards relating to dust deposition and PM10 are exceeded. Where levels exceed specified air quality limit values, dust generating activities shall immediately cease and alternative working methods shall be implemented.

In order to minimise dust emissions during construction, a series of mitigation measures have been prepared in the form of a Dust Management Plan (see appendix 9.2). Provided the dust management measures outlined in the plan (see Appendix 9.2) are adhered to, the air quality impacts during the construction phase will not be significant. Regard has also been taken for the import of infill materials from off-site locations and potential dust impacts as a result of this will also be mitigated. With the implementation of all mitigation measures they will be no impact on the Avoca River.

Construction traffic and embodied energy of construction materials are expected to be the dominant source of greenhouse gas emissions as a result of the construction/demolition phase of the development. Construction vehicles, generators etc., may give rise to some CO2 and N2O emissions. However, due to short-term and temporary nature of these works, the impact on climate will not be significant.

Nevertheless, some site-specific mitigation measures can be implemented during the construction/demolition phase of the proposed development to ensure emissions are reduced further. In particular the prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.

- Use of rubble chutes and receptor skips during construction activities.
- During dry periods, dust emissions from heavily trafficked locations (on and off site) will be controlled by spraying surfaces with water and wetting agents.
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un- surfaced roads will be restricted to essential site traffic only.
- Re-suspension in the air of spillages material from trucks entering or leaving the site will be prevented by limiting the speed of vehicles within the site to 10kmh and by use of a

mechanical road sweeper.

- The overloading of tipper trucks exiting the site will not be permitted. Aggregates will be transported to and from the site in covered trucks.
- Where the likelihood of windblown fugitive dust emissions is high and during dry weather conditions, dusty site surfaces will be sprayed by a mobile tanker bowser.
- Wetting agents shall be utilised to provide a more effective surface wetting procedure.
- Exhaust emissions from vehicles operating within the construction site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the contractor by ensuring that emissions from vehicles are minimised by routine servicing of vehicles and plant, rather than just following breakdowns; the positioning of exhausts at a height to ensure adequate local dispersal of emissions, the avoidance of engines running unnecessarily and the use of low emission fuels.
- All plant not in operation shall be turned off and idling engines shall not be permitted for excessive periods. Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- Material stockpiles containing fine or dusty elements including soils shall be covered with tarpaulins. Where drilling or pavement cutting, grinding or similar types of stone finishing operations are taking place, measures to control dust emissions will be used to prevent unnecessary dust emissions by the erection of wind breaks or barriers. All concrete cutting equipment shall be fitted with a water dampening system.
- A programme of air quality monitoring shall be implemented at the site boundaries for the duration of construction/demolition phase activities to ensure that the air quality standards relating to dust deposition and PM_{10} are not exceeded. Where levels exceed specified air quality limit values, dust generating activities shall immediately cease and alternative working methods shall be implemented.
- A complaints log shall be maintained by the construction site manager and in the event of a complaint relating to dust nuisance, an investigation shall be initiated.
- Dust netting and site hoarding shall be installed along the south, east, and west site boundaries to minimise the propagation of fugitive windblown dust emissions falling on third party lands and existing residential areas.

Table 9.10 presents a summary of dust control techniques which will be implemented at the site during demolition activities.

Summary of Dust Control Techniques	
Sources of Particular Matter	**Control Technique**
Loading and unloading processes	**Containment / Suppression**
	Reducing drop heights
	Use of variable height conveyors
	Use of chutes
Double handling transfers points	**Site and process design**
	Reduction of vehicle movements
Aggregate stockpiles	**Appropriate siting**
	Away from closest receptors/site boundaries
	Use of enclosures and bunding
	Reduced drop heights
	Water suppression
	Sprays

	Bowsers
	Covering
	Covered stock bins
	Dust covers
Mobile Crushing of site generated C&D Waste (if applicable)	**Appropriate siting**
	Away from closest receptors/site boundaries
	Use of enclosures and bunding
	Reduced drop heights
	Water suppression
	Sprays
	Bowsers
Conveyors / transfer points	**Containment**
	Wind boards
	Housings
	Suppression
	Water sprays
	Housekeeping
	Clean up of spilled materials
	Appropriate siting
	Away from closest receptors/site boundaries
Concrete Cutting Plant	**Suppression**
	Water sprays fitted to equipment/plant
Roadways including site yard area.	**Suppression**
	Water sprays and bowsers
	Wheel wash at site compounds
Vehicles	**Washing / Covering**
	Wheel wash to be installed at site exit
	Vehicles exiting the site with C&D loads shall be covered with tarpaulin

Table 9.10: Summary of Dust Control Techniques

Operational Phase

No additional mitigation measures are required as the operational phase of the proposed development as it is predicted to have an imperceptible impact on ambient air quality and climate.

The operational phase mitigation by design measures to minimise the impact of the development on air quality and climate are as follows:

Mitigation Measures (Operational)

- Thermally efficient glazing systems on all units
- Mechanical Ventilation and Heat Recovery (MVHR) systems or equivalent installed in all residential developments
- Thermal insulation of walls and roof voids of all units
- Natural Gas heating in all units
- Inclusion of electric car charging points to encourage electric vehicle ownership

9.8 Predicted Impacts

Construction Phase

Air Quality

When the dust minimisation measures detailed in Appendix 9.2 are implemented, fugitive emissions of dust from the site will be short-term, negative, localised and imperceptible at nearby receptors.

Climate

According to the IAQM guidance (2014) site traffic, plant and machinery are unlikely to have a significant impact on climate. Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health.

Therefore, the impact of construction of the proposed development is likely to be negative, short-term and imperceptible with respect to human health.

Human Health

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development is likely to be negative, short-term and imperceptible with respect to human health.

Operational Phase

It is predicted that the operational phase with the implementation of mitigation measures will likely to be negative, long-term and imperceptible impact on air quality and climate.

9.9 'Do Nothing' Scenario

Should the project not proceed the site's baseline climate and air quality including odour will remain the same.

9.10 Worst Case Scenario

The main potential for adverse impact on local air quality will occur during the construction phase. The worst-case scenario therefore corresponds to the situation where the mitigation measures for construction activities fail or are not implemented. Should dust mitigation measures not be implemented during the construction phase, significant dust nuisance is likely in areas close to the construction site. Given the distance to sensitive receptors dust nuisance is not considered to be a significant issue providing mitigation measures are carried out.

9.11 Monitoring & Reinstatement

Monitoring of construction and demolition dust deposition at nearby sensitive receptors (residential dwellings) during the construction/demolition phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff

method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/(m2*day) during the monitoring period between 28 – 32 days. There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.

9.12 Difficulties in Compiling Information

There were no difficulties encountered in compiling this section of the EIAR.

9.13 References

- European Union (Planning & Development) (Environmental Impact Assessment) Regulations 2018 (SI No. 296 of 2018).
- Environmental Impact Assessment of Projects – Guidance on the preparation of the EIAR, European Commission, 2017.
- German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft
- Framework Convention on Climate Change (1997) Kyoto Protocol to The United Nations Framework Convention on Climate Change
- Framework Convention on Climate Change (1999) Ireland - Report on the in-depth review of the second national communication of Ireland
- Environmental Resources Management (1998) Limitation and Reduction of CO2 and Other Greenhouse Gas Emissions in Ireland
- EU (2014) EU 2030 Climate and Energy Framework
- Department of the Environment, Heritage and Local Government (DEHLG) (2003) Strategy to Reduce Emissions of Trans-boundary Pollution by 2010 to Comply with National Emission Ceilings - Discussion Document
- DEHLG (2004) National Programme for Ireland under Article 6 of Directive 2001/81/EC for the Progressive Reduction of National Emissions of Transboundary Pollutants by 2010
- DEHLG (2007a) Update and Revision of the National Programme for Ireland under Article 6 of Directive 2001/81/EC for the Progressive Reduction of National Emissions of Transboundary Pollutants by 2010
- Environmental Protection Agency (EPA) (2002) Guidelines on Information To Be Contained in Environmental Impact Statements
- EPA (2016) Air Quality Monitoring Report 2015 (& previous annual reports 1997-2014)
- EPA (2017) EPA Website: http://www.epa.ie/whatwedo/monitoring/air/
- UK DEFRA (2016) NOx to NO2 Conversion Spreadsheet (Version 5.1)
- Transport Infrastructure Ireland (2011) Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes
- Transport Infrastructure Ireland (2009) Guidelines for Assessment of Ecological Impacts of National Roads Schemes (Rev. 2, Transport Infrastructure Ireland, 2009)
- Department of the Environment, Heritage and Local Government (2010) Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities
- World Health Organisation (2006) Air Quality Guidelines - Global Update 2005 (and previous Air Quality Guideline Reports 1999 & 2000)
- Highways England (2013) Interim Advice Note 170/12 v3 Updated air quality advice on the assessment of future NOx and NO2 projections for users of DMRB Volume 11, Section 3, Part 1 'Air Quality

- EU (2017) Ireland's Final Greenhouse Gas Emissions in 2015
- Wicklow County Council Climate Action Plan 2024 - 2029

10. Landscape and Visual

10.1 Introduction

The report identifies and discusses the landscape and visual effects in relation to the proposed Large-scale Residential Development (LRD) of the site at Kilbride, Arklow, County Wicklow which includes the building of residential units, a local centre and creche along with all associated public realm works on the site. Further details of the proposed development are listed under 10.4 Characteristics of the Proposed Development.

The Landscape and Visual Impact Assessment (LVIA) was informed by both a desktop study and on-site surveys. The assessment follows the methodology outlined in the Guidelines for Landscape and Visual Impact Assessment, 3rd edition (2013), published by the UK Landscape Institute and the Institute for Environmental Management and Assessment. This chapter evaluates the potential impacts of the Proposed Development on the landscape and visual amenity of the area.

The likely nature and probability of effects on the landscape and visual resource associated with the overall project have been assessed. The assessment includes:

- A review of the existing receiving environment
- Prediction and characterisation of potential impacts
- Evaluation of the significance of those effects
- Consideration of mitigation measures, where appropriate

This chapter has been prepared by Trevor Sadler, Managing Director of McGill Planning Limited, who has worked for over 20 years as a Town Planner in Ireland. Trevor has a Masters in Regional and Urban Planning from University College Dublin. McGill Planning Limited, has carried out numerous EIAR and EIA Screenings. They have also been involved multiple Strategic Housing Developments, Large-scale Residential Development and regular planning applications in recent years.

10.2 Methodology

Landscape and Visual Impact Assessment (LVIA) is a key tool used to identify and evaluate the significance of changes brought about by development, both in terms of the landscape as an environmental resource and the effects on people's views and visual amenity. The methodology applied in this LVIA follows the approach set out in the Guidelines for Landscape and Visual Impact Assessment (3rd Edition, 2013), published by the Landscape Institute and the Institute of Environmental Management and Assessment, hereafter referred to as the GLVIA.

It is important to recognise that the definition of landscape adopted in the GLVIA encompasses not only rural, marine, and coastal landscapes (seascapes), but also the landscapes of villages, towns, and cities (Section 2.5, LI & IEMA, 2013).

Ireland is a signatory to the European Landscape Convention (ELC), which defines landscape as "an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors." This definition is significant as it broadens the understanding of landscape beyond aesthetics and visual amenity, positioning it as a shared resource that delivers a wide range of cultural, environmental, and economic benefits to individuals and society as a whole.

Guidance

The Guidelines for Landscape and Visual Impact Assessment highlight that, as a cultural resource, landscape serves as the backdrop to everyday life, offering opportunities for recreation, aesthetic enjoyment, and inspiration. It enhances the sense of place experienced by individuals and communities and acts as a record of historic socio-economic and environmental conditions, providing a tangible link to the past.

As an environmental resource, the landscape supports habitats for flora and fauna, plays a role in the water cycle by receiving, storing, conveying, and purifying water, and contributes to climate regulation through vegetation that stores carbon and produces oxygen.

Economically, the landscape underpins the provision of raw materials and space for activities such as food production, extraction of materials (e.g., timber, aggregates), energy generation (e.g., fossil fuels, wind, water, geothermal, solar), habitation, and recreational and tourism-related uses.

The concept of reversibility of change is also a key consideration. Where change is necessary to meet present needs, the potential to return the landscape (in this case, the suburban fringe) to its prior condition—thereby allowing for future development or management—should be considered. The proposed development may be regarded as reversible, as the removal of residential buildings and associated structures would allow the principal landscape and visual impacts to be undone.

Key Guidance Documents

Landscape and Visual Impact Assessment (LVIA) is a structured approach used to evaluate how proposed developments may alter the character of the landscape and affect visual experiences. It considers both the landscape as a valuable environmental asset and the impact on people's views and visual amenity.

The methodology for assessing landscape and visual effects draws upon established best practice and key guidance documents, including:

- *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition (2013), published by the Landscape Institute and the Institute of Environmental Management and Assessment (IEMA)
- *Guidelines on the Information to be Contained in Environmental Impact Statements*, Environmental Protection Agency (EPA), 2022

The GLVIA, developed jointly by the Landscape Institute (UK) and IEMA, reflects professional consensus across a broad network of practitioners in Ireland, the UK, and internationally. Originally prepared in line with relevant EU directives, the guidance is periodically supplemented through updates issued by the Landscape Institute, including Technical Guidance Note 06/19 on the visual representation of development proposals. GLVIA has become widely adopted and is recognised as the standard reference for LVIA in Ireland.

The 2022 EPA guidelines also encourage the use of specialist topic-specific guidance and directly cite the GLVIA as a key reference for applying professional judgement in visual and landscape assessments. According to paragraph 3.72 of the GLVIA:

"Some uncertainty is unavoidable in EIA, especially about matters that involve an element of judgement, such as assigning a level of significance to an effect. Such judgements should be explicit and substantiated rather than presented as objective fact. This is best done using agreed referable approaches, e.g. the Guidelines on Landscape and Visual Impacts Assessment provide guidance on what constitutes a severe visual effect".

Policy Documents

This assessment also references the Landscape and Landscape Assessment – Consultation Draft of Guidelines for Planning Authorities, published in 2000 by the Department of the Environment, Heritage and Local Government.

Concepts such as sensitivity, magnitude of change, and the nature and duration of effects are informed by the Guidelines for Landscape and Visual Impact Assessment (GLVIA). While GLVIA does not provide rigid definitions for these terms, it presents well-established principles and illustrative case studies intended to guide professional judgement and methodological approach. These descriptions are designed to supplement and enhance the EPA's guidance, particularly in the context of topic-specific assessments.

Landscape and Visual Assessment Process

The GLVIA sets out a structured process for assessment, which involves evaluating both the sensitivity of the landscape or visual receptor and the magnitude of change brought about by the proposed development. These two factors are then considered together to determine the overall significance of the resulting effects.

A key aspect of the GLVIA approach is its clear distinction between landscape effects and visual effects.

Landscape is shaped by the interaction of physical, natural, and cultural elements in the environment. The unique combination and spatial arrangement of these components give rise to the specific character of a place. To assess this, LVIA applies landscape character assessment—a process used to describe and analyse the landscape as a resource. This includes not only its physical features, but also its aesthetic, perceptual, and experiential qualities, all of which contribute to the distinct identity of a location.

Views and visual amenity, on the other hand, focus on how people perceive and interact with the landscape. In accordance with the GLVIA, visual effects are assessed separately from landscape effects, despite the close relationship between the two. Visual assessment involves analysing changes in the composition of views, how people are likely to respond to these changes, and the overall impact on visual amenity in the area.

The assessment of landscape and visual effects, therefore, considers how the proposed development influences the landscape's structure, character, and value as a resource, as well as how it alters views experienced by various groups of people. This evaluation is informed by a review of the development proposals, desktop analysis, and multiple site visits to the site and its broader context.

This dual-focus approach ensures that landscape and visual effects—while interconnected—are considered as distinct elements within the methodology, which is outlined below:

Methodology for Landscape Assessment

In Sections 10.5 Potential Impacts and 10.6 Potential Cumulative Impacts of this report, the landscape effects of the proposed development are assessed. The nature and scale of changes to the landscape elements and characteristics are identified, and the consequential effects on landscape character are discussed. Trends of change in the landscape are taken into account. The assessment of the significance of effects takes account of the sensitivity of the landscape resource and the magnitude of change to the landscape, which will result from the proposed development.

Definitions and descriptions of sensitivity, magnitude of change, quality and longevity of effects are derived from the GLVIA. The GLVIA does not set out specific definitions of descriptions used, but contains key widely used principles and case studies / examples that are intended to inform a professional's methodology, supported by their experience and judgements in relation to landscape and landscape change. These descriptions expand and complement the EPA guidelines as intended, in relation to topic- specific guidance.

Sensitivity of the Landscape Resource

Sensitivity is a combination of Landscape Value and Landscape Susceptibility.

Landscape values can be identified by the presence of landscape designations or policies, which indicate particular values, either on a national or local level. In addition, a number of criteria are used to assess the value of a landscape. These are described further below, in Table 10.1.

Landscape susceptibility is defined in the GLVIA as, *"The ability of the landscape receptor to accommodate the proposed development without undue consequences for the maintenance of the baseline scenario and/or the achievement of landscape planning policies and strategies."* Susceptibility also relates to the type of development – a landscape may be highly susceptible to certain types of development but have a low susceptibility to other types of development.

Landscape susceptibility (in terms of its ability to accommodate the proposed development) in relation to residential developments can include consideration of:

- Topography and skyline – uplands can easier absorb residential development depending on siting and design
- Landscape pattern and landcover – a simple landscape pattern can be less susceptible than a complex pattern, including varying types of landcover
- Settlement pattern – this can influence susceptibility

It includes consideration of landscape values as well as the susceptibility of the landscape to change. Landscape sensitivity is a function of its land use, landscape patterns and scale, visual enclosure and distribution of visual receptors, scope for mitigation, and the value placed on the landscape. It also relates to the nature and scale of development proposed.

Landscape Sensitivity ranges from *Very High* to *Negligible* as outlined in Table 10.1 below.

Sensitivity	Description
Very High	Areas where the landscape exhibits a very strong, positive character with valued elements, features and characteristics that combine to give an experience of unity, richness and harmony. The character of the landscape is such that its capacity for accommodating change in the form of development is very low. These attributes are recognised in landscape policy or designations as being of national or international value and the principal management objective for the area is protection of the existing character from change.
High	Areas where the landscape exhibits strong, positive character with valued elements, features and characteristics. The character of the landscape is such that it has limited/low capacity for accommodating change in the form of development. These attributes are recognised in landscape policy or designations as being of national, regional or county value and the principal management objective for the area is conservation of the existing character.
Medium	Areas where the landscape has certain valued elements, features or characteristics but where the character is mixed or not particularly strong. The character of the landscape is such that there is some capacity for change in the

	form of development. These areas may be recognised in landscape policy at local or county level and the principal management objective may be to consolidate landscape character or facilitate appropriate, necessary change.
Low	Areas where the landscape has few valued elements, features or characteristics and the character is weak. The character of the landscape is such that it has capacity for change; where development would make no significant change or would make a positive change. Such landscapes are generally unrecognised in policy and where the principal management objective is to facilitate change through development, repair, restoration or enhancement.
Negligible	Areas where the landscape exhibits negative character, with no valued elements, features or characteristics. The character of the landscape is such that its capacity for accommodating change is high; where development would make no significant change or would make a positive change. Such landscapes include derelict industrial lands or extraction sites, as well as sites or areas that are designated for a particular type of development. The principal management objective for the area is to facilitate change in the landscape through development, repair or restoration.

Table 10.1: Categories of Landscape Sensitivity

Magnitude of Landscape Change

The magnitude of change is a factor of the scale, extent and degree of change imposed on the landscape with reference to its key elements, features, and characteristics (also known as 'landscape receptors'). Five categories are used to classify Magnitude of Landscape Change.

For the purpose of assessment, five categories are used to classify the Magnitude of Landscape Change on the receiving environment, from *Very High* to *Negligible*. These categories are defined in Table 10.2 below.

Magnitude of Landscape Change	Description
Very High	Change that is large in extent, resulting in the loss of, or major alteration to key elements, features or characteristics of the landscape and/or introduction of large elements considered totally uncharacteristic in the context. Such development results in fundamental change in the character of the landscape.
High	Change that is moderate to large in extent, resulting in alteration or compromise to key elements, features or characteristics, and/or introduction of large elements considered uncharacteristic in the context. Such development results in a moderate to large change to the character of the landscape.
Medium	Change that is moderate in extent, resulting in partial loss or alteration to key elements, features or characteristics of the landscape, and/or introduction of elements that may be prominent but not necessarily uncharacteristic in the context. Such development results in moderate change to the character of the landscape.
Low	Change that is moderate or limited in scale, resulting in minor alteration to key elements, features or characteristics of the landscape, and/or introduction of elements that are not uncharacteristic in the context. Such development results in minor change to the character of the landscape.
Negligible	Change that is very limited in extent, resulting in no alteration to key elements, features, or characteristics of the landscape, and/or introduction of elements that are characteristic in the context. Such development results in minimal change to the character of the landscape.

Table 10.2: Magnitude of Landscape Change

Methodology for Visual Assessment

In Sections 10.5 Potential Impacts and 10.6 Potential Cumulative Impacts, the visual effects of the proposed development are assessed. Visual assessment considers the sensitivity of the viewers, (i.e. groups of people) and the magnitude of the changes to the composition and character of views. The assessment is made for a number of viewpoints selected to represent the range of visual receptors in the receiving environment. The significance of the visual effects experienced at these locations is assessed by measuring the visual receptor sensitivity against the magnitude of change to the view resulting from the proposed development.

Sensitivity of the Visual Receptor

Visual receptor sensitivity is a function of the following two main considerations:

1. Susceptibility of the visual receptor to change. This depends on the occupation or activity of the people experiencing the view, and the extent to which their attention or interest is focussed on the views or visual amenity they experience at that location. Visual receptors most susceptible to change include residents at home, people engaged in outdoor recreation focused on the landscape (e.g. trail users), and visitors to heritage or other attractions and places of community congregation where the setting contributes to the experience.

Visual receptors less susceptible to change include travellers on road, rail and other transport routes (unless on recognised scenic routes which would be more susceptible), people engaged in outdoor recreation or sports where the surrounding landscape does not influence the experience, and people in their place of work or shopping where the setting does not influence their experience.

2. Value attached to the view. This depends to a large extent on the subjective opinion of the visual receptor but also on factors such as policy and designations (e.g. scenic routes, protected views), or the view or setting being associated with a heritage asset, visitor attraction or having some other cultural status (e.g. by appearing in arts).

3.

For the purpose of assessment, five categories are used to classify Sensitivity of Visual Receptor. These categories range from *Very High* to *Negligible* and are described in Table 10.3 below.

Sensitivity	Description
Very High	Viewers at iconic viewpoints - towards or from a landscape feature or area that are recognised in policy or otherwise designated as being of high value or national value. This may also include residential viewers who are focussed to a large extent on the view.
High	Viewers at viewpoints that are recognised in policy or otherwise designated as being of value, or viewpoints that are highly valued by people that experience them regularly (such as views from houses or outdoor recreation features) and views which are highly valued by the local community. This may also include tourist attractions, and heritage features of regional or county value, and viewers travelling on scenic routes.
Medium	Viewers considered of medium susceptibility, such as locations where viewers are travelling at slow or moderate speeds through or past the affected landscape in cars or on public transport, where they are partly but not entirely focused on the landscape, or where the landscape has some valued views. The views are generally not designated, but include panoramic views or views

	judged to be of some scenic quality, which demonstrate some sense of naturalness, tranquillity or some rare element in the view.
Low	Viewers at viewpoints reflecting people involved in activities not focused on the landscape e.g. people at their place of work or engaged in similar activities such as shopping, etc. The view may present an attractive backdrop to these activities but there is no evidence that the view is valued, and not regarded as an important element of these activities. Viewers travelling at high speeds (e.g. motorways) may also be generally considered of low susceptibility.
Negligible	Viewpoints reflecting people involved in activities not focused on the landscape e.g. people at their place of work or engaged in similar activities such as shopping where the view has no relevance or is of poor quality and not valued.

Table 10.3: Categories of Sensitivity of Visual Receptor

Magnitude of Change to the View

Classification of the magnitude of change takes into account the size or scale of the intrusion of the proposed development into the view, (relative to the other elements and features in the composition) i.e. its relative visual dominance), the degree to which it contrasts or integrates with the other elements and the general character of the view, and the way in which the change will be experienced (e.g. in full view, partial or peripheral, or glimpses). It also takes into account the geographical extent of the change, the duration and the reversibility of the visual effects. It should be noted that the proposed turbines are considered a *'reversible'* element, as on decommissioning they can be removed.

Five categories are used to classify **Magnitude of Change to a View**. These range from ***Very High*** to ***Negligible*** and are defined in Table 10.4 below.

Magnitude of Change to the view	Description
Very High	Full or extensive intrusion of the development in the view, or partial intrusion that obstructs highly valued features or characteristics, or the introduction of elements that are completely out of character in the context, to the extent that the development becomes dominant in the composition and defines the character of the view and the visual amenity.
High	Extensive intrusion of the development in the view, or partial intrusion that obstructs valued features, or introduction of elements that may be considered uncharacteristic in the context, to the extent that the development becomes co-dominant with other elements in the composition and affects the character of the view and the visual amenity.
Medium	Partial intrusion of the development in the view, or introduction of elements that may be prominent but not necessarily uncharacteristic in the context, resulting in change to the composition but not necessarily the character of the view or the visual amenity.
Low	Minor intrusion of the development into the view, or introduction of elements that are not uncharacteristic in the context, resulting in minor alteration to the composition and character of the view but no change to visual amenity.
Negligible	Barely discernible intrusion of the development into the view, or introduction of elements that are characteristic in the context, resulting in slight change to the composition of the view and no change in visual amenity.

Table 10.4: Magnitude of Change to a View

In this case, a number of tools are used to assist in the assessment of visual effects. These include Photomontages, which are produced from selected viewpoints. Initial viewpoints for photomontages

are selected during the desk study with the exact location confirmed in the field during the site visit. The completed photomontages are also used to assist in the assessment of visual effects.

Significance of Effect

In order to classify the significance of landscape and visual effects, the predicted magnitude of change is measured against the sensitivity of the landscape/viewpoint. The definitions used by the EPA (2022) provide a useful scale to describe the significance of the effects.

There are seven classifications of significance, namely: (1) imperceptible, (2) not significant, (3) slight, (4) moderate, (5) significant, (6) very significant, (7) profound. Please refer to Table 10.5, below.

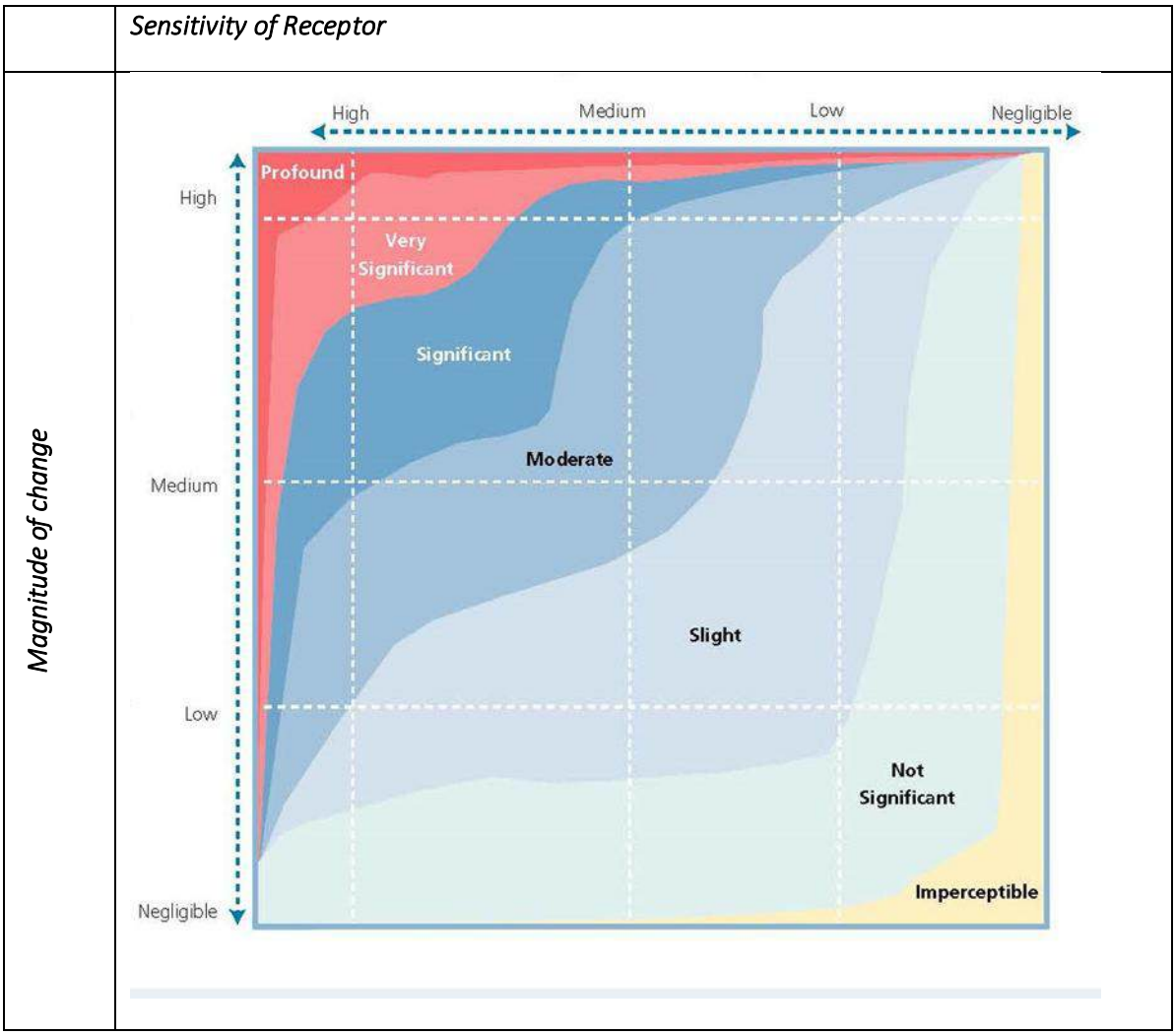


Table 10.5: Significance Matrix (based on EPA 2022 and GLVIA 2013)

Note: This table is a guideline only, but is useful in illustrating the way in which judgements are combined to arrive at a judgement regarding significance, while illustrating that an element of professional judgment is also applied. The assessor also uses professional judgement informed by their expertise, experience and common sense, to arrive at a classification of significance that is reasonable and justifiable. The GLVIA 3rd Edition recognises (at paragraph 2.23) that:

"Professional judgement is a very important part of LVIA. While there is scope for quantitative measurement of some relatively objective matters, much of the assessment must rely on qualitative judgements."

The predicted impacts are also classified as beneficial, neutral, or adverse. This is not an absolute exercise, in particular, visual receptors' attitudes to development, and thus their response to the impact of a proposed development, will vary. However, the methodology applied is designed to provide robust justification for the conclusions drawn. These qualitative definitions are included in Table 10.6 below.

Quality of Effect	Definition
Adverse	Scheme at variance with landform, scale, pattern. Would degrade, diminish or destroy the integrity of valued features, elements or their setting or cause the quality of the landscape(townscape)/view to be diminished.
Neutral	Scheme complements (or does not detract from) the scale, landform and pattern of the landscape(townscape)/view and maintains landscape quality.
Beneficial	Improves landscape(townscape)/view quality and character, fits with the scale, landform and pattern and enables the restoration of valued characteristic features or repairs / removes damage caused by existing land uses.

Table 10.6: Quality of Effect

Impacts / effects are also categorised according to their longevity or timescale as in Table 10.7 below.

Duration	Description
Temporary	Effects lasting one year or less
Short Term	Effects lasting one to seven years
Medium Term	Effects lasting seven to fifteen years
Long Term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years

Table 10.7: Duration of Effect

10.3 Receiving Environment

This section provides an overview of relevant landscape-related planning policy as set out in the National Planning Framework, the Regional Spatial and Economic Strategy, the Wicklow County Development Plan and the Arklow & Environs Local Area Plan.

The Development Plan identifies key objectives, sensitivities, and constraints that influence the potential for development within the county, particularly in relation to the protection of landscape character, scenic routes, views and prospects, and areas of high amenity or environmental sensitivity. These policies provide the framework within which the proposed development is assessed, helping to determine the appropriateness of development in this location.

The receiving environment is described in terms of its landscape character, physical attributes, and the various elements that shape the local setting—such as cultural heritage, recreation assets, settlement patterns, and amenity values. This analysis provides a baseline understanding of the landscape's existing qualities and informs an evaluation of its capacity to accommodate change.

In line with the principles of the Guidelines for Landscape and Visual Impact Assessment (GLVIA), the study considers the value of the landscape in terms of its potential for protection, conservation, enhancement, or change, as guided by the strategic objectives and detailed landscape policies of the Wicklow County Development Plan.

Planning Policy Context

National Planning Framework

In accordance with NPF National Policy Objectives 3b, 11, 33 and 35, the development supports compact growth, residential density, and efficient use of serviced land, while minimising impact on the surrounding rural landscape. The lands are zoned for residential development and have been specifically identified for such use within the Arklow and Environs Local Area Plan, aligning with the objectives of the NPF. The proposal is fully aligned with the NPF's strategic goals for sustainable settlement patterns:

National Policy Objective 3b

"Deliver at least 30% of all new homes that are targeted in settlements other than the five cities, within their existing built-up footprints."

National Policy Objective 11

"In meeting urban development requirements, there will be a presumption in favour of development that can encourage more people and generate more jobs and activity within existing cities, towns and villages..."

National Policy Objective 33

"Prioritise the provision of new homes at locations that can support sustainable development and at an appropriate scale of provision relative to location."

National Policy Objective 35

"Increase residential density in settlements, through a range of measures including reductions in vacancy, reuse of existing buildings, infill development schemes, area or site-based regeneration and increased building heights."

National Policy Objective 59

"Enhance the visibility and protection of our national heritage including…landscape."

Regional Spatial and Economic Strategy 2019-2031

Arklow is located within the Eastern and Midland Region as defined by the Regional Spatial and Economic Strategy (RSES) 2019–2031, which encompasses County Wicklow and is a key component of Ireland's spatial planning framework. Arklow is identified as a significant urban centre in the Bray to Arklow study area, which is recognized for its growth potential within the regional development plan. This area, served by key transport corridors such as the N11/M11 and the Dublin–Rosslare rail line, is expected to experience significant population and employment growth by 2040.

In alignment with National Policy Objective NPO 68, a notable increase in population is planned for Arklow, with the town designated as an area for growth and enhanced economic activity. Arklow's strategic position near Dublin, its connection to major national roads, and its proximity to key port facilities and rail networks underline its importance within the regional context. The town, with a population of over 14,000 in 2022, plays a vital role as a service and economic hub for the surrounding area.

Arklow's capacity for growth is highlighted by the RSES, which outlines potential increases in population and employment over both the short and long term. The strategic focus is on promoting compact growth, enhancing the town's public realm, and fostering the development of key sites in accordance with sustainable and balanced planning principles.

Arklow's key development objectives include regeneration, residential development, economic diversification, and the provision of enabling infrastructure. Relevant Regional Policy Objectives (RPOs) for the proposed development in Arklow include:

RPO 4.26: *"Core strategies in local authority development plans shall support objectives to achieve a minimum of 30% of housing in Key Towns by way of compact growth through the identification of key sites for regeneration."*

RPO 4.28: *"Support the continued development of Arklow as a vibrant town with a thriving economy; an integrated public transport network; an attractive built environment; and high-quality housing, employment opportunities, services, recreational amenities, and community facilities."*

RPO 4.32: *"Encourage the transition towards sustainable and low-carbon transport modes in Arklow through the provision of high-quality walking and cycling routes offering direct access to local destinations and public transport hubs."*

Strategic developments in the region also include the enhancement of transport connectivity, with the development of improved road and rail infrastructure to support long-term growth, including potential improvements to the N11/M11 corridors.

Arklow's green spaces, scenic assets, and recreational areas are also highlighted in the RSES as part of the region's green infrastructure network. Relevant Green Infrastructure Policy Objectives for the proposed development include:

RPO 5.7: *"Co-ordinate across local authority boundaries to identify, manage, develop, and protect regional Green Infrastructure, to enhance strategic connections and develop a Green Infrastructure policy in the Eastern and Midland Region."*

RPO 5.8: *"Support the promotion and development of greenway infrastructure and facilities in the region and foster connections between key strategic cycle routes and greenways as outlined in the National Transport Authority's Greater Dublin Area Cycle Network Plan."*

Wicklow County Development Plan 2022-2028

A review of Map Nos 17.10B and 17.11, Schedule 17.11 Views of Special Amenity Value or Special Interest and Schedule 17.12 Prospects of Special Amenity Value or Special Interest of the Wicklow County Development Plan 2022-2028 did not identify any listed views and prospects in proximity to the application site.

CPO 11.43 of the Development Plan states that it is the policy of Wicklow County Council: *"To promote and encourage the recreational use of coastline, rivers and lakes and the development of 'blueways' in the County subject to normal environmental protection and management criteria. Where such recreational uses involve the development of structures or facilities, the Planning Authority will ensure that the proposals will respect the natural amenity and character of the area, listed views and prospects onto and from the area in question. Where possible, such structures should be set back an appropriate distance from the actual amenity itself and should not adversely affect the unique*

sustainable quality of these resources."

Arklow and Environs Local Area Plan 2018-2024

Chapter 10 of the Arklow and Environs Local Area Plan 2018-2024 contains Heritage Policy HT3 which aims to: *Protect and enhance the character, setting and environmental quality of natural, architectural and archaeological heritage, and in particular those features of the natural landscape and built structures that contribute to its special interest. The natural, architectural and archaeological heritage of the area shall be protected in accordance with the objectives set out in the Wicklow County Development Plan"*

Site Location and Immediate Context – Site Character

Figure 10:1 Site Location and Surrounding Environment

The site as a whole is currently in agricultural use and slopes in a broadly north / south direction to the town marsh and Avoca River.

The Pyramid of Arklow; national monument, and its associated graveyard are located to the north of the ownership area but at a significant distance outside of the application site and the proposed new

road. This pyramid has been well maintained over the years. There is also a surrounding external wall around the graveyard which is in varying condition.

There are hedgerows and trees on the site but there are no category A trees within the site. To the south of the site, there is an area within the Arklow Town Marsh pNHA (proposed Natural Heritage Area). This pNHA is a non-statutory designation. There is also a small drainage ditch to the east of the subject site. The site is not located within a Conservation Area or an Architectural Conservation Area.

To the north of the subject site are agricultural fields and an industrial estate. The industrial estate is largely screened by existing vegetation. To the east of the site is a large residential area made up of established housing estates. To the south of the site is the Arklow Marsh, a low-lying area of wetland and dense vegetation. To the west of the site are further agricultural lands and the M11 motorway.

10.4 Characteristics of the Proposed Development

The proposed development is for the construction of a residential scheme with all associated infrastructure and amenities, in the form of Large-Scale Residential Development LRD, in full compliance with planning guidance applying to LRD schemes.

The proposed mixed use Large scale Residential Development will result in the demolition of an existing dwelling and 2 no. sheds/outbuildings and the construction of 666 no. residential units with a mix of semidetached and terraced houses along with duplex apartments and apartments. These will comprise 1, 2, 3 and 4 bed units. All residential units will have associated private open space facing north/ south/ east/ west. The proposal will also deliver a local centre containing 3 no. retail units, 3 no. community/ medical units and 1 no. creche unit. A new pedestrian/ cyclist link is provided via a new boardwalk and bridge across the marsh and over the Avoca River adjoining the existing greenway and the Main Street. A new road providing vehicular access is also proposed connecting to the north to Kilbride Road along with road improvements in the surrounding area. The development will also provide for landscaping, public open spaces and all associated site development works to enable the development including boundary treatments, attenuation storage area and other service provision including ESB works.

10.5 Potential Impacts

Construction Phase

Construction Phase visual effects will involve the movement of machinery to and from the site and the carrying out of earthworks on the site, vegetation removal and the construction of temporary structures and facilities. This is temporary in duration to be carried out on a phased basis.

The visual effects during the construction phase are considered to impart a High magnitude of change on the site and immediate vicinity, but not to the wider area. This will result in a Temporary, Moderate, to Significant adverse visual effect on the more sensitive viewers (residents to the north and east) Visual effects during construction will not result in pronounced visual effects to the north or east of the site.

Operational Phase

Based on the desk study, review of the proposed development, site characteristics and sensitivity, as well as the visibility of the site, nineteen representative viewpoints (listed in Table 10.9) were selected to assess visual effects. These are included and described below, and existing photographs and proposed photomontages are provided in a separate booklet, please refer to Appendix 10.1.

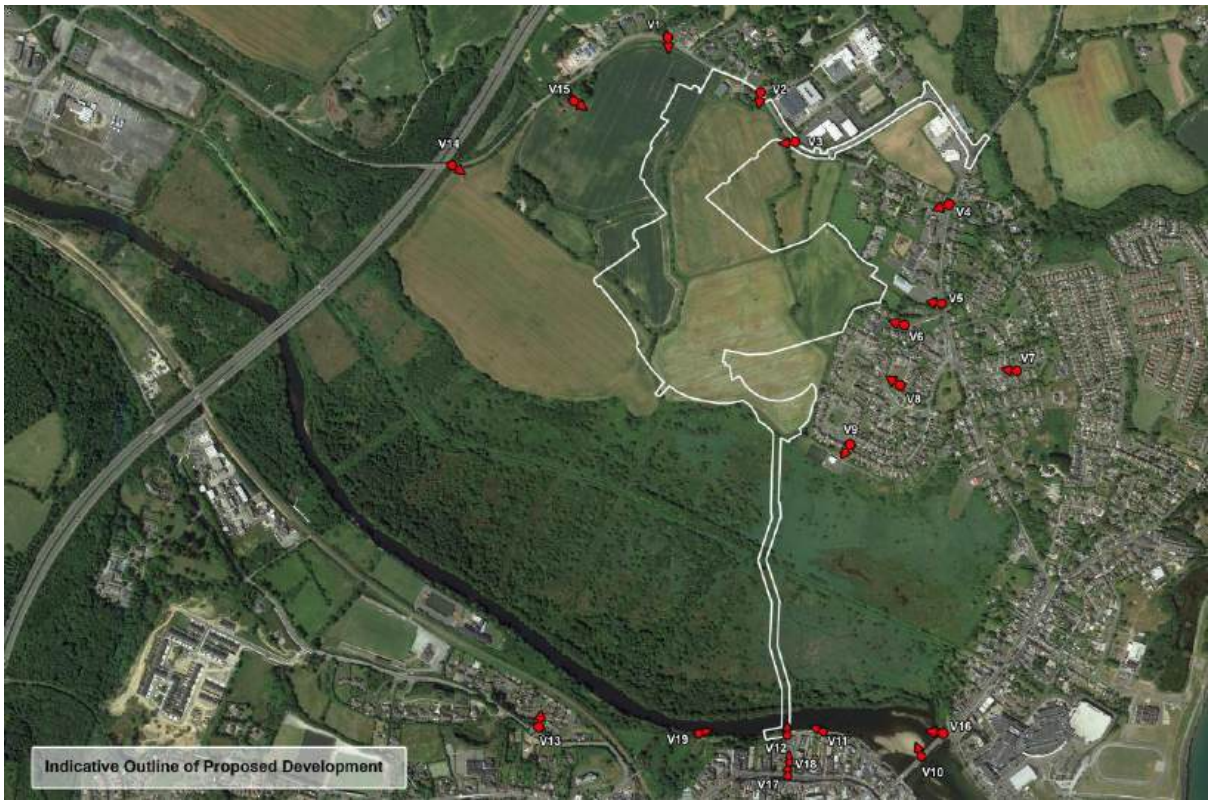


Figure 10:2 Viewpoints Location Map

Viewpoint	Description
1	View from Kilbride Road looking south east
2	View from Kilbride Road looking south
3	View from Kilbride Road looking south west
4	View from Dublin Road / Monument Lane looking south west
5	View from Dublin Road looking west
6	View from Carrigmor looking west
7	View from Templerainey Heights looking west
8	View from Tyronell Close/Windmere Avenue looking west
9	View from Avondale Crescent / Willow Grove looking south
10	View from the Nineteen Arches Bridge looking north west
11	View from the Riverwalk (south of the Avoca River) looking west
12	View from the Riverwalk (south of the Avoca River) looking north
13	View from Vale Road looking north
14	View from the Kilbride Road Bridge over the M11 looking east
15	View from the Old Kilbride Cemetery looking east
16	View from the Nineteen Arches Bridge looking west
17	View from St. Mary's Park, Main Street looking north
18	View from Main Street Car Park looking north
19	View from the RiverWalk looking east

View No. 1 from Kilbride Road looking south-east

Figure 10:3 Baseline and Proposed View from Kilbride Road looking south east

Existing View	View 1 looks south/south-east towards the site from the Kilbride Road (L-6179). The Kilbride development lands are visible in the middle ground south of the road due to the low nature of the boundary planting along the road. Arklow town centre is discernible in the distance. To the left of picture one of the agricultural outbuildings on site (due for removal) is visible.
Sensitivity	Medium
Proposed View	The proposed view shows the north-western extent of the proposed residential development. The scale of the development will be modest and will not dominate views along the Kilbride Road at this point and which is aided by the provision of landscaping within the development. As part of the wider built environment, it will integrate with the views of the rest of the town in the background.
Magnitude of Change	Medium
Significance of Effects	Beneficial

View no 2. from Kilbride Road looking south

Figure 10:4 Baseline and Proposed View from Kilbride Road looking south

Existing View	View 2 looks south towards the site from the Kilbride Road (L-6179). The view shows the entrance to the existing dwelling which itself is not visible from the road at this location. The boundary of the property onto the public road comprises hedgerow and planting in an unkempt state.
Sensitivity	Medium
Proposed View	The proposed view shows the northern extent of the residential development along the Kilbride Road alongside the permitted school campus in the rear background. The layout, scale, set back and landscaping will ensure that the development does not dominate views along the road and will integrate with the adjoining developments.
Magnitude of Change	Medium
Significance of Effects	Beneficial

View no. 3 from Kilbride Road looking south west

Figure 10:5 Baseline and Proposed View from Kilbride Road looking south west

Existing View	View 3 looks south-west towards the site from the Kilbride Road (L-6179). The view shows thee mature hedgerow and trees along the roadside boundary with ESB lines crossing overhead.
Sensitivity	Medium
Proposed View	The proposed view shows the northern extent of the proposed residential development and associated works to the public road. The scale of the development will be modest, will not dominate views along the road and will integrate with the adjoining developments.
Magnitude of Change	Medium
Significance of Effects	Beneficial

View no. 4 from Dublin Road / Monument Lane looking south-west

Figure 10:6 Baseline and Proposed View from Dublin Road / Monument Lane looking south-west

Existing View	View 4 looks west/south-west towards the site from the Dublin Road (R772). In the middle ground is the junction with Monument Lane. Residential properties along the lane are screened with mature boundary planting. St. Joseph's RC Church and car park is visible in the middle ground.
Sensitivity	Medium
Proposed View	The development will not be visible from this view.
Magnitude of Change	Negligible
Significance of Effects	Neutral

View no. 5 from Dublin Road looking west

Figure 10:7 Baseline and Proposed View from Dublin Road looking west

Existing View	View 5 looks west towards the site from the Dublin Road (R772) near the junction with Carrigmor – a residential cul de sac that is partially screened by boundary hedging. To the right of the view is St Joseph's national school ground including car park.
Sensitivity	Low
Proposed View	The development will not be visible from this view.
Magnitude of Change	Negligible
Significance of Effects	Neutral

View no. 6 from Carrigmor looking west

Figure 10:8 Baseline and Proposed View from Dublin Road looking west

Existing View	View 6 looks west towards the site from the Carrigmor residential cul de sac, which comprises large two-storey dwellings with front driveways and across from a small, lawned open space with boundary trees.
Sensitivity	Low
Proposed View	The development will not be visible from this view.
Magnitude of Change	Negligible
Significance of Effects	Neutral

View no. 7 from Templerainey Heights looking west

Figure 10:9 from Templerainey Heights looking west

Existing View	View 7 looks west towards the site from Templerainey Park, a small residential estate of detached houses, east of the Dublin Road (R772). The residential street rises from the Dublin Road and provides long distance views towards Croghan Mountain and Raheenleagh Windfarm. The development site sits in the middle ground but is not clearly discernible behind existing houses and vegetation.
Sensitivity	Medium
Proposed View	The development will not be visible from this view.
Magnitude of Change	Negligible
Significance of Effects	Neutral

View no. 8 from Tyronell Close / Windemere Avenue looking west

Figure 10:10 Baseline and Proposed View from Tyronell Close / Windemere Avenue looking west

Existing View	View 8 looks west towards the site from an open space adjoining Windemere Avenue and Tyronell Close residential estates, which comprises semi-detached and terraced housing. The development site is visible in the middle ground with hills in the vicinity of Shelton Abbey, Woodenbridge and Avoca visible in the distance.
Sensitivity	Medium
Proposed View	The development will be partially visible in the middle background. The height of the local centre block will mark the heart of the new residential community, but the scale will not dominate the long-distance views of the uplands in the distance. There will be strong visual integration with the existing residential estates in the foreground and the development will appear as a natural extension of the built-up area of North Arklow as is designated in planning.
Magnitude of Change	Medium
Significance of Effects	Beneficial

View no. 9 from Avondale Crescent / Willow Crescent looking south

Figure 10:11 Baseline and Proposed View from Avondale Crescent / Willow Crescent looking south

Existing View	View 9 looks south from Avondale Crescent / Willow Grove residential estates located east of the development site. The view shows the gated entrance to the Marhslands Youth and Sports Centre. Arklow town centre is visible in the background.
Sensitivity	Medium
Proposed View	The proposed boardwalk will be visible through the Arklow Marsh providing a new sustainable transport link between the development, North Arklow and the town centre. Whilst visible, the boardwalk will not dominate the view towards the Town Centre. It's simple and elegant design will allow it to blend into the wider landscape.
Magnitude of Change	Medium
Significance of Effects	Beneficial

View no. 10 from the Nineteen Arches Bridge looking north-west

Figure 10:12 Baseline and Proposed View from the Nineteen Arches Bridge looking north-west

Existing View	View 10 is taken from the Nineteen Arches Bridge over the Avoca River looking north-west towards the development site. The Avoca River is in the foreground with the boundary to Arklow Marsh along the northern bank marked by dense, mature trees and planting. The marsh and development site are therefore not visible in the middle-ground. In the background Kilpatrick Hill/Ballymoyle Forest, and Ballinakill Hill is visible.
Sensitivity	High
Proposed View	The development will not be visible from this view.
Magnitude of Change	Negligible
Significance of Effects	Neutral

View no. 11 from the RiverWalk (south of the Avoca River) looking west

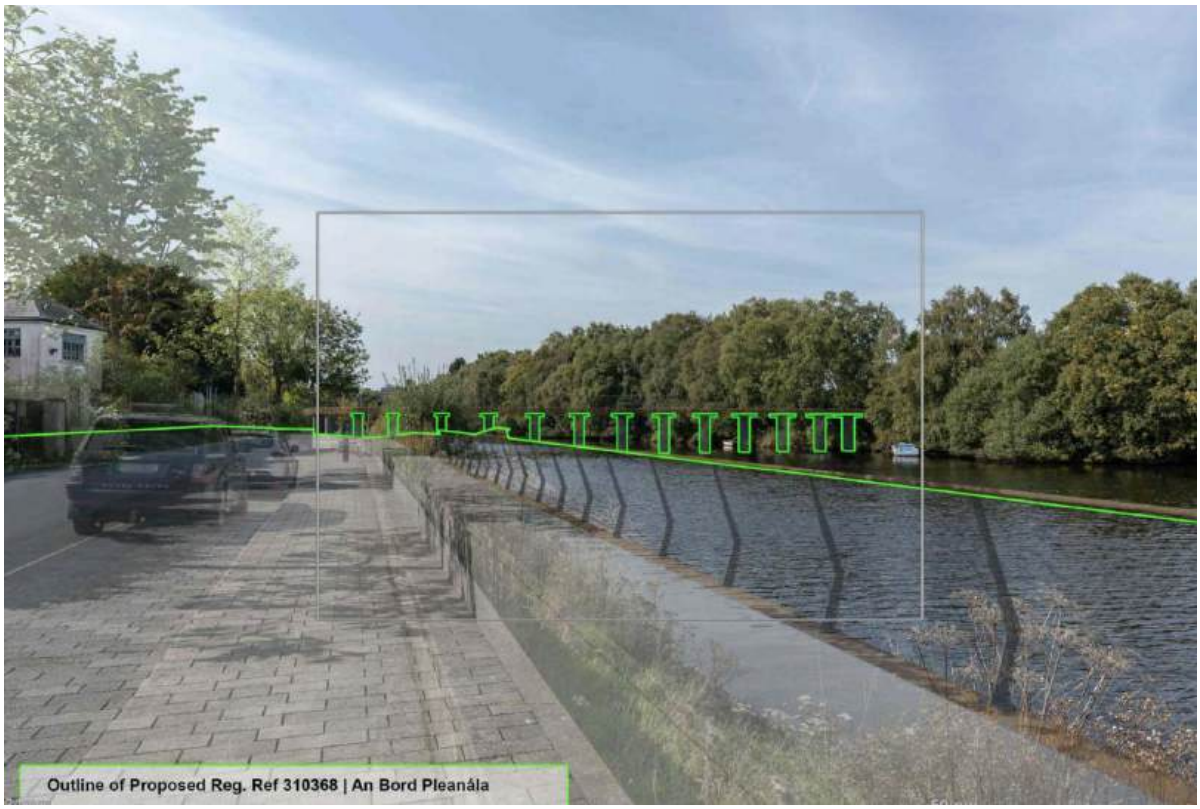


Figure 10:13 Baseline Proposed View, and Proposed View Containing ABP 310368 from the RiverWalk (south of the Avoca River) looking west

Existing View	View 11 is from RiverWalk near Arklow Town Centre looking west along the Avoca River towards where the planned pedestrian/cyclist bridge is planned. The northern river bank is marked by dense, mature trees, screening Arklow Marsh. Along RiverWalk is car parking, a footpath and commercial properties.
Sensitivity	Medium - High
Proposed View	The proposed view shows the pedestrian/cyclist bridge across the Avoca River sitting atop the debris trap columns which are already permitted under the Arklow Flood Relief Scheme (Planning Ref. ABP-310368-21). The permitted flood defence wall along the southern bank is also visible and the transformation of the vehicular carriageway along RiverWalk into an enhanced public realm for pedestrians and cyclists primarily.
Magnitude of Change	The magnitude of change as a result of the infrastructure permitted as part of the Arklow Flood Relief Scheme (the debris trap columns across the river and flood defence wall and associated works) will be High. With the addition of the bridge atop the columns the magnitude of change will remain High.
Significance of Effects	The effects of the permitted Arklow Flood Relief Scheme works of themselves are likely to be perceived as Adverse in the short term. This significance of impact would be sustained with the inclusion of the pedestrian/cyclist bridge. However the impact will reduce over time and the significance change to Beneficial as these infrastructural interventions compose into the urban context and provide significant amenity value and connectivity for the town.

View no. 12 from the RiverWalk (south of the Avoca River) looking north

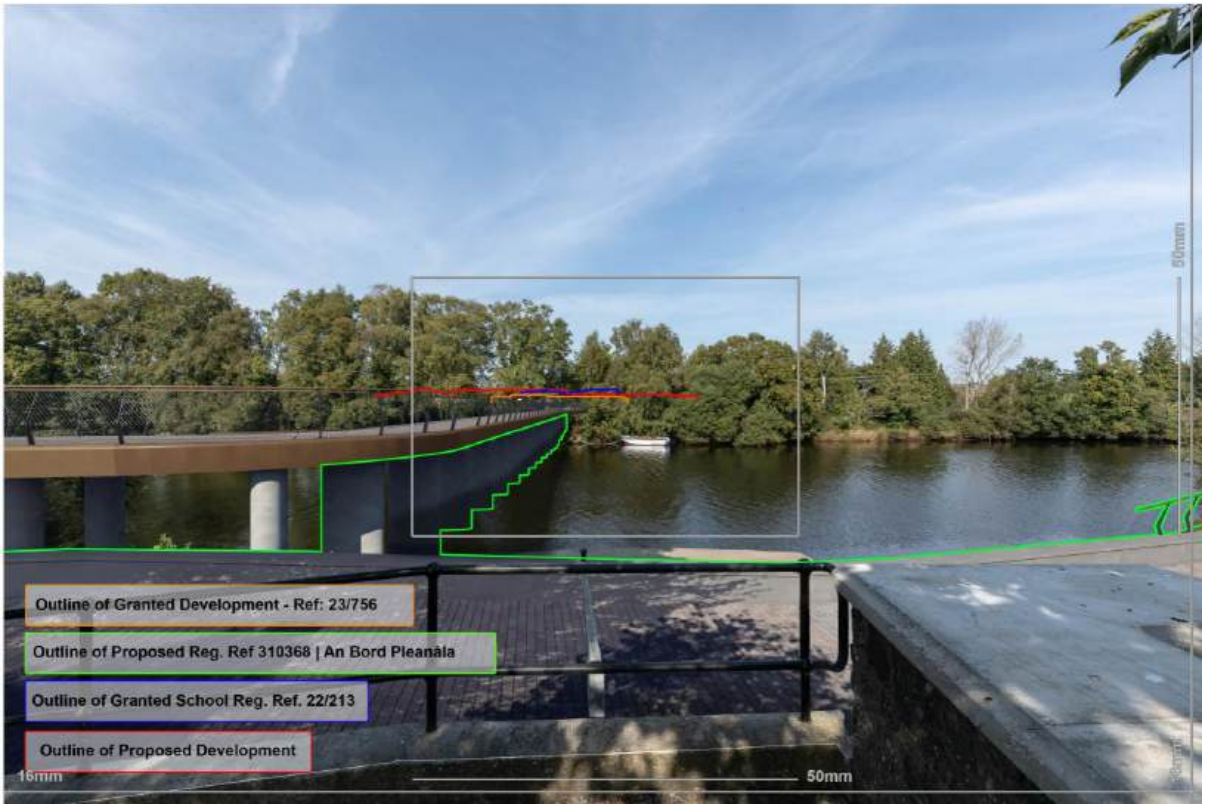


Figure 10:14 Baseline and Proposed View from the RiverWalk (south of the Avoca River) looking north

Existing View	View 12 is taken from RiverWalk looking north. The northern river bank is marked by dense, mature trees, screening Arklow Marsh and the development site. In the foreground is the pedestrian connection from Riverwalk to Arklow Town Car Park.
Sensitivity	Medium-High
Proposed View	The proposed view shows the pedestrian/cyclist bridge across the Avoca River sitting atop the debris trap columns and public realm improvements along RiverWalk which are already permitted under the Arklow Flood Relief Scheme (Planning Ref. ABP-310368-21).
Magnitude of Change	The magnitude of change as a result of the infrastructure permitted as part of the Arklow Flood Relief Scheme (the debris trap columns across the river in particular) will be High. With the addition of the bridge atop the columns the magnitude of change will remain High.
Significance of Effects	The effects of the permitted Arklow Flood Relief Scheme work of themselves are likely to be perceived as Adverse in the short term. This significance of impact would be sustained with the inclusion of the pedestrian/cyclist bridge. However, the impact will reduce over time and the significance change to Beneficial as these infrastructural interventions compose into the urban context and provide significant amenity value and connectivity for the town.

View no. 13 from Vale Road looking north

Figure 10:15 Baseline and Proposed View from Vale Road looking north

Existing View	View 13 is taken from Vale Road (R747) west of Arklow Town Centre. The view looks north towards Arklow Marsh and the development site. In the foreground is Glendale Estate comprising two-storey, semi-detached houses with a central green area. Behind the estate is the elevated Dublin-Rosslare Europort railway line. The development site can be seen in the middle ground, and partially Kilbride Industrial Estate. In the background Kilpatrick Hill/ Ballymoyle Forest, and Ballinakill Hill is visible.
Sensitivity	Medium
Proposed View	The roofs of houses in the western extent of the development will be visible in the middle ground but will not dominate the long-distance views of the uplands in the distance. The development will appear as a natural extension of the built-up area of North Arklow as is designated in planning.
Magnitude of Change	Medium
Significance of Effects	Beneficial

View no. 14 from the Kilbride Road Bridge over the M11 looking east

Figure 10:16 Baseline and Proposed View from the Kilbride Road Bridge over the M11 looking east

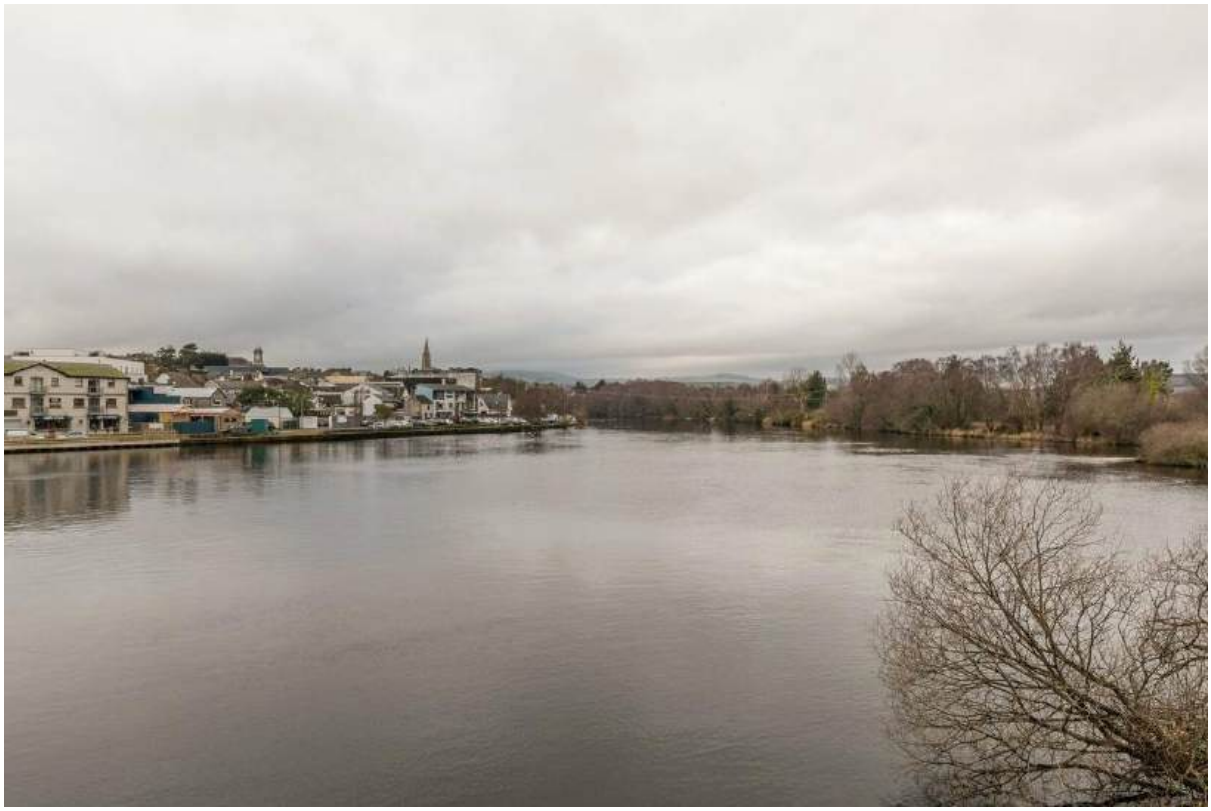
Existing View	View 14 is taken from the Kilbride Road (L-6179) bridge over the M11 looking east / south-east towards the development site. Overgrown vegetation along the road restricts views into the lands. However to the south there are partial views of Arklow Town Centre.
Sensitivity	Medium
Proposed View	The development will not be visible from this view.
Magnitude of Change	Negligible
Significance of Effects	Neutral

View no. 15 from the Old Kilbride Cemetery looking east

Figure 10:17 Baseline and Proposed View from the Old Kilbride Cemetery looking east

Existing View	View 15 is taken from the Old Kilbride Cemetery where the Howard Mausoleum Pyramid is located, off the Kilbride Road (L-6179). The view looks east over the development lands which are currently in agricultural use. The existing built-up area of North Arklow is visible as is Arklow Town Centre in the right background and Rock Big Quarry in the far distance.
Sensitivity	Medium
Proposed View	The development will be visible in the middle-ground but the scale will not dominate the long-distance views towards the Town Centre, the coast or Rock Big. The development will appear as a natural extension of the built-up area of North Arklow as is designated for in planning.
Magnitude of Change	Medium
Significance of Effects	Neutral

View no. 16 from the Nineteen Arches Bridge looking west



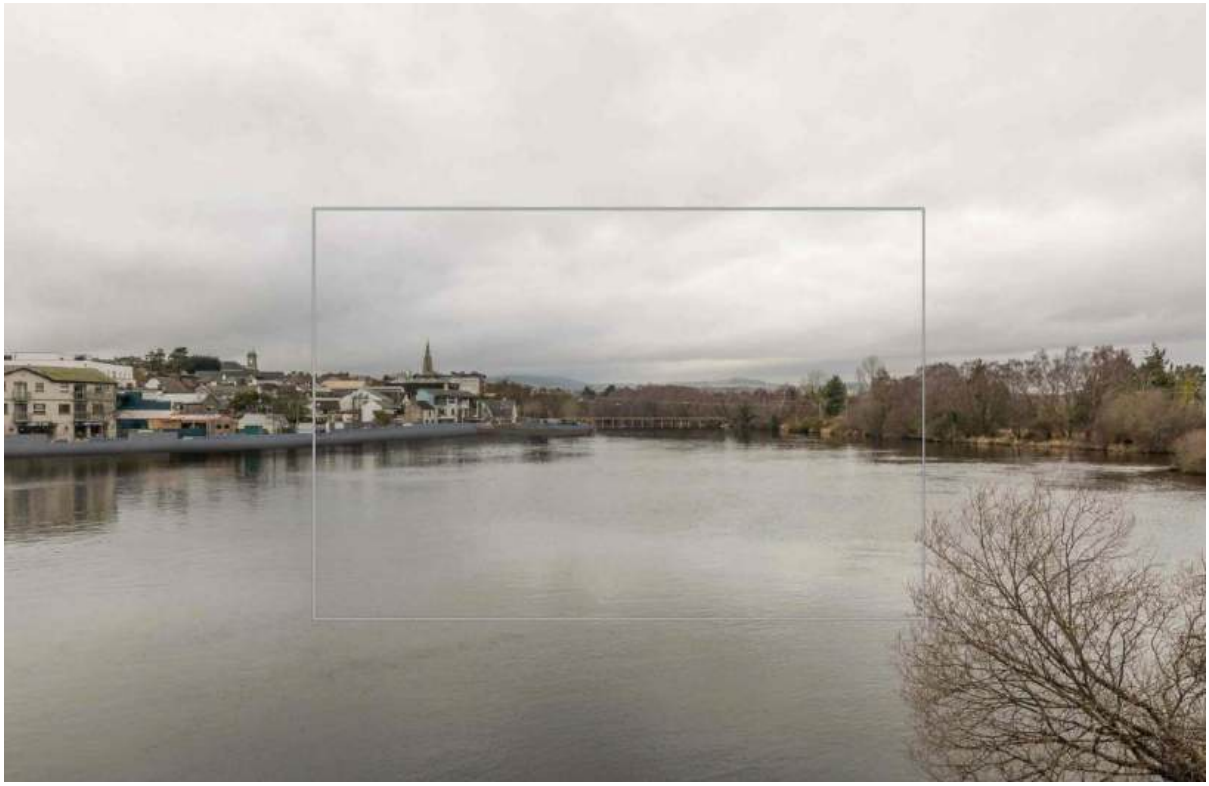


Figure 10:18 Baseline and Proposed View from the Nineteen Arches Bridge looking west

Existing View	View 16 is taken from the Nineteen Arches Bridge over the Avoca River looking west. The Avoca River is in the foreground with the boundary to Arklow Marsh along the northern bank marked by dense, mature trees and planting, restricting views of the Marsh and the development site. Along the southern bank is the RiverWalk and the northern extent of the Town Centre with a variety of uses and building types and scales. Higher up to the rear is the Main Street and a number of urban landmarks are visible including St. Saviour's Church of Ireland Church and St. Mary's & Peter's Catholic Church. In the background west of the town Croghan Mountain and the Raheenleagh Windfarm is visible.
Sensitivity	Medium-High
Proposed View	The proposed view shows the pedestrian/cyclist bridge across the Avoca River sitting atop the debris trap columns and public realm improvements along RiverWalk which are already permitted under the Arklow Flood Relief Scheme (Planning Ref. ABP-310368-21).
Magnitude of Change	The magnitude of change as a result of the infrastructure permitted as part of the Arklow Flood Relief Scheme (the debris trap columns across the river in particular) will be Medium. With the addition of the bridge atop the columns the magnitude of change will remain Medium.
Significance of Effects	The effects of the permitted Arklow Flood Relief Scheme works of themselves are likely to be perceived as Adverse-Neutral in the short term. This significance of impact would be sustained with the inclusion of the pedestrian/cyclist bridge. However the impact will reduce over time and the significance change to Beneficial as these

	infrastructural interventions compose into the urban context and provide significant amenity value and connectivity for the town.

View no. 17 from St. Mary's Park, Main Street looking north

Figure 10:19 Baseline and Proposed View from St. Mary's Park, Main Street looking north

Existing View	View 17 is from St. Mary's Park in Arklow Town Centre, north of Main Street. The view looks north across the town park. Arklow Marsh and the development site are not readily visible and are screened by existing trees and planting along the northern bank of the Avoca River. In the background Kilpatrick Hill/Ballymoyle Forest, and Ballinakill Hill is visible.
Sensitivity	Medium
Proposed View	The development will not be visible from this view.
Magnitude of Change	Negligible
Significance of Effects	Neutral

View no. 18 from the Main Street Car Park looking north

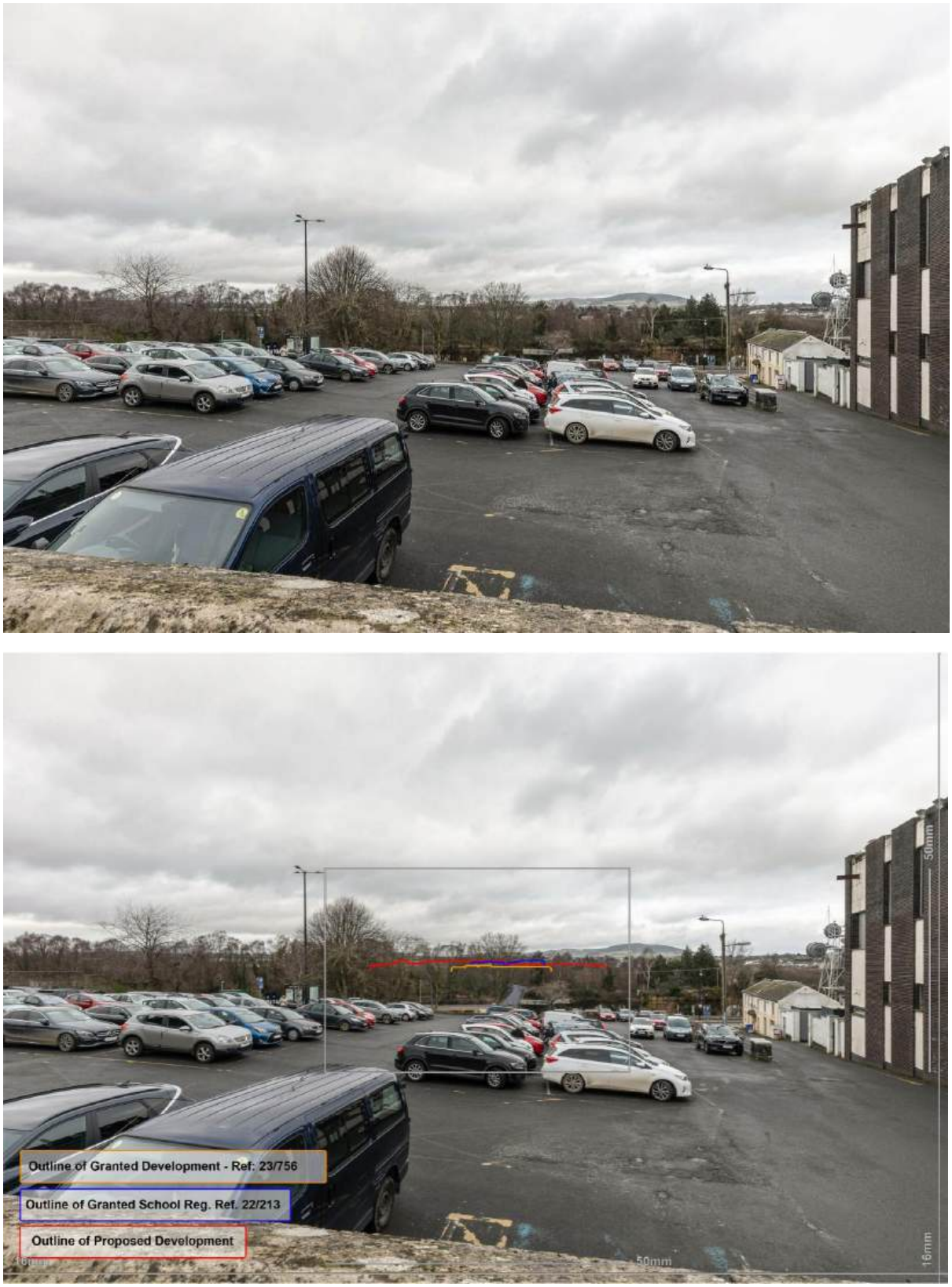


Figure 10:20 Baseline and Proposed View from the Main Street Car Park looking north

Existing View	View 18 is from Main Street Car Park which is north of St. Mary's Park, again looking north. Arklow Marsh and the development site are not readily visible and are screened by existing trees and planting along the northern bank of the Avoca River. In the background Kilpatrick Hill/Ballymoyle Forest, and Ballinakill Hill is visible.
Sensitivity	Low-Medium
Proposed View	The development will not be visible from this view.
Magnitude of Change	Negligible
Significance of Effects	Neutral

View no. 19 from the RiverWalk Trail looking east

Figure 10:21 Baseline and Proposed View from the RiverWalk Trail looking east

Existing View	View 19 is taken from along the RiverWalk trail east of Arklow Town Centre. In the centre of the view is the Avoca River with significant planting and trees on either bank. Arklow Town Centre is visible in the centre background.
Sensitivity	High
Proposed View	The proposed view shows the pedestrian/cyclist bridge across the Avoca River sitting atop the debris trap columns which are already permitted under the Arklow Flood Relief Scheme (Planning Ref. ABP-310368-21).
Magnitude of Change	The magnitude of change as a result of the infrastructure permitted as part of the Arklow Flood Relief Scheme (the debris trap columns across the river in particular) will be High. With the addition of the bridge atop the columns the magnitude of change will remain High.
Significance of Effects	The effects of the permitted Arklow Flood Relief Scheme debris trap columns of themselves are likely to be perceived as Adverse-Neutral in the short term. This significance of impact would be sustained with the inclusion of the pedestrian/cyclist bridge. However, the impact will reduce over time and the significance change to Beneficial as these infrastructural interventions compose into the urban context and provide significant amenity value and connectivity for the town.

10.6 Potential Cumulative Impacts

The Wicklow County Development Plan 2022-2028 allows for a development of this nature on this site and extending across adjacent lands to the East. The 2019 Estuary West Masterplan provides guidance to this development. Cumulative landscape effects would be *Significant* but *Neutral* reflecting the landscape context and delivery of policy objectives locally.

10.7 Mitigation Measures

Construction Phase Mitigation Measures – Landscape and Visual

Construction Stage will be programmed over a number of years resulting in ongoing infrastructure, building and related works for some period of time. These are generally destructive and visually adverse in nature, but temporary and short term. Best practice site management will be employed including appropriately scaled and located hoarding to screen the site from viewers to the north and east of the site.

Operational Phase Mitigation Measures – Landscape and Visual

Avoidance and mitigation by design were incorporated into the design. A Landscape Masterplan was prepared in order to maximise retention of the most important landscape elements, to create a design with a strong sense of place, and to avoid and reduce landscape and visual effects.

The Design Strategy incorporates the Development Plan policies and objectives contained in the Estuary Masterplan outlined in Section 10.3. These are incorporated into the Landscape Masterplan (illustrated in Figure 10.1). A balance between built form and open space is proposed, which enhances the legibility and the permeability of the site and contributes to place-making in a newly evolving neighbourhood. The Landscape Masterplan includes the following elements which reduce the landscape and visual effects.

In summary, the retention of trees is proposed where possible. Key areas include the area along the Broadmeadow river, and the retention of the majority of trees here will assist in creating a pleasant public open space and important green link, as well as screening the development from the north, as seen in Viewpoints 10 and 11. The north-south link which includes the retained hedgerow is smaller in scale, but will assist in breaking up the space internally, as well as being viewed as a green space as shown in Viewpoint 7.

10.8 Predicted Impacts

Construction Phase

The existing landscape and visual character will change during the construction stage due to site clearance, various construction activities including transport to and from the construction site. Form and appearance will change, mostly due to site boundary treatment such as hoardings and gates, further site facility management for machinery and equipment. These impacts are considered temporary and short term, with partly adverse effects.

Operational Phase

The landscape and built form design incorporates avoidance and mitigation measures to reduce adverse impacts, and where possible, to enhance the natural elements of the existing landscape, contributing to new placemaking and reflecting local policy objectives.

In assessing the landscape and visual effects of the proposed development regard must be had to the Action Area Plan for the lands (AAP3, as previously agreed in writing with WCC) and the associated Masterplan for the overall lands (also permitted as part of the Phase 1 permission (WCC Reg. Ref.:23/756) / ABP Reg. Ref.: ABP-319604-24) which provide detailed guidance for the proposed development layout and, reflects an appropriate analysis of site opportunities and best practice, that has fully informed the proposed layout and design.

Landscape Effects

The changes to the physical landscape of the main development site will result in a *Medium* to *Low* landscape effect overall. This reflects the relatively few sensitive landscape receptors on/adjoining the main development site, and the significant enhancement provided in the comprehensive landscape plans and careful siting and scaling of the development.

The more pronounced effects are on the overall character of the main development site as it changes from rural to urban, and the effect of the new buildings (where visible) on the immediate surrounds of the site.

The quality of the effect on the physical landscape features is, in the main, considered *Beneficial*, as these spaces are enhanced, and opened up with greater permeability between the site and its surrounds, and an increase in passive surveillance. The removal of field boundaries within the development site can be seen as an initially *Adverse* effect, however, this is mitigated by the proposed significant tree and landscape planting as this establishes over time.

A *High* landscape effect will result from the proposed pedestrian/cyclist bridge/boardwalk in the context of the Avoca River and Arklow Marsh. However, having regard to the elegant design of the structures and when considered within the urban context, in conjunction with the Arklow Flood Relief Scheme works, the impact will ultimately be *Positive* and *Beneficial* with this new sustainable transport infrastructure adding significant amenity value and connectivity for the town.

Visual Effects

Visual Effects of the main residential and local center development as illustrated by the Photomontages above, show no Adverse effects, with the development being *Neutral* to *Beneficial.*

Views of the pedestrian/cyclist bridge across the Avoca River, in conjunction with the permitted Arklow Flood Relief infrastructure are likely to be perceived initially as *Adverse* from proximate viewpoints and *Adverse-Neutra*l from more distant locations. However, the impact is considered will change over time and will become *Beneficial* as the new bridge settles into the urban context and provides significant amenity value and connectivity for the town.

10.9 'Do Nothing' Scenario

The Do-Nothing impact refers to the scenario of not implementing the proposed development. The primary effect of this would be that the impacts and effects identified would not directly occur. In this regard the following issues are relevant:

In the absence of this development the changes in the landscape and visual quality of the environs would be limited. The proposed development site would remain unused and remain as open pasture lands or decline / become overgrown while the objectives of the adopted Arklow and Environs Local Area Plan for the area would not be realised.

10.10 Worst Case Scenario

The Worst-Case scenario would be for the development not to proceed and a "Do-Nothing Scenario" to persist, or for the development to progress in an incomplete way e.g. landscape proposals fail resulting in the development failing to integrate as well as it could. In such a scenario the effects would be as described above in the Short Term, but this could be mitigated by carrying out landscape proposals to reinstate the streetscape and enhanced landscape capacity intended.

10.11 Monitoring & Reinstatement

Construction Phase

All works will be carried out in accordance with drawings approved at planning and supervised by appropriate professionals to completion.

Operational Phase

Once complete the development would be managed by a range of end-users into the future.

10.12 Difficulties in Compiling Information

Difficulties in the preparation of this assessment chapter were not encountered.

10.13 References

Department of Environment, Heritage and Local Government, 2000. Landscape and Landscape Assessment – Consultation Draft of Guidelines for Planning Authorities.

EPA, 2017. Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports.

Wicklow County Council 2022, Wicklow County Development Plan 2022-2028

Landscape Institute/Institute of Environmental Management and Assessment, 2013. Guidelines for Landscape and Visual Impact Assessment, 3rd Edition.

11. Traffic and Transportation

11.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development on Traffic and Transport. The chapter provides the following:

- An overview of the receiving environment
- A detailed and robust assessment of the potential impact of the proposed development on the local road network both during the short-term construction phase and long-term operational phase
- Outlines mitigation measures to ensure significant effects are minimised or avoided

It should be read in conjunction with the Traffic & Transport Assessment which also accompanies the planning application, which is included in **Appendix 11** of this EIAR.

This Chapter has been prepared by Glen Moon MA (Hons) TPP, a Principal Engineer with SYSTRA. Glen is a Chartered Member of the Chartered Institute of Highways and Transportation, with 15 years of industry experience, specializing in the field of Development Planning, Traffic & Transportation Assessments and EIAR appraisal. In addition, he has spent five years in the renewables industry as an EIA Senior Project Manager.

11.2 Methodology

Relevant Legislation & Guidance

This chapter has been prepared with cognisance of the following guidelines:

- Guidelines on the Information to be contained in Environmental Impact Assessment reports (EPA, 2022);
- PAG Unit 5. 3: Travel Demand Projections (TII, 2019);
- Project Ireland 2040 – National Planning Framework;
- Transport Infrastructure Ireland's (TII's) Traffic & Transport Assessment Guidelines (2014);
- Wicklow County Development Plan 2022-2028;
- Arklow Local Area Plan 2018-2024;

Site Surveys/Investigations

Traffic surveys for this project took place on Tuesday the 3rd of September 2024.

11.3 Receiving Environment

Site Location/Designation

The development site is located on the northern side of the Avoca River in Arklow, Co. Wicklow, within the development boundary of Arklow Town, in the townland of Kilbride.

The site is currently greenfield and used for agricultural purposes. It is bounded to the north by the L6179 Kilbride Road, to the west by the M11 motorway and other undeveloped lands, to the south by the Avoca River marsh and to the east by residential developments and additional undeveloped lands. The site does not currently have a formal access point.

Figure 11.1: Site Location and Site Boundary

The site is designated within the Arklow and Environs Local Area Plan (LAP) 2018-2024 as Action Area Plan 3 (AAP3). The LAP notes that, "*Kilbride (AAP3) is identified as the location of major development in Arklow; the growth of the settlement in accordance with regional plan targets is contingent on the delivery of the major residential, employment and community services development at this location*"

Existing Pedestrian & Cycle Infrastructure

As a greenfield site, existing footpaths and cycle facilities are currently limited to those on or alongside the roads around the site. These include:

- A continuous shared footway/cycleway along a portion of the northern side of Kilbride Road, commencing in the vicinity of the proposed site access road junction and continuing east and terminating approximately 80m from the junction with the Beech Road;
- Footways of varying quality and width on both sides of the Beech Road between the junctions with Kilbride Road and the Dublin Road;
- A pedestrian and cycle facility on the R772 Dublin Road, commencing approximately 100m north of the junction with Beech Road and continuing to the M11 Junction 11 to the north (the Arklow North Pedestrian & Cycle scheme); and
- Footways of varying widths on both sides of R772 Dublin Road and Ferrybank Road between the junction with Beech Road and the Bridgewater Roundabout to the south. A signalised pedestrian crossing is provided outside St. Joseph's National school on the R772 Dublin Road.

Bus Services

The closest bus services to the site run along the R772 Dublin Road. These are:

- Bus Eireann Service 2, which operates between Dublin Airport, Arklow and Wexford at an hourly frequency throughout the week; and
- Wexford Bus Service 740A, which operates between Arklow, Wicklow Town and Dublin Airport, also on an hourly basis throughout the week.

Rail Services

Arklow Train Station is located in the centre of the town, approximately 3.2km from the site access on Kilbride Road, but approximately 750m from the proposed landing point of the Avoca River crossing on River Walk (approximately a 10-minute walk or a 4-minute cycle from this location).

Figure 11.2: Arklow Train Station location – site context

The station is served by the Dublin Connolly-Rosslare service and the DART Commuter service. The following services operate during the working week:

- 6 trains per day to Dublin Connolly (one continuing to Dundalk Clarke);
- 4 trains per day to Rosslare Europort;
- 1 train per day to Wexford O'Hanrahan; and
- 1 train per day to Gorey.

Road Infrastructure

Figure 11.3 shows the local road network, and key junctions in the vicinity of the site. The wider road network is shown in Figure 11.7 later in this section.

Figure 11.3: Local Road Network – site context

Local Road Network

Figure 11.4 shows the R772 Dublin Road / Beech Road priority junction.

Figure 11.4: R772 Dublin Road/Beech Road Junction

Beech Road is a single-carriageway road that runs in a north-westerly direction from R772 Dublin Road, passing over the M11, and linking Ticknock with Avoca. Between the R772 Dublin Road and Kilbride Road it has a speed limit of 50km/h, but beyond this a speed limit of 80km/h applies. Figure 11.5 shows the Beech Road / Kilbride Road priority junction, where Kilbride Road forms the minor arm.

Figure 11.5: R772 Beech Road/Kilbride Road Junction

Kilbride Road is a single carriageway road, with a speed limit of 50km/h. It runs east-west between Beech Road and the Avoca River Business Park, at which point the public road ends.

Figure 11.6: R772 View of Kilbride Road Junction, travelling west

Existing Traffic Flows

As part of a suite of data collection, Junction Turning Counts (JTC's) were collected at the following junctions (as shown in Figure 11.7), on Tuesday, September 3rd, 2024:

- M11 / R772 roundabouts (north and south roundabouts and slips);
- R772 Dublin Rd / L2180 Beech Rd priority junction;
- R772 Dublin Rd / De Wadden Drive priority junction;
- R772 Dublin Rd / R750 Sea Rd priority junction;
- R772 / North Quay roundabout junction; and
- R772 Bridge St / Main St / Lower Main St priority junction.

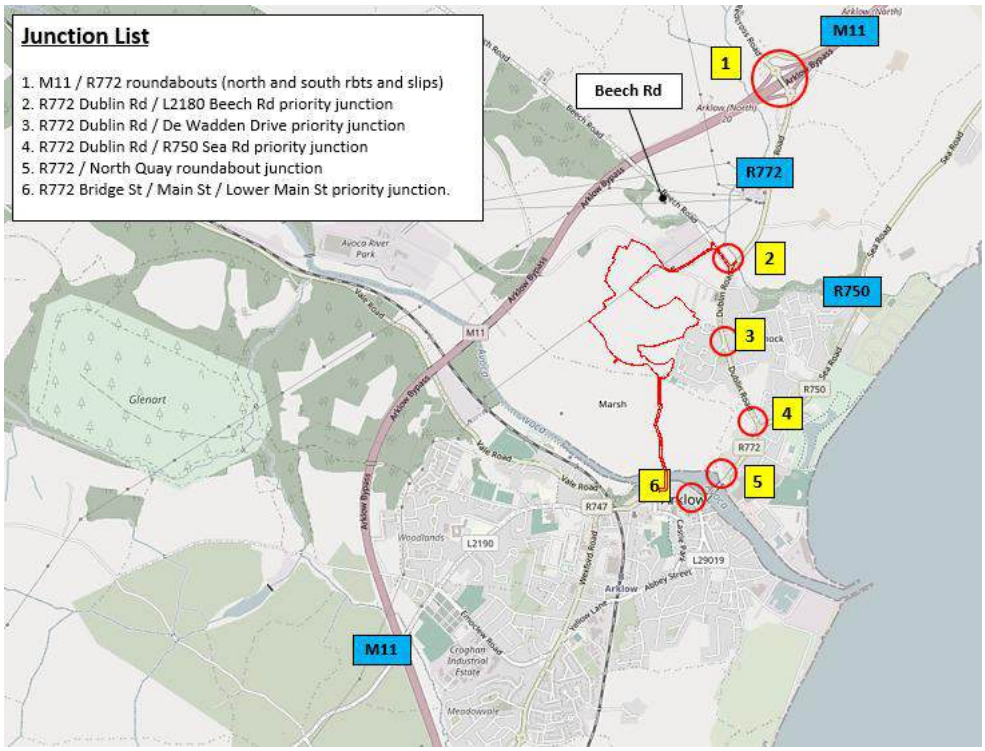


Figure 11.7: JCT Survey Locations

The identified network peak hours were;

- AM Peak: 08:15 – 09:15; and
- PM Peak: 16:45 – 17:45

Recorded traffic flows for the AM and PM peak hours are shown in Figure 11.8 and Figure 11.9. Turn Count diagrams and AADT information for every surveyed and modelled scenario are provided in the Traffic & Transport Assessment Report and AADT Tables included within **Appendix 11** of this EIAR.

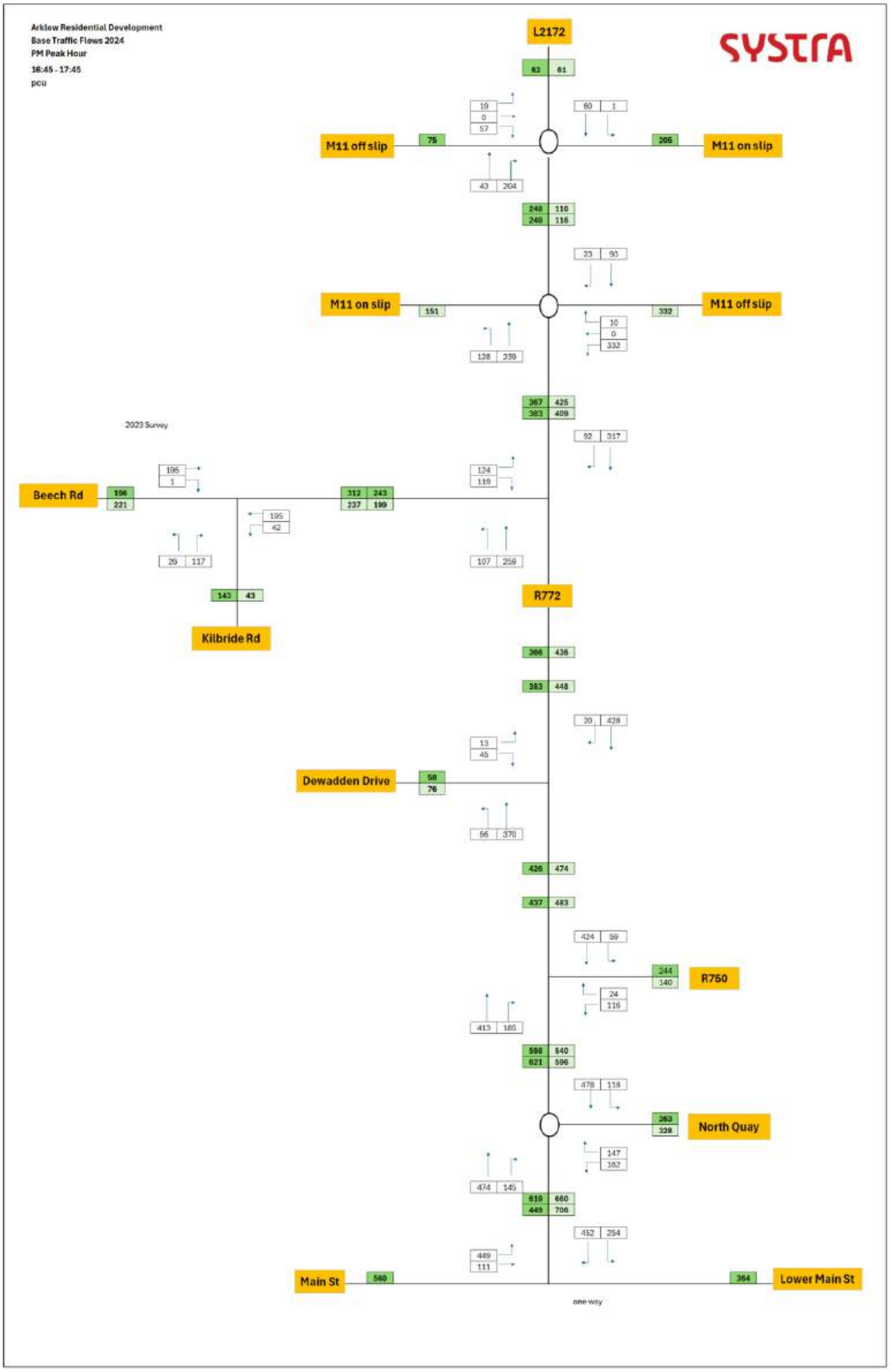


Figure 11.8: Base 2024 AM Peak Hour traffic flows (08:15 – 09:15, pcu)

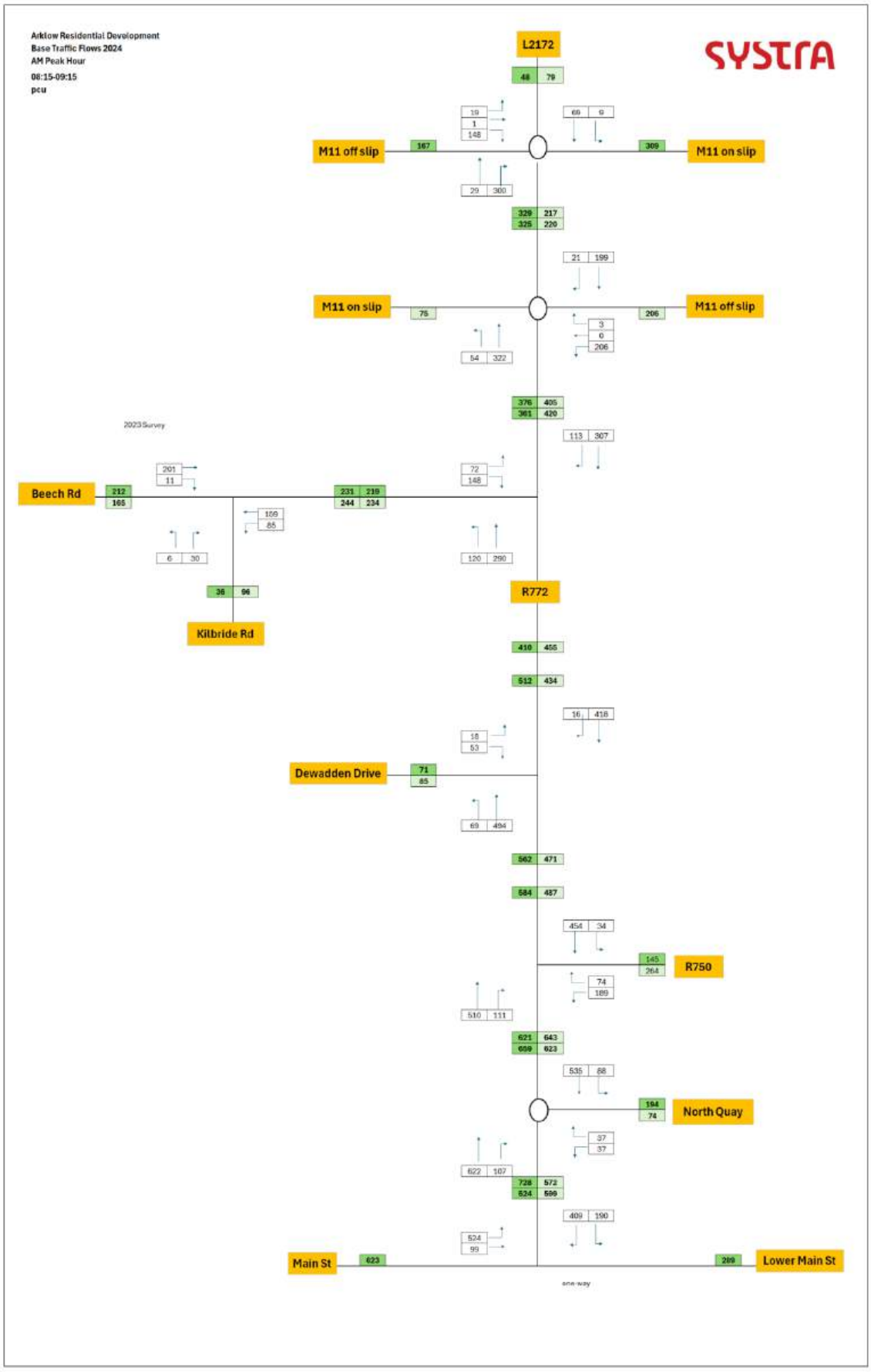


Figure 11.9: Base 2024 PM Peak Hour traffic flows (16:45 – 17:45, pcu)

11.4 Future Receiving Environment

Future Transport Initiatives

The Arklow Local Area Plan (LAP) states that '*Traffic flows on a number of the main routes within the town centre are constrained due to the restricted capacity of the junctions*.' Within the town there is currently a single crossing of the Avoca River, via the R672, that links the northern and southern sides of the town. The alternative is to travel between M11 Junctions 20 and 21 which are located to the north and south of Arklow town, but this is a much longer route.

Objective IT5 of the current LAP identifies a requirement for a 'Western Distributor Route' (WDR) to be constructed through the Kilbride lands, to incorporate a new river crossing and to link Kilbride to the Vale Road, Lamberton Avenue and the Coolgreaney Road. This is intended to alleviate traffic congestion on the existing R672 Nineteen Arches Bridge, which is the single river crossing within Arklow town.

The WDR also allows for a potential future additional interchange on the M11 as identified as **Objective IT6** in the current LAP and as a Strategic Roads Objective in the Wicklow County Development Plan (2022-2028). Both IT5 and IT6 are shown on Figure 11.10.

Figure 11.10: Transport Infrastructure Objectives IT5 & IT6 (Arklow LAP)

The WDR fulfils a wide range of local and strategic requirements:

- It forms part of initial access to the Educational Campus (see below) and the Kilbride lands, from the L6179 Kilbride Road to the north;

- It will connect to a potential new bridge crossing of the Avoca River when implemented, and onwards to connect to existing roads to the south-west of Arklow Town;
- It will provide additional resilience and capacity on the transport network (for all modes) within Arklow and support opportunities to reallocate road space within the town centre core; and
- It will be suitable to accommodate local bus services within Arklow Town, which may be provided in line with future growth of the town.

As part of the proposals for the consented Educational Campus adjacent to the site (Planning Ref: 22/213), a new access road will be constructed, which will run south from Kilbride Road into the proposed development site. Kilbride Road would be realigned, so that the new school access will have priority over Kilbride Road, which will form the minor arm of a priority junction, as shown in Figure 11.11.

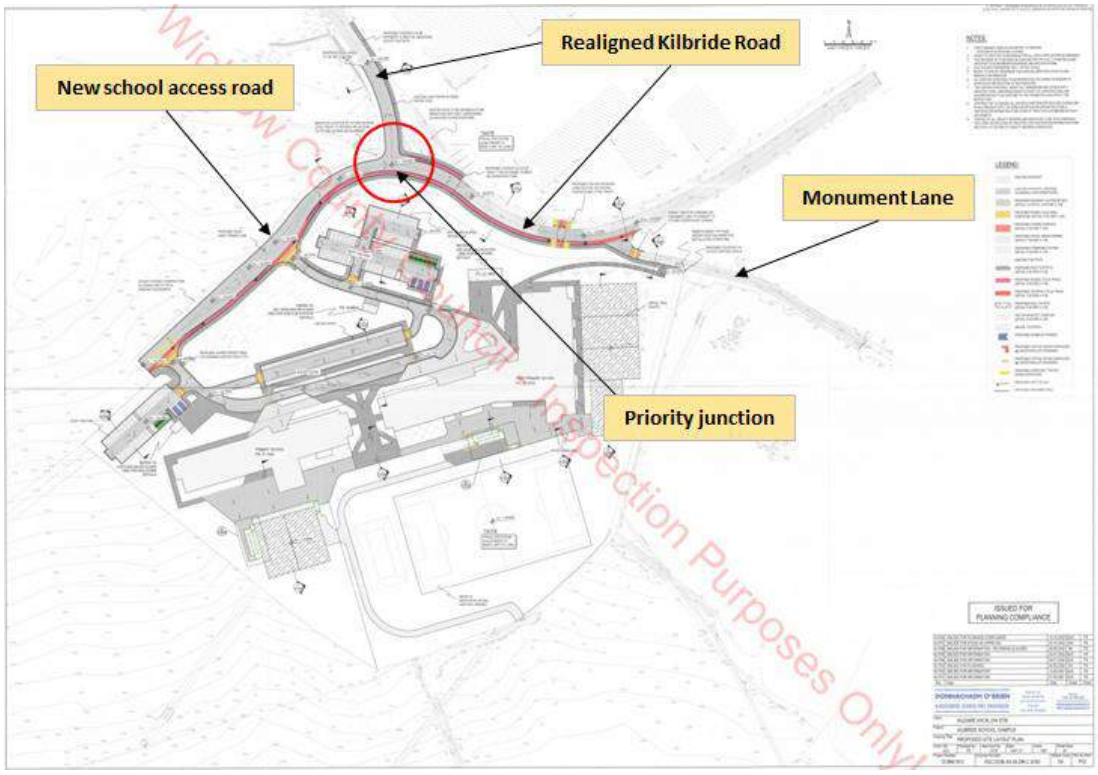


Figure 11.11: School Access Proposal (Source: Wicklow County Council Planning Portal)

This new school access road is intended to form the first part of the future IT5 'Western Distributor Route' alignment, as envisaged in the Arklow LAP, as indicated in Figure 11.10.

Greater Dublin Area Cycle Network Plan (2022)

The NTA's Greater Dublin Area (GDA) Cycle Network Plan (2022) includes proposals for cycle facilities within Arklow town, and specifically in the area of the development site, as shown in Figure 11.12.

Figure 11.12: GDA Cycle Network Plan (2022) – Site Context

The GDA cycle network plan envisages Kilbride Road and Beech Lane as Secondary cycle routes, along with the R772 Dublin Road. It envisages that the Avoca Marsh Trail, which runs in the vicinity of the site's southern boundary, will become a Greenway that will extend to meet R772 Dublin Road between Seaview Avenue and North Quay.

The boardwalk and bridge connection described in Section 11.6 of this Chapter, which will be provided as part of the development, is not included within GDA Cycle Network, but it will form an important part of the Arklow cycle network, providing a high-quality segregated pedestrian and cycle connection across the Avoca River to connect to River View and onwards to Main Street within the town centre.

Similarly, the IT5 Western Distributor Route is not included within the GDA Cycle Network but will also further improve walking and cycling connections in the area.

Arklow to Shillelagh Greenway route

The Arklow to Shillelagh Greenway is proposed to route along the southern side of the Avoca River, along the waterfront. The emerging preferred route of the Greenway in the context of the site is shown below. This is expected to progress to detailed design in 2025, with construction expected thereafter, subject to funding.

11.5 Cumulative Developments

A number of developments have been identified in the site vicinity that are of relevance, and which may have a cumulative impact alongside the proposed development. These are detailed in Table 11.1 below.

Planning Application Details		Development Description	Extent of Overlap
Planning Reference	22213	Construction of a new educational campus and a new link road that will service the school campus which will include the provision of two school buildings. Proposed site works to include the construction of all new hard play areas, six play-courts, grass pitch, 182 no. car-parking spaces together with boundary treatment, 79 bicycle stands, ancillary infrastructure works, pedestrian links and landscaping.	Included as a committed development
Status	Granted		
Location	Kilbride Educational Campus, Kilbride.		
Planning Reference	ABP 302556 18	Construction of a new wastewater treatment plant, interceptor sewers including storm water overflows and stormwater storage, sea outfall pipelines, and an upgrade to a section of the coastal revetment all in the townlands of Arklow, Tinahask Lower and Ferrybank, County Wicklow.	Development is almost completed – no material change for traffic purposes
Status	Granted		
Location	Arklow, Co. Wicklow		
Planning Reference	24325	7-year permission for a Large-Scale Residential Development. The proposed development will consist of the following: Construction of 476 no. residential units, Communal open space and public open space in the form of 13 no. local parks. Provision of 930 no. car parking spaces, 400 no. bicycle parking spaces for residents and 37 no. visitor bicycle parking spaces.	Development area of influence and submitted analysis does not send traffic north of Arklow town – access to M11 is possible on the south side. Background traffic growth will account for this development.
Status	Granted		
Location	South of Arklow Town		
Planning Reference	23756	84 no. residential units with a mix of detached, semi-detached, terraced houses and duplex apartments ranging in height from 2 to 3 storeys; comprising of 8 no. 1-bed and 8 no. 2-bed duplex apartments, 10 no. 2-bed houses and 60 no. 3-bed houses.	Included as a committed development, as it will be delivered in tandem with Phase 1 of this proposed development.
Status	Granted		
Location	Lands at Kilbride, Arklow, Co. Wicklow		
Planning Reference	2484	Construction of 99 residential units comprising 59 no. apartments with four blocks, construction of a 350 sqm mixed use building of four storeys containing 350 sqm of retail space at ground floor and residential units above; refurbishment, extension and change of use from a derelict two storey house to a 146.3 sqm creche; 169 no. car parking spaces and 196 no. bicycle parking spaces provided at basement and surface level.	Proposed development is accounted for in background traffic growth. Supporting analysis indicates low additional trips over Nineteen Arches bridge.
Status	Granted		
Location	Upper Main Street, Arklow, Co. Wicklow		

Planning Reference	24352	Construct 74 No. Social Housing Units and all associated works. The accommodation shall consist of the following: 2 No. four bedroom storey and a half units, 17 No. three bedroom two storey units, 45 No. two bedroom two storey units, 2 No. one bedroom apartments in a two storey unit and 8 No. one bedroom single storey units.	Outside area of influence, covered by background traffic growth.
Status	Granted		
Location	Tinahask, Townland of Tinahask Upper, Arklow, Co. Wicklow		
Planning Reference	2460284	Discount Foodstore Supermarket with ancillary off-licence sales on an extended site. The proposed development comprises: 1) The demolition of existing single storey Discount Foodstore (with ancillary off-licence use) measuring c. 1,357 sqm gross floor space with a net retail sales area of c. 985 sqm; 2) The demolition of existing 1 no. two storey and 2 no. single storey commercial buildings measuring c. 1,191 sqm overall and associated and ancillary site clearance of former Healy Premises; 3) The construction of a single storey Discount Foodstore Supermarket with ancillary off-licence use (and mezzanine plant deck) measuring c. 2,290 sqm gross floor space with a net retail sales area of c. 1,452 sqm.	The development represents a refurbishment of an existing discount retail store. It is considered that the additional trips associated with this would be accounted for already on the network (pass-by trips) and would also not be significant enough to impact the site.
Status	Granted		
Location	Lidl, Wexford Road, Arklow, Co. Wicklow, Y14 HY80		
Planning Reference	24285	Construction of 3 no. detached houses with new access entrance and connection to existing services.	No impact.
Status	Granted		
Location	Knockenrahan Upper, Wexford Road, Arklow, Co. Wicklow		
Planning Reference	23843	The proposed development includes an amendment to the development permitted under Reg. Ref. 21/1080, The proposed development will provide for a revised energy centre design, to include the provision of 8 no. gas turbines (with associated flues of 25.15m in height), 4 no. black start emergency generators and associated transformers, 2 no. single storey fuel oil pump rooms with a gross floor area (GFA) of 90.17sq.m, a single storey air compressor building with a GFA of 88.9sq.m, 4 no. fuel tanks, 2 no. MCC control rooms with a GFA of 44.17sq.m, 3 no. fire water tanks, a single storey welfare, storage, and pump room building	The proposed development will, when operational, will have 6 parking spaces and 4 bike parking spaces. Low traffic generator at operational stage – no impact. The trips are accounted for in background traffic growth.
Status	Granted		
Location	Site at Avoca River Park, Arklow, Co. Wicklow		

		with a combined GFA of 160.97 sq.m, a two storey MV /LV building with a GFA of 655.54sq.m, 8 no. 11kV/ 33kV step-up transformers in the north of the site, water treatment equipment, and a security hut, all within a fenced compound.	
Planning Reference	23381	Demolition of the existing three storey detached office building (646 sqm) and single storey outbuilding (30 sqm); and the construction of a new five storey apartment block (3,196 sqm GFA) comprising of 34 No. apartments (14 No. one-bed apartments and 20 No. two-bed apartments)	Outside the area of influence, with low traffic generation.
Status	Granted		
Location	Arklow Shipping premises, North Quay, Arklow, Co Wicklow		
Planning Reference	2372	The proposed development consists of the following: Demolition of the existing structures on site (industrial structures and outbuildings) and site clearance works; construction of 3 no. three storey information and communication technology (ICT) facility buildings, each with a gross floor area (GFA) of c. 16,206 sq.m (c. 48,618sq.m GFA in total), and with a parapet height of c. 19.5 metres; each of the 3 no. ICT buildings will accommodate ICT equipment rooms, mechanical equipment rooms, staff welfare facilities, ancillary office space, security rooms, storage, and loading bays; a customer compound, a power trunk building, a transformer compound and a water tank compound area are provided to the north of the ICT facility buildings;	Construction has not commenced. The operational traffic as indicated in the supporting analyses is low during peak periods and is accounted for in background traffic growth.
Status	Granted		
Location	Site located at Avoca River Park, Arklow, Co. Wicklow		
Planning Reference	22433	the installation of underground electrical infrastructure between the existing Arklow Gas-insulated Switchgear (GIS) 220kV Substation and the permitted Pollahoney GIS Substation. This will include the installation of approximately two underground electricity cable circuits, each at 3.12km in length and associated underground ducting, horizontal directional drilling, joint bays, communication cabling infrastructure between the existing Arklow GIS 220kV Substation and the permitted Pollahoney GIS substation, (WCC reg ref 20/1285).	Indicated traffic change will be minor and only for 5-month temporary duration. This has not been included in the analysis.
Status	Granted		
Location	Townlands of Killiniskyduff, Tiknock, Kilbride, and Shelton Abbey		

Table 11.1: Cumulative Developments

Of the developments identified above in Table 11.1 that are included in this assessment, the proposed Educational Campus is assumed to be constructed and operational by the 'Opening Year +5' scenario (2032).

The proposed 84-unit residential development will form part of the initial phase of residential development at the LRD site and is included within the 'Opening Year' scenario (2027).

The adjacent ICT facility and Energy Centre developments are located to the west of the site, crossing over the M11 via the Kilbride Road. Although the developments at both sites have planning permission, neither site has commenced construction at this time. It has been assumed therefore that these sites will not be under construction or operational in the 'Opening Year' scenario in 2027, but it is assumed that both developments will be constructed and operational by the 'Opening Year +5 scenario in 2032. As both of these developments have low traffic flows during the morning and evening peak periods, it has been assumed that background traffic growth applied to the existing traffic flows between 2024 and 2032 will account for these developments.

11.6 Characteristics of the Proposed Development

The proposed mixed use Large scale Residential Development will result in the demolition of an existing dwelling and 2 no. sheds/outbuildings and the construction of 666 no. residential units with a mix of semidetached and terraced houses along with duplex apartments and apartments. These will comprise 1, 2, 3 and 4 bed units. All residential units will have associated private open space facing north/ south/ east/ west. The proposal will also deliver a local centre containing 3 no. retail units, 3 no. community/ medical units and 1 no. creche unit.

A new pedestrian/ cyclist link is provided via a new boardwalk and bridge across the marsh and over the Avoca River adjoining the existing greenway and the Main Street. A new road providing vehicular access is also proposed connecting to the north to Kilbride Road along with road improvements in the surrounding area.

The development will also provide for landscaping, public open spaces and all associated site development works to enable the development including boundary treatments, attenuation storage area and other service provision including ESB works.

Vehicle Access to Site

Direct vehicle access to the site will be via the Kilbride Road, which will be realigned and have the existing priority changed, so that the link into the Kilbride Education Campus and LRD site access becomes the priority route.

The majority of traffic to and from the site will travel to Kilbride Road via the R772 Dublin Road/Beech Road priority junction, which will be upgraded to a signalised junction in line with the site build-out (the junction will remain a priority junction for the development Opening Year in 2027 but will be upgraded to a signalised junction in advance of the Opening Year +5 scenario in 2032).

The proposed signalised layout at this junction would provide:

- Single lane approaches on both arms of the R772, with space within the junction for 1-2 vehicles turning right into Beech Road to wait without blocking southbound traffic on the R772;

- A single lane plus short flare approach on Beech Road, with sufficient stacking room for approximately 6 vehicles; and
- A pedestrian crossing across the Beech Road arm of the junction. It has been assumed that this would be called very infrequently throughout the day, as there is predicted to be little pedestrian demand to cross Beech Road, even with the School and Development in place. Pedestrian access to both the school and residential development will be taken through the south and south-east of the development site.

Assessment Scenarios

Subject to planning, construction is expected to commence on site in 2025, and will peak in 2026, which is the assumed 'Construction Phase' assessment year. The first tranche of residential units is expected to become occupied in 2027, which is therefore the development 'Opening Year'. For assessment purposes, the 'Opening Year +5' scenario will be in 2032, and the 'Opening Year +15' scenario will be in 2042. The proposed Boardwalk connection across the Avoca River to Arklow Town is expected to be delivered by 2029, and as such will not be in place as part of the initial phase of development expected to open in 2027 but is assumed to be in place prior to Opening Year +5.

The envisaged assessment scenarios and delivery timelines for the development components outlined above is set out below in Table 11.2.

Assessment Year	Activity	Elements Delivered
2026 Construction Year	Construction of supporting road infrastructure and the construction of the 84 units that have an existing grant of planning, and an additional 29 units of the proposed development (i.e. a total of 113 units delivered)	Internal road infrastructure and initial 113 units under construction, along with connection to Marshland Sports Club and Avondale Crescent
2027 Opening Year	First 113 units delivered, with ongoing construction for delivery of latter phases of residential development and proposed Local Centre	113 residential units delivered (84 units with existing grant and 29 units of the proposed development). Local Centre and Boardwalk connection to Arklow Town not delivered
2032 Opening Year +5	Additional 387 units delivered with construction ongoing on remaining units. Proposed Local Centre and Boardwalk connection to Arklow Town delivered	500 residential units total (84 units with an existing grant and 416 units of the proposed development), Local Centre and Boardwalk Connection also delivered
2042 Opening Year +15	Remaining 250 units delivered, including all supporting elements. Construction work completed	750 residential units total (84 units with an existing grant and the full 666 units associated with the proposed development), all supporting road infrastructure, the proposed Local Centre and Boardwalk Connection to Arklow Town all delivered

Table 11.2: Assessment Scenarios

11.7 Potential Impacts

Construction Phase

Construction traffic trips and distribution associated with the proposed development is outlined in the Traffic & Transport Assessment in **Appendix 11** of this EIAR:

The total construction traffic flows associated with the development are summarised as follows:

- Daily Two-Way Traffic – **440 two-way vehicle trips** (190 vehicles arriving, 190 vehicles departing, 30 HGVs arriving and 30 HGVs departing);
- AM Peak (07:00-08:00) – **116 two-way vehicle trips** (100 vehicles arriving, 10 vehicles departing and 3 HGVs arriving/departing);
- PM Peak (16:00-17:00) – **66 two-way vehicle trips** (10 vehicles arriving, 50 vehicles departing and 3 HGVs arriving/departing).

The above construction traffic profile is assumed to remain present on site in the Opening Year of 2027 and Opening Year +5 in 2032, but construction will have concluded by 2042 (Opening Year +15) and this traffic will therefore not be present.

Arm	Pre-AM Peak Hour (07:00-08:00)			Pre-PM Peak Hour (16:00-17:00)		
	Queue (pcu)	Delay (s)	RFC	Queue (pcu)	Delay (s)	RFC
Base 2027 + Peak Construction Traffic						
Beech Road LT	0.2	8.0	13%	0.6	12.3	35%
Beech Road RT	0.2	12.6	17%	1.0	19.8	49%
Dublin Road	0.7	10.2	33%	0.4	6.7	20%

Table 11.3: Dublin Road / Beech Road Peak Construction Trips Junctions 11 Results

Analysis undertaken at the Beech Road/Dublin Road junction, shown above in Table 11.3 indicates that the junction has sufficient capacity to accommodate the proposed development construction traffic flows during the morning and evening peak periods. The scheduling of construction shift commencements prior to the local network morning peak ensures that the construction-related arrivals to and from the site do not overlap, whilst in the evening the phased departure of site traffic ensures that the potential impact on the junction is minimal.

Operational Phase

Trip Generation and Distribution

The TRICS database was consulted to derive trip rates for the proposed development. Person trip rates were identified and used in addition with a proposed mode split at the site to develop the overall trip generation for the proposed development.

Although the Local Centre may generate a small amount of external trips, the vast majority of travel demand to / from the local centre is expected to come from within the site, and therefore these trips have been assumed to be either pass-by trips (people travelling to or from the centre as part of another journey), or walking and cycling trips retained within the site.

The full TRICS reports are provided in the Traffic & Transport Assessment included within **Appendix 11**.

The peak travel hours for the development will be 08:00 – 09:00 and 17:00 – 18:00.

Table 11.4 presents the resultant number of person trips, based upon the full quantum of development of 750 units (inclusive of the already-permitted 84 units).

Time	House People Trip Rates			Flats People Trip Rates			Total Person Trips		
	Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total
07:00-08:00	70	319	389	5	28	33	76	347	422
08:00-09:00	144	495	638	8	41	49	152	535	687
09:00-10:00	130	164	294	15	23	37	144	187	331
10:00-11:00	107	133	240	14	18	32	121	151	272
11:00-12:00	116	130	246	10	17	28	126	148	274
12:00-13:00	139	136	275	16	15	31	155	152	306
13:00-14:00	142	125	267	13	15	28	155	140	295
14:00-15:00	152	161	313	16	15	31	168	176	344
15:00-16:00	330	168	498	23	12	35	352	180	533
16:00-17:00	322	163	485	24	12	35	346	174	521
17:00-18:00	377	177	554	32	14	46	409	191	600
18:00-19:00	307	172	479	26	15	40	332	187	519
Total	**2,336**	**2,343**	**4,680**	**201**	**225**	**425**	**2,537**	**2,568**	**5,105**

Table 11.4: Total Person Trips

Table 11.4 shows that the development is expected to generate over 5,100 two-way trips over the course of a typical 12-hour day, with 687 two-way person trips in the AM peak hour, and 600 two-way person trips in the PM peak hour.

Current Modal Split

The prevailing mode share for the site vicinity, was determined from the recorded 2022 modal split for the Census 'Small Area' which the site sits within (Ref. 257079010) and is presented in Table 11.5. This baseline modal split for the site is based upon existing car use in areas in the vicinity, existing walking and cycling infrastructure, and public transport services.

Mode	Mode Split		
	Work	School	Work + School Combined
Walking	10%	29%	18%
Cycling	2%	3%	2%
Car Driver	70%	2%	41%

Car Passenger	7%	58%	28%
Bus, minibus or coach	3%	8%	5%
Other	8%	1%	5%
Total	**100%**	**100%**	**100%**

Table 11.5: Small Area Statistics – Journeys to Work + Education Modal Split

Table 11.5 shows that for work-based trips, 70% of journeys are made as a car driver. This falls to 41% when trips to both work and school are considered.

For robustness, it has been assumed that the prevailing 70% car mode share will apply to the site as part of the initial phase of development in the Opening Year of 2027. This is due to the fact that the proposed Local Centre and the proposed Boardwalk connection to Arklow Town will not be implemented as part of the first phase of development at the site but will be in place as subsequent phases are implemented.

Future Modal Split

As set out above, as part of the development a Boardwalk and shared pedestrian/cycle bridge connection will be provided across the Avoca River, between the development and the town centre, greatly improving active travel connections to the site. The practical effects of this will be to:

- Reduce walking time between the site and town centre to around 10 minutes; and
- Reduce cycling time between the site and town centre to less than 5 minutes.

The proposed Local Centre and the facilities contained therein will also offer residents at the site local options that reduce the need to travel by car. The Boardwalk and the longer-term development of the Western Distributor Road will mean that walking, cycling and public transport between the site and the town centre will be faster, and more attractive than at present.

Based on this, a future 'target' modal split has been developed, which takes account of this increase in non car-based trips. For a robust approach, the starting point of this has been based on the Census 2022 'Work' mode split. This is set out in Table 11.6.

Mode	Census JTW Mode	Target Mode Split	AM Peak Hour		PM Peak Hour	
			Inbound	Outbound	Inbound	Outbound
Walking	10%	15%	23	81	62	29
Cycling	2%	6%	9	32	25	12
Car Driver	70%	55%	84	296	226	106
Car Passenger	7%	12%	18	65	49	23
Bus	3%	10%	15	54	41	19
Other	8%	2%	3	11	8	4
Total	**100%**	**100%**	**153**	**539**	**412**	**192**

Table 11.6: Target Mode Split and trips by mode

It is noted that in terms of 'Car Driver' (which in effect is the number of vehicle trips generated by the development), the target mode share of 55% sits between the Census 'Work' and 'Work and School Combined' calculated car mode share.

The 'target' mode split has been used in the operational phase assessments for the Opening Year +5 and Opening Year +15 assessment scenarios presented below. This is considered to be a reasonable reflection of the likely future modal split for travel from the site, taking into account current car use and improved sustainable travel links being implemented as part of the development, along with co-location with the proposed Local Centre and the adjacent Education Campus.

The results of the junction assessments undertaken at key relevant junctions and under the various scenarios are presented in full in the Traffic & Transport Assessment Report included in **Appendix 11**. The assessments are summarised below.

Beech Road/R772 Dublin Road Junction

In the 2027 Opening Year, this junction will remain a simple priority junction. The results of the assessment are presented below in Table 11.7.

Arm	AM Peak Hour (08:15-09:15)			PM Peak Hour (16:45-17:45)		
	Queue (pcu)	Delay (s)	RFC	Queue (pcu)	Delay (s)	RFC
Base 2024						
Beech Road LT	0.2	10.0	17%	0.3	9.2	25%
Beech Road RT	0.8	17.4	43%	0.6	15.8	36%
Dublin Road	0.7	7.4	29%	0.5	6.7	24%
Base 2027						
Beech Road LT	0.3	10.6	20%	0.5	11.4	32%
Beech Road RT	0.9	19.4	47%	0.9	19.6	45%
Dublin Road	0.9	7.8	34%	0.7	7.2	30%
Base 2027 + Development (113 Units)						
Beech Road LT	0.4	13.0	27%	0.5	11.7	35%
Beech Road RT	1.5	25.7	60%	1.1	22.0	51%
Dublin Road	0.9	8.0	35%	0.9	7.7	34%

Table 11.7: Dublin Road / Beech Road 2027 Opening Year Junctions 11 Results

Table 11.7 above indicates that with traffic growth and the first phase of the development in place the priority junction arrangement will continue to operate within capacity.

The existing priority junction will need to be upgraded to signal control to accommodate future traffic growth, the school and the Phase 1B development at the site. The upgrade is anticipated to occur between 2027 and 2032. The results of the junction assessment for the 2032 Opening Year +5 and 2042 Opening Year +15 scenarios are presented below in Table 11.8.

Arm	AM Peak Hour (08:15-09:15)			PM Peak Hour (16:45-17:45)		
	Queue (pcu)	Delay (s)	RFC	Queue (pcu)	Delay (s)	RFC
Base 2032 (+ School)						
Dublin Road (S)	12.5	17.8	52.5%	7.7	16.3	36.8%
Beech Road	9.7	40.7	62.1%	4.6	34.5	44.9%
Dublin Road (N)	14.0	27.9	60.8%	9.9	19.3	45.2%
Base 2032 (+School) + Development (500 units)						
Dublin Road (S)	14.5	23.3	59.1%	10.4	17.8	46.5%
Beech Road	15.5	40.6	75.2%	6.8	36.2	54.8%
Dublin Road (N)	17.3	41.9	76.5%	12.8	24.8	55.9%
Base 2042 (+ School)						
Dublin Road (S)	13.1	18.1	54.2%	7.8	15.3	37.3%
Beech Road	9.8	40.9	62.5%	4.3	35.7	42.6%
Dublin Road (N)	14.5	28.4	62.2%	9.3	17.4	42.7%
Base 2042 (+School) + Development (750 units)						
Dublin Road (S)	16.0	25.7	63.2%	12.0	17.6	51.3%
Beech Road	19.6	44.6	83.0%	7.5	38.7	58.2%
Dublin Road (N)	19.5	51.6	84.6%	13.5	25.3	58.0%

Table 11.8: Dublin Road / Beech Road 2032 and 2042 LinSig Results

Table 11.8 shows that the junction is expected to operate within capacity in all of the assessed scenarios. The AM peak hour is the busiest period, as this is the time when school traffic is arriving and departing, and also when trips out of the development are highest.

The analysis shows that the junction is expected to be approaching capacity in 2042, when 750 units are built on site. In particular in the AM peak hour, the Dublin Road is expected to have an RFC of 84.6%.

The proposed junction upgrade to signal-control will result in a greater degree of priority offered to the Beech Road approach arm when implemented. It is noted that in the AM peak period in particular, the signalisation allows for better optimisation of green time to accommodate the increased flows on the Beech Road. Both the Beech Road and Dublin Road southbound approaches to the junction are seen to remain within their theoretical capacities due to the proposed signal control and intelligent operation.

The proposed signal-controlled layout represents an interim upgrade to the junction which is sufficient to accommodate the proposed development. In the longer-term, in the event of further development within the AAP3 lands and/or the implementation of the Western Distributor Road, the additional traffic flows and potentially displaced traffic from Arklow Town Centre will ultimately require additional upgrades to be implemented at this junction.

The proposed layout also includes for a limited amount of space to accommodate right-turning vehicles from the Dublin Road to the Beech Road, for 1-2 waiting vehicles. The number of right-turning vehicles associated with the proposed development at this junction will not be significant in the AM peak period; rather the proposed school development is the main generator of additional right-turning traffic at this junction in this period.

A sensitivity test has been undertaken for the junction in the 2032 and 2042 scenarios, with the mode share for cars retained at the current value of 70% (as opposed to the 55% adopted in this assessment).

The results are presented in **Appendix E** of the Traffic & Transport Assessment Report included in **Appendix 11** of this EIAR.

The results of the sensitivity test show, that assuming the Census 2022 mode share remains in place:

- Junction performance slightly worsens in Phase 1B (2032), but the junction is predicted to remain within capacity; and
- The junction is predicted to operate slightly over practical capacity in the AM peak hour in 2042 (after implementation of Phase 1C).

R750 Sea Road/R772 Dublin Road Junction

The R772 / R750 junction is a simple priority junction, where the R772 forms the major arms, and the R750 Sea Road, which forms the eastern arm, must give way. Sea Road has a single-lane approach, and traffic on the R772 south waiting to turn right into Sea Road can block northbound traffic following behind. The results of the assessments for all scenarios are presented below in Table 11.9.

Arm	AM Peak Hour (08:15-09:15)			PM Peak Hour (16:45-17:45)		
	Queue (pcu)	Delay (s)	RFC	Queue (pcu)	Delay (s)	RFC
Base 2024						
Sea Road LT	0.7	11.5	40%	0.3	8.1	22%
Sea Road RT	0.4	16.5	27%	0.1	13.3	9%
Dublin Road	1.2	6.7	37%	2.2	10.6	57%
Base 2027						
Sea Road LT	0.7	12.4	43%	0.3	8.5	24%
Sea Road RT	0.4	18.0	30%	0.1	14.2	10%
Dublin Road	1.3	6.9	40%	2.7	12.0	62%
Base 2027 + Development (113 units)						
Sea Road LT	0.8	12.9	44%	0.3	8.6	24%
Sea Road RT	0.5	19.1	32%	0.1	14.6	11%
Dublin Road	1.4	7.0	41%	2.9	12.3	64%
Base 2032 (+ School)						
Sea Road LT	1.2	19.4	55%	0.3	9.0	26%
Sea Road RT	1.0	33.9	51%	0.1	15.6	12%
Dublin Road	2.6	7.9	53%	3.7	14.4	69%
Base 2032 (+School) + Development (500 units)						
Sea Road LT	1.9	30.6	67%	0.4	9.5	27%
Sea Road RT	1.7	56.7	65%	0.2	18.2	16%
Dublin Road	3.2	8.9	58%	6.3	19.5	78%
Base 2042 (+ School)						
Sea Road LT	1.5	23.6	61%	0.4	9.3	27%
Sea Road RT	1.3	42.2	58%	0.1	16.5	13%
Dublin Road	3.1	8.6	57%	4.7	17.1	74%
Base 2042 (+School) + Development (750 units)						
Sea Road LT	6.6	101.6	95%	0.4	10.2	29%
Sea Road RT	4.6	148.3	91%	0.3	22.0	21%
Dublin Road	4.5	11.0	65%	14.5	43.5	91%

Table 11.9: Dublin Road / Sea Road Junctions 11 Results

Table 11.9 shows that the junction is currently operating within capacity, and this is forecast to be the case when Phases 1A and 1B of the development are added in 2027 and 2032, respectively.

In the Base 2042 + School + Phase 1C development scenario (AM and PM peak hours) the R750 Sea Road arm is predicted to operate marginally over practical capacity. This is deemed to be an acceptable level of performance, given that this is some distance in the future, and would be limited to peak hours only. This is also based on the existing junction configuration.

It is also noteworthy that the introduction of the Western Distributor Road is likely to reduce traffic flows on the R772 as it passes Sea Road meaning that the future mitigation measures may not be required.

R772 Dublin Road/North Quay Roundabout

The R772 / North Quay roundabout is a three-arm roundabout. The R772 approaches are both single-lane, and the North Quay approach is a single lane plus short 15m flare.

Table 11.10 presents the modelled results for the junction.

Arm	AM Peak Hour (08:15-09:15)			PM Peak Hour (16:45-17:45)		
	Queue (pcu)	Delay (s)	RFC	Queue (pcu)	Delay (s)	RFC
Base 2024						
North Quay	0.1	3.6	7%	0.5	4.8	32%
R772 South	2.7	12.6	73%	2.0	10.6	66%
R772 North	0.8	4.4	45%	0.8	4.4	44%
Base 2027						
North Quay	0.1	3.7	8%	0.5	5.0	34%
R772 South	3.2	14.3	76%	2.3	11.7	69%
R772 North	0.9	4.6	48%	0.9	4.7	48%
Base 2027 + Development (113 units)						
North Quay	0.1	3.7	8%	0.5	5.1	35%
R772 South	3.4	14.9	77%	2.5	12.7	71%
R772 North	1.0	4.8	50%	1.0	4.8	49%
Base 2032 (+ School)						
North Quay	0.1	4.0	10%	0.6	5.4	37%
R772 South	11.2	42.3	93%	2.9	14.2	74%
R772 North	1.4	5.7	58%	1.1	5.1	52%
Base 2032 (+School) + Development (500 units)						
North Quay	0.1	4.3	11%	0.7	5.8	41%
R772 South	12.5	46.4	94%	5.3	23.3	85%
R772 North	2.1	7.4	68%	1.2	5.5	56%
Base 2042 (+ School)						
North Quay	0.1	4.1	10%	0.6	5.6	39%
R772 South	16.4	58.5	97%	3.5	16.3	78%
R772 North	1.5	6.0	60%	1.2	5.4	54%
Base 2042 (+School) + Development (750 units)						
North Quay	0.1	4.6	11%	0.8	6.4	45%
R772 South	19.7	67.8	98%	10.8	44.7	93%
R772 North	2.9	9.4	74%	1.5	6.1	60%

Table 11.10: R772 / North Quay Junctions 11 Results

Table 11.10 shows that the junction is currently operating within capacity, and this is forecast to be the case when Phase 1A of the development is added in 2027.

In the Base 2032 + School scenario (AM peak hour) the R772 south arm is predicted to operate over capacity when school traffic is added to the R772 mainline movements. Additional traffic from the Phase 1B of the development slightly increases this.

This situation is expected to worsen in 2042, when the R772 south arm is predicted to be over capacity both with the school, and then with the school and development, in place. The analysis shows that school traffic has a large impact on junction performance, with the proposed development traffic increasing this impact to a lesser extent. For example, the RFC of the R772 south arm increases from 0.77 to 0.93 when school traffic is added between 2027 and 2032, but only by a further 0.01 when Phase 1B development traffic is added on top of this.

The junction modelling suggests that mitigation measures may be required at the R772 / North Quay roundabout in 2032. The R772 south arm could be slightly widened to allow ahead and right-turning traffic to queue side-by-side. The circulating carriageway on the east side of the roundabout could be widened slightly, to allow ahead and right-turning traffic to proceed at the same time (potentially by using the over-run area on the edge of the central island as a running lane). This would provide a small amount of capacity that would be sufficient to bring the R772 south arm under capacity.

As with the Sea Road junction, it is also noted that the introduction of the Western Distributor Road is likely to reduce traffic flows on the R772 as it passes North Quay meaning that the future mitigation measures identified above may not be required.

R772 Dublin Road/Main Street/Lower Main Street Junction

The R772 / Main Street / Lower Main Street priority junction is non-standard junction configuration. Lower Main Street, which forms the eastern arm, is a one-way away street that routes away from the junction. The R772 north, and R772 Main Street (the west arm), form the major arms of the junction. Traffic turning right from the R772 onto Main Street has priority over traffic continuing straight ahead from Main Street onto Lower Main Street, which must give way.

Table 11.11 presents the modelled results for the junction.

Arm	AM Peak Hour (08:15-09:15)			PM Peak Hour (16:45-17:45)		
	Queue (pcu)	Delay (s)	RFC	Queue (pcu)	Delay (s)	RFC
Base 2024						
Main Street Lower	0.0	0.0	0%	0.0	0.0	0%
R772 Main Street	1.3	6.9	38%	1.4	8.2	42%
Base 2027						
Main Street Lower	0.0	0.0	0%	0.0	0.0	0%
R772 Main Street	1.5	7.1	41%	1.8	8.8	47%
Base 2027 + Development (113 units)						
Main Street Lower	0.0	0.0	0%	0.0	0.0	0%
R772 Main Street	1.6	7.2	42%	1.9	8.8	48%
Base 2032 (+ School)						
Main Street Lower	0.0	0.0	0%	0.0	0.0	0%
R772 Main Street	3.0	8.4	55%	2.3	9.7	53%
Base 2032 (+School) + Development (500 units)						
Main Street Lower	0.0	0.0	0%	0.0	0.0	0%
R772 Main Street	3.7	9.5	60%	3.1	10.3	58%
Base 2042 (+ School)						
Main Street Lower	0.0	0.0	0%	0.0	0.0	0%
R772 Main Street	3.6	9.3	60%	2.8	10.6	57%
Base 2042 (+School) + Development (750 units)						
Main Street Lower	0.0	0.0	0%	0.0	0.0	0%
R772 Main Street	5.5	12.4	69%	4.7	12.6	67%

Table 11.11: R772 / Lower Main Street Junctions 11 Results

Table 11.11 shows that the junction is predicted to operate under capacity in each of the modelled scenarios, and no mitigation measures will be required.

Operational Stage Junction Assessments – Conclusion

The key findings from the junction modelling exercise are:

- That the proposed signalisation of the R772 / Beech Road junction will provide sufficient capacity to accommodate the predicted traffic demand from the School Campus, and for 750 residential units on the development site;
- That the R772 / R750 Sea Road junction is expected to operate marginally over capacity in 2042, but this is deemed to be acceptable given that this is some distance in the future and would be limited to peak hours only;
- That the R772 south arm of the R772 / North Quay roundabout will likely require mitigation as a result of the School Campus, and to a lesser extent as a result from traffic from the proposed development. The R772 south arm could be slightly widened to allow ahead and right-turning traffic to queue side-by-side. The circulating carriageway on the east side of the roundabout could be widened slightly, to allow ahead and right-turning traffic to proceed at the same time (potentially by using the over-run area on the edge of the central island as a running lane); and
- The introduction of the Western Distributor Road is likely to reduce traffic flows on the R772 as it passed Sea Road and North Quay, meaning that the future mitigation measures identified may not be required.

11.8 Potential Cumulative Impacts

The principal cumulative impact present at the site is associated with the introduction of the proposed Education Campus directly adjacent to the site, which is assumed to be constructed and operational prior to the 2032 Opening Year +5 scenario. The introduction of this development is seen to have a notable impact on the Dublin Road/Beech Road junction, particularly in the AM peak period during school drop-off times.

Following completion of the proposed development, in the 2042 Opening Year +15 scenario, both developments cumulatively are seen to result in the Dublin Road/Beech Road junction operating close to its' practical capacity, with mitigation measures in place (i.e. signalisation of the junction).

This analysis does not account for any reduction in general background traffic flow on the Dublin Road passing the Beech Road junction that may arise in the future following the implementation of the planned Western Distributor Road, which in itself may result in a reduction in traffic flows through Arklow Town Centre and away from the Dublin Road – however any such transfer of traffic flows would be expected to partially increase traffic on the Beech Road itself.

Ultimately, although the supporting analysis indicates that the Dublin Road/Beech Road junction is capable of accommodating the proposed development and other committed schemes of relevance, further upgrades are likely to be required in the event of additional development occurring in the site vicinity (beyond the scope of this application) or following the implementation of the Western Distributor Road and additional vehicle crossing of the Avoca River.

11.9 Mitigation Measures

Construction Phase

Prior to commencement of construction, the appointed contractor will be required to prepare a comprehensive and detailed Construction Stage Traffic Management Plan (CTMP), to indicate how it is proposed to manage the traffic impacts during the construction stage and minimise the impact on local residents and businesses.

The CTMP will provide information on the potential location of contractor compounds, likely construction routes used for HGV's and general staff, indicative construction working hours and information regarding the potential sub-phases and associated estimated movements. The CTMP shall be submitted to Wicklow County Council for approval prior to commencement of works.

Operational Phase

To support and enable residents to travel to and from the development by sustainable modes, a supporting Outline Mobility Management Plan (OMMP) has been prepared and is included within the Traffic & Transport Assessment included within **Appendix 11** of this EIAR.

The overall aim of the MMP is to reduce the level of private car use by encouraging people to walk, cycle, use public transport or car share.

The site is well-located to support walking and cycling trips between the site and the town centre. This will improve significantly when the proposed Boardwalk link and new river crossing is constructed as part of the development. The internal road and street network includes the provision of dedicated cycle facilities and an environment that will encourage safe walking and cycling.

Furthermore, co-location of the development with the proposed Local Centre and the permitted adjacent educational campus will ensure that incidental trips for local services and trips to school for residents can be made by walking and cycling as opposed to by private car. The Local Centre also includes for the provision of

The OMMP includes a number of initial measures to be undertaken at the development, including the appointment of a Mobility Manager, and recommendations for monitoring and review post-occupation.

11.10 Predicted Impacts

Construction Phase Impact Significance and Duration

The proposed development construction phasing (scheduling of working hours) will result in a minimal increase in traffic volumes during the local network traffic peaks. It is seen in the analysis that the Dublin Road/Beech Road junction has sufficient residual capacity to accommodate the additional construction traffic flows associated with the development.

On the basis of the EPA EIAR Guidelines, the construction impact of the proposed development will be **slight to moderate** and **short-term**.

Operational Phase Impact Significance and Duration

The proposed development operational phase will result in a moderate increase in traffic volumes during the local network traffic peaks. However, the numerous measures proposed as part of the development (the proposed Local Centre, Boardwalk connection to Arklow Town and extensive high-quality walking and cycling facilities within the site) and co-location adjacent to the School Campus will mean that walking and cycling trips will be encouraged and facilitated, which will see a reduced car mode share.

It is seen in the analysis that the junctions assessed have sufficient residual capacity to accommodate the additional operational traffic flows associated with the development, with the proposed mitigation measures at the Dublin Road/Beech Road junction (implementation of signal control) seen to be capable of accommodating both the proposed development, the permitted 84-unit scheme and the adjacent School Campus development in all scenarios assessed.

On the basis of the EPA EIAR Guidelines, the operational impact of the proposed development will be **moderate** and **long-term**.

11.11 'Do Nothing' Scenario

In the 'Do Nothing' scenario, without the development proceeding, the adjacent permitted educational campus and 84-unit residential development schemes would be expected to be constructed in the coming years, along with other relevant permitted developments within the area of influence of the site. Traffic flows on the surrounding road network would also be expected to increase in line with traffic growth projections.

The proposed educational campus development would likely have a notable impact on the operation of the Beech Road/Dublin Road junction, particularly during the AM peak. The junction would therefore be likely to require improvement measures in response, potentially to include signalisation.

In the event that the proposed Western Distributor Road (WDR) and associated new crossing of the Avoca River were to be implemented, it would be likely that a transfer of vehicle trips from the wider Arklow Town area to the WDR would occur, particularly if additional demand management measures were to be implemented within Arklow Town itself. This may in turn lead to a more pronounced impact on the existing Beech Road/Dublin Road junction in response to the diverted traffic flows from Arklow Town and may potentially require additional improvements beyond the signalisation proposed as part of this assessment. The WDR scheme has not been developed sufficiently in terms of design or progression through statutory processes in order to accurately understand the wider impacts; however, the WDR remains a core element of the prevailing Arklow Local Area Plan.

11.12 Worst Case Scenario

The application of traffic growth rates to recorded survey data for future year assessment years assumes a worst case for the future year scenarios, with committed development traffic associated with the school site and the development traffic added thereafter. The analysis undertaken is therefore considered to be conservative and robust.

A 'worst-case' scenario would comprise the introduction of the development without supporting measures such as the proposed signalisation of the Beech Road/Dublin Road junction and the implementation of the pedestrian and cycle Boardwalk connection, which would result in a greater likelihood of trips from the site being made by car. In this scenario, the future mode share target of 55% trips being made by car would be difficult to achieve on site, and the resultant increase in vehicle trips, along with the absence of the mitigation measures proposed would result in the Beech Road/Dublin Road junction operating over capacity in future years, with the worst-case scenario being in the Opening Year +15 (2042), with the proposed development in place, supporting transport infrastructure improvements not implemented and the mode share for vehicle trips exceeding the stated target.

11.13 Monitoring & Reinstatement

Construction Phase

Traffic management and deliveries will be carefully monitored during the construction stage as part of the overall Construction Management Plan. The appointed contractor will also prepare and continuously monitor a Construction Stage Mobility Management Plan throughout the construction phasing.

Operational Phase

During the operational stage, the Mobility Management Plan will be monitored by the appointed site MMP Co-ordinator. Post-occupation travel surveys will establish the initial modal split of travel by residents.

The MMP Coordinator, in consultation with the Developer, the Occupiers, and the Local Authority or its agents, will agree on periodic review periods and adjusted targets, following completion and analysis of the travel survey, with the overall goal of continuing to increase the percentage of residents travelling by non-car modes.

The MMP Coordinator will:

- Meet with officers of the Local Authorities or its agents within 6 months following the occupation of the building(s) and thereafter every 12/24 months (as agreed) to assess and review the progress of the Plan and agree on objectives for the next 12/24 months, and
- Prepare and submit to senior management of the Developer, the Occupier(s) and the Local Authorities or its agents, an Annual/Biannual Monitoring Report as required.

11.14 Difficulties in Compiling Information

No difficulties were encountered in the preparation of this chapter.

11.15 References

- Environmental Protection Agency (EPA) (2022) '*Guidelines on the Information to be contained in Environmental Impact Assessment Reports*';
- Transport Infrastructure Ireland (TII) (2019) '*Project Appraisal Guidelines (PAG) Unit 5. 3: Travel Demand Projections*';
- Transport Infrastructure Ireland (TII) (2014) '*Traffic & Transport Assessment Guidelines*';
- Government of Ireland (2018) '*Project Ireland 2040 – National Planning Framework*';
- Wicklow County Council (WCC) (2022) '*Wicklow County Development Plan 2022-2028'*;
- Wicklow County Council (WCC) (2018) '*Arklow Local Area Plan 2018-2024*'.

12. Waste Management

12.1 Introduction

This section addresses the subject of waste management for a Large-Scale Residential Development (LRD) at "Lands of Kilbride", Arklow, Co. Wicklow. Waste management is addressed for the construction, and operational phases of the project.

This chapter of the EIAR has been prepared by Angela Kelly and reviewed by Nevin Traynor, of Traynor Environmental Ltd. Angela is an environmental consultant with over 10 years' experience in the commercial sector where she has undertaken extensive site surveys, watching briefs and report writing. She holds a BSc in Horticulture and PG Dip. in Environmental Science. Nevin Traynor is a Senior Environmental Consultant with Traynor Environmental; with over 25 years' experience in the environmental sector. His project experience includes the management and productions of Environmental Impact Statements (EISs)/EIARs, particularly within the Commercial/Industrial and Housing Sector.

A Resource and Waste Management Plan (RWMP) (Appendix 12.1) has been prepared for the construction phase of the development in advance of the commencement of the construction works. A separate Operational Waste & Recycling Management Plan (OWRMP) (Appendix 12.2) has also been prepared for the operational phase of the development.

The RWMP has been prepared in accordance with the 'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects' document produced by the National Construction and Demolition Waste Council (NCDWC) in conjunction with the Department of the Environment, Heritage, and Local Government in July 2006.

These documents will ensure the sustainable management of wastes arising at the development in accordance with legislative requirements and best practice standards.

Proposed Development Site Location and Brief Description

The proposed mixed use Large scale Residential Development will result in the demolition of an existing dwelling and 2 no. sheds/outbuildings and the construction of 666 no. residential units with a mix of semidetached and terraced houses along with duplex apartments and apartments. These will comprise 1, 2, 3 and 4 bed units. All residential units will have associated private open space facing north/ south/ east/ west. The proposal will also deliver a local centre containing 3 no. retail units, 3 no. community/ medical units and 1 no. creche unit.

A new pedestrian/ cyclist link is provided via a new boardwalk and bridge across the marsh and over the Avoca River adjoining the existing greenway and the Main Street. A new road providing vehicular access is also proposed connecting to the north to Kilbride Road along with road improvements in the surrounding area.

The development will also provide for landscaping, public open spaces and all associated site development works to enable the development including boundary treatments, attenuation storage area and other service provision including ESB works.

Statement of Competence

In accordance with Article 5(3)(a) of the EU Directive, by appointing Traynor Environmental, the applicant has ensured that this chapter has been prepared by "Competent experts".

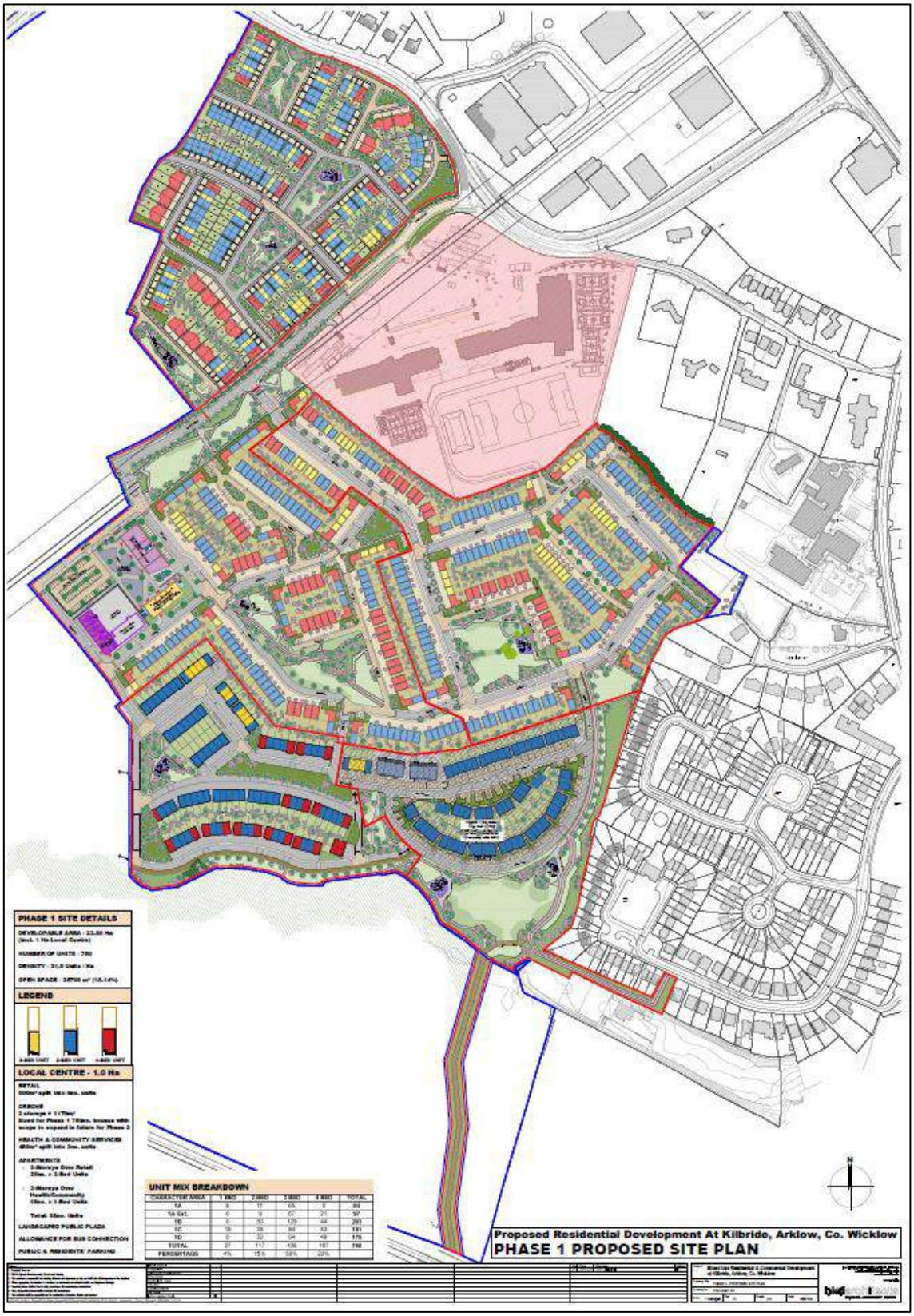


Figure 12.1:Site Layout

12.2 Methodology

The assessment of the impacts of the proposed development arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports.

The primary legislative instruments that govern waste management in Ireland and applicable to the project are:

- Waste Management Act 1996 (No. 10 of 1996) as amended. Sub-ordinate legislation includes:
    - European Communities (Waste Directive) Regulations 2011 (SI 126 of 2011) as amended
    - Waste Management (Collection Permit) Regulations (S.I No. 820 of 2007) as amended
    - Waste Management (Facility Permit and Registration) Regulations 2007, (S.I No. 821 of 2007) as amended
    - Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended
    - Waste Management (Packaging) Regulations 2014 (S.I. 282 of 2014) as amended
    - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997)
    - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015) amended by S.I. 182 of 2019.
    - European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
    - European Union (Batteries and Accumulators) Regulations 2014(S.I. No. 283 of 2014) as amended
    - Waste Management (Food Waste) Regulations 2009 (S.I. 508 of 2009), as amended
    - European Union (Household Food Waste and Bio-waste) Regulation 2015 (S.I. No. 191 of2015)
    - Waste Management (Hazardous Waste) Regulations, 1998 (S.I. No. 163 of 1998) as amended
    - Waste Management (Shipments of Waste) Regulations, 2007 (S.I. No. 419 of 2007) as amended
    - Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No. 147 of 1998)
    - European Communities (Transfrontier Shipment of Waste) Regulations 1994 (SI 121 of 1994)
    - European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015)
- Environmental Protection Act 1992 (No. 7 of 1992) as amended.
- Litter Pollution Act 1997 (No. 12 of 1997) as amended.
- Planning and Development Act 2000 (No. 30 of 2000) as amended.

This Chapter is based on the proposed development and considers the following aspects:

- Legislative context.
- Demolition phase.
- Construction phase (including site preparation, excavation, and levelling); and,
- Operational phase.

A desk study was carried out which included the following:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland.
- Description of the typical waste materials that will be generated during the demolition, construction, and operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the demolition, construction and operational phases of the proposed development have been calculated. The waste types and estimated quantities are based on published data by the EPA in *National Waste Reports*, data recorded from similar previous developments, Irish and US EPA waste generation research, other available research sources and waste collection data from the current facilities on site.

Mitigation measures are proposed to minimise the effect of the proposed development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal.

12.3 Receiving Environment

The subject site is located on the "Lands at Kilbride", Arklow, Co. Wicklow. In terms of waste management, the receiving environment is largely defined by Wicklow County Council as the local authority responsible for setting and administering waste management activities in the area. This was governed by the requirements set out in the Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021 which has been superseded by the National Waste Management Plan for the Circular Economy 2024-2030.

The NWCPCE sets the ambition of the plan to have a 0% total waste growth per person over the life of the Plan with an emphasis on non-household wastes including waste from commercial activities and the construction and demolition sector.

This plan seeks to influence sustainable consumption and prevent the generation of waste, improve the capture of materials to optimise circularity and enable compliance with policy and legislation. The national plan sets out the following strategic targets for waste management in the country that are relevant to the development:

Proposed National Targets

- 1A. (Residual Municipal Waste) 6% Reduction in Residual Municipal Waste per person by 2030
- 2A. (Contamination of Materials) 90% of Material in Compliance in the Dry Recycling Bin
- 2B. (Material Compliance Residual) 10% per annum increase in Material Compliance in the residual bin. (90% by the end of 2030)
- 3A. (Reuse of Materials) 20kg Per person / year – Reuse of materials like cloths or furniture to prevent waste.

The National Waste Statistics update published by the EPA in December 2017 identifies that Ireland's current progress against this C&D waste target is at 68% and our progress against 'Preparing for reuse and recycling of 50% by weight of household derived paper, metal, plastic & glass (includes metal and plastic estimates from household WEEE)' is at 45%. Both of these targets are required to be met by 12

December 2020 in accordance with the requirements of the Waste Framework Directive. The Wicklow County Development Plan 2022 – 2028 also sets policies and objectives for the area which reflect those set out in the regional waste management plan.

There is numerous waste permitted and licensed facilities located in the Eastern-Midlands Waste Region for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, hazardous waste treatment facilities, municipal waste landfills, material recovery facilities, waste transfer stations and two waste-to-energy facilities.

Demolition Phase

The proposed development will include demolition of 3 no. buildings to the north of the site, a dwelling, agriculture shed and outbuilding. The total Gross Internal Floor Area to be demolished for all three buildings is 711.62 m^2. The extent of demolition works consists primarily of the following

- Removal of 28.08 tonnes of masonry boundary of walls with associated 3.53 tonnes of steel railing, gates, gate piers and concrete foundations along the L-6179 in conjunction with the removal of external 63.45m^3 concrete driveways/hardstanding and grassed verges.
- Removals of 1 no. steel framed buildings (533.9m^2) with 53.40m^3 of concrete ground floors & foundations, 13.81 tonnes of non-insulated façades and rood cladding.
- Removal of 1 no. domestic dwelling and 1 no. associated garage building (172 m^2) with 76.36 of concrete ground floors & foundations, 44.91 tonnes of insulated façades and roof cladding and external glazing, 5.93 tonnes of internal load and non-load bearing masonary and lightweight partitions

Construction Phase

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The construction contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

In addition, there will be excavations associated with foundations and roads. The project engineers, Donnachadh O'Brien & Assoiates Consulting Engineers have estimated that the total volumes of material to be excavated are as follows: Cut will be 44347.11 m^3 and Fill 88861.89 m^3. It is proposed that 90 - 100% of this will be reused on site for Landscaping purposes.

In order to establish the appropriate reuse, recovery and/or disposal route for the material to be removed off-site, it will first need to be classified. Waste material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous*. Environmental soil analysis will be carried out prior to construction on a number of the soil samples in accordance with the requirements for acceptance of waste at landfills (Council Decision 2003/33/EC Waste Acceptance Criteria). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste including potential pollutant concentrations and leachability.

In the unlikely event that surplus soils/stones are generated it may be suitable for acceptance at either inert or non-hazardous soil recovery facilities/landfills in Ireland, In the event of hazardous material being encountered, it will be transported for treatment/recovery or exported abroad for disposal in suitable facilities.

Waste will be generated from construction workers e.g., organic/food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins, and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided onsite during the construction phase. Waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific RWMP.

Table 12.1 shows the breakdown of C&D waste types produced on a typical site based on data from the EPA National Waste Reports, the GMIT and other research reports.

Waste Types	%
Mixed C&D	33
Timber	28
Plasterboard	10
Metals	8
Concrete	6
Other	15
Total	**100**

Table 12.1: Waste materials generated on a typical Irish construction site.

Table 12.2 shows the predicted construction waste generation for the proposed development based on the information available to date along with the targets for management of the waste streams. The predicted waste amounts are based on an average largescale development waste generation rate per m^2, using the waste breakdown rates shown in Table 12.1 and the schedule of areas supplied by the project architects.

Waste Types	Tonnes	Reuse		Recycle/Recover		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	2579.28	10	257.93	80	2063.42	10	257.93
Timber	2188.48	40	875.39	55	1203.66	5	109.42
Plasterboard	781.60	30	234.48	60	468.96	10	78.16
Metals	625.28	5	31.48	90	562.75	5	31.46
Concrete	468.96	30	31.26	65	304.82	5	23.45
Other	1172.40	20	234.48	60	703.44	20	234.48
Total	**7816.00**		**1774.23**		**5307.06**		**734.48**

Table 12.2: Estimated on and off-site reuse, recycle and disposal rates for construction waste.

Operational Phase

An Operational Waste & Recycling Management Plan (OWRMP) has been prepared for the development. The plan will seek to ensure the development contributes to the targets outlined in the National Waste Management Plan for the Circular Economy 2024-2030.

Mitigation measures proposed to manage impacts arising from wastes generated during the operation of the proposed development are summarised below.

All waste materials will be segregated into appropriate categories and will be stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site in accordance with the Wicklow County Development Plan 2022 – 2028.

Waste Type	Apartments	Houses	Totals (L)
Organic Waste	440	2,890	3,330
Dry Mixed Recyclables	7,095	71,495	78,590
Glass	440	2,890	3,330
Mixed Non-Recyclables	7,095	71,495	78,590
Total	**15,070**	**148,770**	**163,840**

Table 12.3: Residential Waste Prediction (m3/per week)

Waste Volume (L/week)								
Non-Residential Floor Areas	**Area (Sq.m)**	**Area (sq.) GIA**	**Area (sq.) (NIA)**	**DMR Recycling**	**Food Waste**	**MNR Residual**	**Glass**	**Total (L)**
Crèche	1,095	1007.4	843.15	4215.75	10	4215.75	5	**8,446.5**
Retail	790	726.8	608.30	6083.00	5	6083.00	5	**12,176**
Community/ Medical Units	450	414.0	346.50	1732.50	5	1732.50	5	**3,475**

Table 12.4: Commercial/Creche Waste Predictions (L/per week)

12.4 Characteristics of the Proposed Development

The proposed mixed use Large scale Residential Development will result in the demolition of an existing dwelling and 2 no. sheds/outbuildings and the construction of 666 no. residential units with a mix of semidetached and terraced houses along with duplex apartments and apartments. These will comprise 1, 2, 3 and 4 bed units. All residential units will have associated private open space facing north/ south/ east/ west. The proposal will also deliver a local centre containing 3 no. retail units, 3 no. community/ medical units and 1 no. creche unit.

A new pedestrian/ cyclist link is provided via a new boardwalk and bridge across the marsh and over the Avoca River adjoining the existing greenway and the Main Street. A new road providing vehicular access is also proposed connecting to the north to Kilbride Road along with road improvements in the surrounding area.

The development will also provide for landscaping, public open spaces and all associated site development works to enable the development including boundary treatments, attenuation storage area and other service provision including ESB works.

A full development description is provided in Chapter 3 of this EIAR.

12.5 Potential Impacts

Construction Phase

This section details the potential waste impacts associated with the proposed development.

A key element of this scheme is the construction of a green infrastructure in the form of a boardwalk which crosses the marshlands to the south of the proposed development in order to increase connectivity and permeability to the centre of Arklow Town. Ground conditions of the upper soils across the marsh consist of soft silts and peaty soils. In addition the water table is liable to be seasonally variable and close to or at ground level. In order to have the least impact on the existing marshland and vegetation it is proposed that access across the marsh for construction traffic will utilise temporary timber bog mats. This proposed methodology will reduce substantially the need for excavations and temporary stockpiling, reduce stone importation and associated construction traffic, and provide a more sustainable construction methodology with a reduced embodied carbon. Specialist providers will be engaged to provide the bog mats which are 100% reusable.

The boardwalk is likely to be founded on piles. The piling solution has been designed to ensure that the lightweight rigs can be used and 150/200mm diameter bottom driven steel tube mini piles are proposed to be used. The weight of these rigs are typically between 2 and 2.5 Tonnes. As the capacity of the proposed temporary bog mat is in the order of 30T, the use of this light weight piling equipment will ensure that any potential impact from the piling activities will be minimised. The use steel end driven piled foundations will ensure that excavation of soils within the marsh area will be kept to a minimum. As the piles are end drive steel pile there are no soil arisings from the piling operation which will require disposal.

A steel framed lightweight boardwalk has been deigned to traverse the Marshland. Vertical supports will be at 6m and it is intended that the steelwork deck will be delivered in prefabricated sections and lifted in position onto the support steels. To minimise construction work in the marshland, it is proposed that precast concrete pile caps will be used onto which the steel framed boardwalk will be connected.

The proposed development will generate a range of non-hazardous and hazardous waste materials during the construction phase. General housekeeping and packaging will also generate waste materials as well as typical municipal wastes generated by construction employees including food waste.

Waste materials will be required to be temporarily stored on site pending collection by a waste contractor. Dedicated areas for waste skips and bins will need to be identified across the site. These areas will need to be easily accessible to waste collection vehicles.

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development and on adjacent developments. The knock-on effect of litter issues is the presence of vermin within the development and the surrounding areas.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices.

Wastes arising will need to be taken to suitably registered/permitted/licenced waste facilities for processing and segregation, reuse, recycling, recovery and/or disposal as appropriate. There are numerous licensed waste facilities in the Eastern Midlands region which can accept hazardous and non-hazardous waste materials. Acceptance of waste from the proposed development would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of

the likely C&D waste arising at facilities in the region. Where possible, waste will be segregated into reusable, recyclable and recoverable materials. The majority of demolition and construction materials are either recyclable or recoverable.

Recovery and recycling of C&D waste has a positive impact on sustainable resource consumption, for example where waste timber is mulched into a landscaping product or waste asphalt is recycled for use in new pavements. The use of recycled materials, where suitable, reduces the consumption of natural resources.

There is a quantity of top soil and sub soil which will need to be excavated to facilitate the proposed development. The project engineers, Waterman Moylan Consulting Engineers, have advised that it is likely that all of the excavated material from the site will be reused on site for Landscaping purposes. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

The opportunities for waste materials to be reused off-site will provide positive impacts in the resourcing of materials for other developments and reduce the requirement for raw material extraction.

The potential effect of construction waste generated from the proposed development is considered to be ***short-term,*** and ***not significant.***

Operational Phase

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy. This would lead to an increased volume of waste been disposed of site.

The nature of the development means the generation of waste materials during the operational phase is unavoidable. Networks of waste collection, treatment, recovery, and disposal infrastructure are in place in the region to manage waste efficiently from this type of development. Waste which is not suitable for recycling is typically sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables which is typically exported for conversion in recycled products (e.g., paper mills and glass recycling).

The waste materials generated on a daily basis will be stored in dedicated waste storage areas.

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development and on adjacent developments. The knock-on effect of litter issues is the presence of vermin within the development and the surrounding areas.

Waste collection vehicles will be required to service the development on a regular basis to remove waste. The use of non-permitted waste contractors or unauthorised facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously. Time and resources should be dedicated to ensuring efficient waste management practices. An Operational Waste & Recycling Management Plan has been submitted with the planning application.

The potential impact of operational waste generation from the development is considered to be ***long-term*** and ***not significant***.

12.6 Potential Cumulative Impacts

The cumulative impact of the additional wastes generated by the proposed development has been considered. The existing waste management infrastructure and procedures for management of waste are sufficient and as such there will be no significant cumulative impact in terms of waste from the proposed development.

12.7 Mitigation Measures

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

Construction Phase

A project specific RWMP has been prepared in line with the requirements of the guidance document issued by the DoEHLG. Adherence to the high-level strategy presented in this RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery, and disposal of waste material generated during the construction phase of the proposed development.

Donnachadh O'Brien Consulting Engineers have estimated that the total volumes of material to be excavated are as follows: Cut will be 44,347.11 m^3 and Fill 88,861.89 m^3 It is proposed that 90 - 100% of this will be reused on site for Landscaping purposes. Contractor(s) will endeavour to ensure material taken offsite is reused or recovered off-site or disposed of at authorised facility.

In addition, the following mitigation measures will be implemented:

- On-site segregation of all waste materials into appropriate categories including (but not limited to):
  - Organic/catering waste (including garden waste from landscaping activities).
  - Dry Mixed Recyclables.
  - Mixed Non-Recyclable Waste.
  - Glass.
- Waste electrical and electronic equipment (WEEE) including computers, printers, and other ICT equipment.
  - Batteries (non-hazardous and hazardous)
  - Fluorescent bulb tubes and other mercury containing waste (if arising).
  - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.); and
- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials.
- All waste collected from the development will be reused, recycled, or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available.
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted, or licensed facilities;

These mitigation measures will ensure that the waste arising from the construction phase of the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter Pollution Act 1997* and the *EMR Waste Management Plan*

(2015 - 2021). It will also ensure optimum levels of waste reduction, reuse, recycling, and recovery are achieved and will encourage sustainable consumption of resources.

Operational Phase

All waste materials will be segregated into appropriate categories and will be stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site in accordance with the *Wicklow County Council Development Plan 2022 – 2028*.

In addition, the following mitigation measures will be implemented:

- On-site segregation of all waste materials into appropriate categories including (but not limited to):
    - Organic/catering waste (including garden waste from landscaping activities).
    - Dry Mixed Recyclables.
    - Mixed Non-Recyclable Waste.
    - Glass.
    - Waste electrical and electronic equipment (WEEE) including computers, printers, and other ICT equipment.
    - Batteries (non-hazardous and hazardous)
    - Fluorescent bulb tubes and other mercury containing waste (if arising).
    - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.); and
- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials.
- All waste collected from the development will be reused, recycled, or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available.
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted, or licensed facilities; and

These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, and all associated Regulations. It will also ensure optimum levels of waste reduction, reuse, recycling, and recovery are achieved.

12.8 Predicted Impacts

The implementation of the mitigation measures outlined in Section 12.7 will ensure that a high rate of reuse, recovery and recycling is achieved at the development during the construction phases as well as during the operational phase. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

Construction Phase

A carefully planned approach to waste management as set out in Section 12.7 and adherence to the RWMP during the construction phase will ensure that the impact on the environment will be *short-term, neutral,* and *imperceptible.*

Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 12.7 will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented, and a high rate of reuse, recycling and recovery is achieved, the predicted impact of the operational phase on the environment will be *long-term, neutral,* and *imperceptible*.

12.9 'Do Nothing' Scenario

If the proposed development did not go ahead there would be no waste generated at this site and operational waste generated from this site would stay at its current level.

12.10 Worst Case Scenario

- The 'worst-case' scenario, is that, should a RWMP not be implemented, the target recycling rates outlined in for County Wicklow On-site segregation of all waste materials into appropriate categories including (but not limited to):
  - Organic/catering waste (including garden waste from landscaping activities).
  - Dry Mixed Recyclables.
  - Mixed Non-Recyclable Waste.
  - Glass.
  -Waste electrical and electronic equipment (WEEE) including computers, printers, and other ICT equipment.
  - Batteries (non-hazardous and hazardous)
  - Fluorescent bulb tubes and other mercury containing waste (if arising).
  - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.); and
- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials.
- All waste collected from the development will be reused, recycled, or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available.
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted, or licensed facilities;

and all relevant waste guidance targets will not be achieved. In addition, if waste is not managed and stored correctly on site, this may lead to litter or pollution issues on the site or adjacent sites. However, this is thought to be unlikely having taken into consideration the mitigation measures outlined above.

12.11 Monitoring & Reinstatement

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the construction phases where there is a potential for waste management to become secondary to progress and meeting construction schedule targets. The RWMP will specify the need for a waste manager to be appointed who will have responsibility to monitor the actual waste volumes being generated and to ensure that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the waste manager should identify the reasons for targets not being achieved and work to resolve any

issues. Recording of waste generation during the project will enable better management of waste contractor requirements and identify trends. The data should be maintained to advise on future projects.

Operational Phase

During the operational phase, waste generation volumes should be monitored against the predicted waste volumes outlined in the OWRMP. There may be opportunities to reduce the number of bins required in the communal Waste Storage Areas (WSAs) where estimates have been too conservative. Reductions in bin requirements will improve efficiency and reduce waste contractor costs. Waste legislation should also be consulted on a regular basis in case of any changes which may impact on waste management procedures.

Asbestos

A Refurbishment/Demolition Asbestos Survey shall be carried out prior to the commencement of the demolition works, which is limited to some agricultural buildings to the north of the site. The buildings will be surveyed for the purpose of detecting and recording incidences of asbestos containing materials (ACMs). A report shall then be prepared which will contain a register showing the location and type of asbestos and the risks and recommendations in relation to the material identified. ACMs identified by the Asbestos survey will be required to be removed by a suitably trained and competent persons and removed from site by a suitably permitted Waste haulier where it shall be transported to a suitably licenced facility. The Contractor shall handle ACMs in accordance with the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006, as amended and associated approved Codes of Practice. The Contractor shall be responsible for preparing specified Risk Assessment and Method Statements for the identification and removal of all ACMs on site, if appropriate to the works.

Invasive Species

An Ecological Site survey was carried out by Altemar Limited as part of the site ecological assessment for which this application relates, to assess, identify and manage any invasive species, such as Japanese Knotweed. No invasive species were recorded within the site, as defined by Schedule 3 of SI 355/2015, and no site-specific measures are deemed necessary to address the presence of invasive species.

12.12 Difficulties in Compiling Information

There were no difficulties encountered during the production of this chapter of the EIAR.

12.13 References

- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, May 2022).
- Draft Advice Notes for preparing Environmental Impact Statements (EPA, September 2015).
- Guidelines on Information to be contained in Environmental Impact Statements (EPA, 2002).
- Advice Notes on Current Practice in the preparation of Environmental Impact Statements (EPA, 2003).
- EPA National Waste (Database) Reports.

- The Wicklow County Development Plan 2022-2028.
- Waste Management Act 1996 (No. 10 of 1996), as amended.
- Eastern-Midlands Waste Region Waste Management Plan, 2015-2021, Eastern-Midlands Region, 2015.
- The Wicklow County Council Waste Management (Segregation, Storage and Presentation of Household and Commercial Waste) Bye-Laws 2018.
- Waste Framework Directive (Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste).
- Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended
- Waste Management (Facility Permit and Registration) Regulations 2007, as amended
- Waste Management: Changing Our Ways, The Department of the Environment and Local Government, 1998.
- Preventing and Recycling Waste: Delivering Change, The Department of the Environment and Local Government, 2002.
- Taking Stock & Moving Forward, The Department of the Environment and Local Government, 2004.
- National Strategy on Biodegradable Waste Management, Department Environment, Heritage, and Local Government, 2006.
- A Resource Opportunity – Waste Management Policy in Ireland, Department of the Environment, Community and Local Government, 2012.
- Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous, Environmental Protection Agency, 2015.
- Waste Management in Buildings – Code of Practice, British Standard, BS 5906:2005, 2005.
- Mobile Waste and Recycling Containers Part 1: Containers with 2 wheels with a capacity up to
- 400 l for comb lifting devices — Dimensions and design, British Standard, BS EN 840-1:2012, 2012.
- Mobile waste containers. Containers with four wheels with a capacity from 750 l to 1700 l with flat lid(s), for wide trunnion or BG-and/or wide comb lifting devices. Dimensions and design, British Standard, BS EN 840-4:1997, 1997.
- Municipal Waste Statistics for Ireland, EPA Waste Data Release, 31 October 2018

13. Cultural Heritage

13.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) has been prepared by Shanarc Archaeology Ltd. It describes the baseline archaeology, architectural and cultural heritage environment in relation to Phase 1 development at the Kilbride lands, it identifies the likely significant effects of the proposed development on the archaeological and cultural heritage resource, and it proposes measures to mitigate predicted effects.

The term 'cultural heritage' is broadly used to describe any combination of tangible archaeological, architectural and cultural heritage material remains or assets, as well as intangible associations of people with place and values; in general:

- Archaeological heritage comprises movable objects, monuments, buildings, landscapes or environmental evidence that generally pre-date AD1700, present both above and below ground level;
- Architectural heritage, also referred to as built heritage, comprises structures, buildings, their settings and contents that generally post-date AD1700; and
- Cultural heritage relates to less tangible aspects of heritage and the landscape such as historical events, folklore, traditions, placenames and cultural associations.

Date is not in itself a determinant of cultural heritage significance or interest, and any material remains that can contribute to understanding past societies, whether pre-dating or post-dating AD1700, may have archaeological, architectural or cultural heritage significance (Department of Arts, Heritage, Gaeltacht and the Islands 1999, 10).

13.2 Methodology

Alongside the legislation, policy, and guidance outlined in Chapter 1 of the EIAR, the following relevant legislation, policy, and guidance has informed the preparation of this Chapter:

Ireland has ratified and/or is guided by several international and European conventions, charters and directives on the protection of cultural heritage, principally:

- International Charter for the Conservation and Restoration of Monuments and Sites (Venice Charter) 1964;
- UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage (The World Heritage Convention) 1972;
- European Convention for the Protection of the Architectural Heritage of Europe (Granada Convention) 1985; and
- European Convention on the Protection of the Archaeological Heritage (Valetta Convention) 1992.

National legislation protecting archaeology and cultural heritage comprises:

- National Monuments Act 1930 (as amended);
- Heritage Act 1995;

- National Cultural Institutions Act 1997;
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999;
- Planning and Development Act 2000 (as amended); and
- Historic and Archaeological Heritage and Miscellaneous Act 2023 (enacted and partially commenced at date of writing, March 2025).

Principal policy and guidance documents relating to archaeology and cultural heritage are:

- Frameworks and Principles for the Protection of the Archaeological Heritage (1999), Department of Arts, Heritage, Gaeltacht & the Islands;
- Policy and Guidelines on Archaeological Excavation (1999), Department of Arts, Heritage, Gaeltacht & the Islands;
- Archaeology & Development: Guidelines for Good Practice for Developers (2000), The Heritage Council;
- Architectural Heritage Protection Guidelines for Planning Authorities (2011), Department of Arts, Heritage, Gaeltacht & the Islands; and
- Guidelines for Cultural Heritage Impact Assessment of TII National Road and Greenway Projects (2024), Transport Infrastructure Ireland.

The preparation of this chapter has also been informed by a desk-based study of relevant data sources including:

National Monuments

Under the National Monuments Act 1930 (as amended), archaeological sites in the ownership or guardianship of the State or a Local Authority and sites under Preservation Orders are designated as National Monuments. Such sites are offered the highest level of protection under Irish legislation. Lists of National Monuments in State care are managed by the National Monuments Service of the Department of Housing, Local Government and Heritage and those in the ownership of individual Local Authorities are managed by the relevant Local Authority. The list of National Monuments in State Care (Ownership and Guardianship) for County Wicklow is made available on the National Monuments Service website, archaeology.ie, and in the Wicklow County Development Plan 2022-2028, Chapter 8, Built Heritage.

Sites and Monuments Record and Record of Monuments and Places

The Record of Monuments and Places (RMP) was established under Section 12 of the 1994 National Monuments (Amendment) Act. The statutory RMP is a list of archaeological monuments known to the National Monuments Service, and records known upstanding monuments, their original location (in cases of destroyed monuments) and the position of possible sites identified as cropmarks on aerial photographs. The RMP is based on the Sites and Monuments Record (SMR) files housed at the National Monuments Service, with new sites identified being added to the SMR and then scheduled for inclusion in the statutory RMP. All sites recorded on the RMP receive statutory protection under the National Monuments (Amendment) Act 1994. Records of monuments are available in an on-line digital service (the Historic Environment Viewer, maps.archaeology.ie) provided by the Department of Housing, Local Government and Heritage.

Urban Archaeological Survey

The Urban Archaeology Survey, 1982-1995, was established to record archaeological monuments and information relating to Irish towns, in particular former medieval boroughs that developed into modern urban settings. One of the main objectives was to highlight the archaeological potential of Irish towns and the Survey produced maps and plans highlighting monuments and zones of archaeological potential (based on the available evidence) that could be used for planning purposes, as well as by archaeologists and other researchers. The Urban Archaeological Survey of County Wicklow (1989), including Arklow town, was commissioned by the Office of Public Works (OPW) and compiled by John Bradley and Heather A. King.

Topographical Files of the National Museum of Ireland

The topographical files of the National Museum of Ireland (NMI) are the national archive of all known antiquities recorded by the NMI, and are available for consultation at the NMI. These files relate primarily to artefacts but also include references to monuments and contain a unique archive of records of previous excavations. The find-spots of artefacts can be an important indication of the archaeological potential of an area. Any archaeological object found without a known owner at the time it was found is protected under National Monument's legislation and is deemed to be in the ownership of the State. The topographical files were consulted on 31 October 2024.

Excavations Bulletin and Excavations Database

The Excavations Bulletin and the Excavations Database (excavations.ie) provides summary accounts of archaeological investigations and excavations carried out in Ireland – north and south – from 1969. The Excavations Bulletin is a published annual directory for the years 1970-2010, substituted with an on-line database from 2011 onwards. The on-line database is updated on a constant basis. A review of the database identified previous investigations completed in relation to the construction of the M11 Arklow Bypass, relating to the Arklow Flood Relief Scheme, and relating to pre-existing geophysical survey and test-excavation undertaken to date at the Kilbride lands, associated with pre-development archaeological mitigation.

Wicklow County Development Plan 2022-2028

Each City and County Development Plan is compiled in accordance with the requirements of the Planning and Development Act 2000 (as amended) and contains lists of national monuments (both in State Ownership or Guardianship, and those vested in the care of a Local Authority), recorded monuments, registered historic monuments as well as monuments that are subject to a Preservation Order. The Wicklow County Development Plan 2022 – 2028 came into effect on 23rd October 2022 and sets out the Local Authorities' strategy, policies and objectives to protect, conserve and manage the archaeological and cultural heritage resource. Built Heritage, comprising archaeology, architecture and cultural heritage is addressed in Chapter 8 of the Plan. Built Heritage Objectives are laid out in Section 8.5. The Record of Protected Structures is provided in Appendix 4. The Arklow and Environs Local Area Plan 2018 – 2024 was also read in conjunction with the Wicklow County Development Plan.

Built and Natural Heritage is addressed in Chapter 10 of the Local Area Plan. Heritage Objective HT3 (pg. 51) aims to "*protect and enhance the character, setting and environmental quality of natural, architectural and archaeological heritage, and in particular those features of the natural landscape and built structures that contribute to its special interest. The natural, architectural and archaeological heritage of the area shall be protected in accordance with the objectives set out in the Wicklow County Development Plan.*"

National Inventory of Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) is an ongoing survey within the Department of Housing, Local Government and Heritage. The work of the NIAH involves identifying and recording the architectural heritage of Ireland, from AD1700 to the present day and includes country houses, churches, mills, bridges and other structures of note. The NIAH survey of Wicklow is the largest survey of the post-1700 built heritage of the county. Structures rated as being of regional or above importance are included in the Minister's recommendations to the planning authorities for inclusion on the list of Record of Protected Structures.

Cartographic Sources

Information gathered from historic cartographic sources is fundamental to the identification of archaeological and cultural heritage sites, including cultural landscapes e.g. demesne landscapes, which, based on the level of landscape change, are now often identified from cartographic records alone. The earliest Ordnance Survey maps date to the late 1830s and early 1840s, but much change has occurred in the use and treatment of the landscape in the intervening years, particularly during the second half of the 20th century and into the 21st century, making these a valuable resource in tracing the development of a study area.

Aerial Photographs

Aerial photographs are a useful aid in identifying archaeological monuments which are not visible at ground level, and in accessing landscape change and use post-dating historic cartographic sources. Cropmarks of sub-surface archaeological features are revealed from the air by variations in plant growth. The successful detection of cropmarks through aerial photography varies, and is subject to a number of factors, including the position of the sun when the photograph was taken, the type of crop growing and the amount of rainfall in a growing season.

LiDAR Imagery

LiDAR is a scanning system that uses laser light emitted from equipment on low flying aircraft. The reflected light allows measurements to be taken of the earth's surface from which topographical maps are created. This data is available through Open Topographic Data Viewer hosted by the Geological Survey of Ireland (dcenr.maps.arcgis.com). The Kilbride lands are covered by LiDAR hillshade generated by Office of Public Works (OPW) & National Aerial Survey Contract (NASC) 2m data from 2011.

Toponomy Sources

A townland name may preserve information relating to its archaeology, history, folklore, ownership, topography or land use. Most placenames were anglicised by the Ordnance Survey. Despite some inaccuracies in translation, the Gaelic, Viking, Anglo-Norman and English origins of placenames are generally recognisable. The Placenames Database of Ireland website (wwww.logainm.ie) hosts online bi-lingual placename research and archival records for townlands.

Documentary Sources

Documentary sources are a valuable means of completing the written archaeological and cultural heritage record of an area, and of gaining insight into the history of the receiving environment. Sources

included existing unpublished archaeological assessment and investigation reports available through the Archive Unit of the National Monuments Service.

On-site Inspection

On-site inspection offers the opportunity to examine a study area in light of desk-based research and evidence. Inspection is essential in determining the nature and extent of any surviving above-ground evidence, and in predicting the potential effects of a proposal on potential below-ground remains. A site inspection at the Kilbride lands was conducted by Shanarc Archaeology Ltd. on 13 November 2024.

13.3 Receiving Environment

Site Description

The Phase 1 Kilbride lands are located in Kilbride townland, Kilbride Civil Parish, and Barony of Arklow, in Co. Wicklow. Related development proposals also incorporate part of Tiknock townland to the east, and Marsh townland to the south, the majority of the latter townland corresponding with Arklow Town Marsh.

The lands are to the north of the Avoca River, bordering the Town Marsh, and are accessible from the Kilbride Road L-6179 on the northern boundary, opposite the Arklow Business Enterprise Centre and Kilbride Industrial Estate. To the east, the lands are bordered by existing housing at Avondale Crescent / Murell Drive and St. Joseph's School. The M11 Arklow Bypass lies to the west, bordering a larger land area at the Kilbride lands forming part of an Action Area Plan (AAP3) identified in the Arklow and Environs Local Area Plan 2018-2024 that will also be subject to development. Utilised as tillage land, the topography generally follows a sloping trend from higher ground at the north and north-west, falling in a south and southeast direction towards the Town Marsh and the Avoca River. Views are extensive in this direction, across Arklow town and to the coastline.

The historic town at Arklow developed on the south side of the Avoca River. On the north bank, a medieval Cistercian Abbey was founded on low-lying marsh, forming part of the medieval town, immediately north of the bridge crossing on the Avoca. The marsh was also crossed by a causeway extending west from Ferrybank Road, from the site of the former Cistercian Abbey, to Shelton Abbey house and demesne, the ancestral seat of the Howards, Viscounts and Earls of Wicklow.

The Howard family mausoleum, known as 'The Pyramid', is one of two Howard mausoleums within Kilbride Graveyard. The graveyard is in the ownership of Wicklow County Council, and was the subject of a Conservation Plan (Whitty and Rees 2021), completed as an action of the County Wicklow Heritage Plan. The graveyard is located on higher ground accessed from the Kilbride Road L-6179, within 160m of the Phase 1 Kilbride lands. It borders the Area Action Plan (AAP3) for Arklow and further planned phased development at Kilbride.

Archaeological and Historical Background

The known archaeological record in the wider Arklow area dates from at least the Neolithic (c. 4000-2400BC), with the construction of the M11 Arklow Bypass establishing continued settlement into the Bronze Age (c. 2400-500BC). In Kilbride townland, the construction of the M11 uncovered the remains of a habitation site (WI040-048----), consisting of post-holes representing an oval structure, a burnt spread (WI040-051----) and a burnt mound (WI040-052----, all of Bronze Age origin. A furnace also excavated on the M11 alignment at Kilbride (WI040-050----), containing evidence of waste iron, may be slightly later in origin. Numerous other prehistoric remains were excavated on the M11 in adjacent Coolboy townland, and in Templerainy townland, comprising further burnt mounds or pits, and

cremation or burial pits. Prehistoric remains excavated on the M11 range in terms of distance, from 390m to the west, and up to 1.6km to the north of the Kilbride lands.

Arklow emerges as an area of significance during the early medieval period (AD 400-1100). The latter part of this period is characterised by Viking activity, especially along the eastern coast of Ireland, and by AD 830, the Vikings began to establish coastal bases. Arklow is understood to have been one of these, and it is one of a small handful of Irish places whose name is genuinely of Scandinavian origin (Bradley & King 1989). The precise meaning of the name remains open to debate, and one suggestion is Arkell-lo, "Arkell's meadow"; another is Ar-lo, "river meadow" (Grogan 1997). The Irish name for Arklow town is *An tInbhear Mór*, meaning 'the great estuary". The Vikings would have conducted coastal raids from the camp, as well as travelling inland via the Avoca River. Whilst no archaeological evidence has been discovered to date that confirms the nature of the Viking settlement, the placename, combined with a burial discovered during the 19th century between the Three Mile Water and Arklow town, of presumed Scandinavian origin, indicates that a Viking settlement did exist (Bradley & King 1989). The burial was accompanied by two bronze oval brooches and a silver wire chain, with attached silver needle case (Coffey 1902, 71-3). The exact location of the burial is unknown, but the artefacts have been dated to the 10th or early 11th centuries. The available evidence suggests that the Viking settlement would have been to the south side of the Avoca River, directly south of Kilbride townland (Whitty and Rees 2021).

Arklow's beginnings as a town commenced with the Anglo-Normans (Bradley & King 1989). The first of the Irish Anglo-Norman landings and invasions took place in County Wexford, at the invitation of the former king of Leinster, Dermot MacMurrough Kavanagh, in AD 1169 and 1170. The Norman feudal culture, techniques, language and legal systems were to have a profound effect on the country. In 1185, the manor of Arklow was granted to Theobald FitzWalter, predecessor of the Butler dynasty[1], who founded a Cistercian Abbey on the "island of Arklow" (Gwynn and Hadcock 1970), on the north side of the Avoca River (WI040-029004-), at Ferrybank. In 1927, a number of burials were discovered at this location, which is marked on the first edition 6-inch Ordnance Survey map, published in 1840, as 'Site of Grave Yard' (WI040-029008-), and which is now covered by houses. The records also suggest that a probable earth and timber castle had been constructed at Arklow prior to the land grant to Theobald FitzWalter, its location now marked by an Anglo-Norman masonry castle (WI040-029002-) at the north-western end of the historic town (WI040-029---) (Curtis 1932). In 1264, Thomas, son of Theobald, granted land to the Dominicans and they established a religious house on the south side of Arklow town (WI040-029001-). Portions of the church and cloistral buildings survived into the mid-18th century. The 'church of Arklow' is mentioned in 1279, referring to the medieval parish church of St. Mary (WI040-029003-), which was located on the north side of the main street. No upstanding remains survive, the site being marked by a public park, which has 18th and 19th century tombstones around its perimeter. A graveyard (WI040-029007-) is recorded at this site on the first edition 6-inch Ordnance Survey map, published in 1840, as 'Grave Yard' and on the 25-inch Ordnance Survey map, published in 1909, as 'Grave Yd. (*Disused*).' The street pattern in the town, as well as the linear burgage plot boundaries that run perpendicular to the Main Street, including on the north side extending to the Avoca River, will be of 13th century origin.

The townland name of Kilbride derives from the Irish *Cill Bhríde* meaning the church of Bridget. By implication, it may be suggested that the former church (WI040-021001-), which is labelled as Kilbride Church on the historic maps, was dedicated to Saint Bridget, with nearby Kilbride House and the townland of Kilbride subsequently deriving their names from the presence of the church. The dedication to Saint Bridget suggests a pre-Norman date for the foundation, with the surviving church remains possibly dating to the period between the 10th and mid-12th century (Whitty and Rees 2021). There is certainly reference to the church in documentary sources from the 12th century, up to the

[1] Whose main residence by the 14th century was at Kilkenny, and the castle at Arklow was only a minor property.

17th century (*ibid*). The use of the graveyard by the Howards, Earls of Wicklow, whose seat was at nearby Shelton, dates to the late 17th century, when Dorothea Howard (later Hasells) was interred in 1684 within the church. The church was situated to the south-west side of the Howard mausoleum (erected in the late 18th century) and was described in a ruinous state by the 17th century (in 1630), prior to Dorothea Howard's burial. The church land at Kilbride was part of a vast estate owned by the abbot of Glendalough in the 12th century, which was subsumed into the Diocese of Dublin in 1216, the church becoming the property of the archbishop of Dublin (*ibid*). A collection of papers, titled the *Wicklow Papers*, papers of the Earl's of Wicklow, held at the National Library of Ireland, include leases of presumably church land at Kilbride from Narcissus Marsh, Archbishop of Dublin to Dr. Ralph Howard (1638-1710), dated 29 September 1701.

The Ordnance Survey letters, compiled in 1839 during the progress of the Ordnance Survey describes Kilbride parish, recording that the name in Irish is '*Cill Brigde'*. The letters mention 'the old church yard in Kilbride' in which is 'still seen the gable of an old church and a portion of a side wall attached to it.' The letters goes on to describe two monuments within the churchyard, a monument erected by Ralph Viscount Wicklow in 1785 in memory of the Howard family, and an unconnected vault to the memory of Frances Parnell. The latter mausoleum is also a Howard family mausoleum, constructed by the Hon. Hugh Howard, brother of the first Viscount, whose family seat was at Castle Howard. Both are wholly separate mausoleums. By the early 19th century, the Viscount mausoleum was already termed 'the monument', and the road leading to it from Ferrybank was referred to a 'monument lane' (Power 2002). A churchyard in nearby Templerainy (WI040-017----) is also mentioned in the Ordnance Survey letters, as is a 'burying place' on 'Whisun Hill' (or Whitson Hill) in the grounds at nearby Shelton Abbey (WI040-020001-), presumably also the site of a church (WI040-020----). The exposure of several graves at the former Cistercian Abbey site north of the river bridge in Ferrybank was also recorded during the course of the Ordnance Survey, which also records that a green mount to the west of the graveyard and Cistercian Abbey site that was dug for manuring land contained urns and burnt human remains. This is a possible reference to a possible former prehistoric burial mound situated near the north bank of the Avoca River.

Shelton, now Shelton Abbey, predates 1655, having a possible medieval forerunner, and was owned by Robert Hasells, first owner of Shelton, who married Dorothea Howard in 1655, at which time she and her only son, Ralph, moved to Shelton (Whitty and Rees 2021). Ralph Howard succeeded Robert Hasells to the Shelton estate. A descendant, also named Ralph (1726-1789), first elected MP for Wicklow in 1761, was elevated to the title Viscount Wicklow in 1785 (*ibid*), building the Howard family mausoleum at Kilbride graveyard to reflect this elevated status. The house known as Shelton Abbey was also built in this period, in 1770, and later remodelled in the early 19th century. The family also acquired the peerage of Earls of Wicklow from 1793. The demesne grounds at Shelton Abbey border Kilbride townland to the west. The Wicklow Papers, papers of the Earl's of Wicklow held at the National Library of Ireland, make clear that Kilbride formed part of the Howard landholdings, making numerous references to leasing of lands at Kilbride.

Amongst those listed is a lease of 1791, of lands at Kilbride from Robert, Lord Viscount Wicklow to Francis Sherwood and Elizabeth Sherwood. The Primary Valuation, which was overseen by Richard Griffith and published between 1847 and 1866, was the first full scale valuation of property in Ireland. At the time of the Valuation, Kilbride House, which was sited at short distance to the south Kilbride Church and Graveyard in Kilbride townland, was leased by a Margaret Sherwood from the Earl of Wicklow. The property was described as house, offices and land. The connection of the Sherwood name with Kilbride House in the late 18th century suggests the house may have an 18th century origin. The church and graveyard formed part of the lands surrounding Kilbride House, but was held directly by the Howards. A small house on these lands, to the southeast corner of Kilbride townland, appears to have been leased by Margaret Sherwood to a John Byrne. Robert Nicholson also leased a house,

offices and land from the Howards fronting onto Kilbride Road, bordering Woodmount House, also on Howard property and leased to Michael Hudson.

Historic Cartographic Analysis

The analysis of successive historic maps shows how landscape has evolved over time, and in comparing maps evidence for the presence, alteration or removal of cultural heritage can be traced.

Down Survey Maps (1656-1658)

The Down Survey is a mapped survey carried out between 1656 - 1658 under the direction of Sir William Petty that recorded land confiscated from Irish Catholics to facilitate Cromwellian settlement. The maps were produced at county, barony and parish level, recording townland boundaries, their areas and proprietors, along with detail on roads, rivers, towns, churches, castles, houses and fortifications, as well as topographic and landuse detail. Arklow is named on the County map for Wicklow, with detail on the town provided on the Barony map of Arklow (Figure 13.1). The map records Arklow town in the Shires of Arklow, and important elements such as 'Arklow Castle,' the 'Abby' (representing a Dominican Friary) and associated 'Abbyland,' along with other significant structures or houses donating the town. As the county and barony maps (no parish level map available) are blank and record no additional detail around the town, including the Avoca River and the area containing the Kilbride lands to its north, suggests the area was already in Protestant ownership, and wasn't mapped for land redistribution.

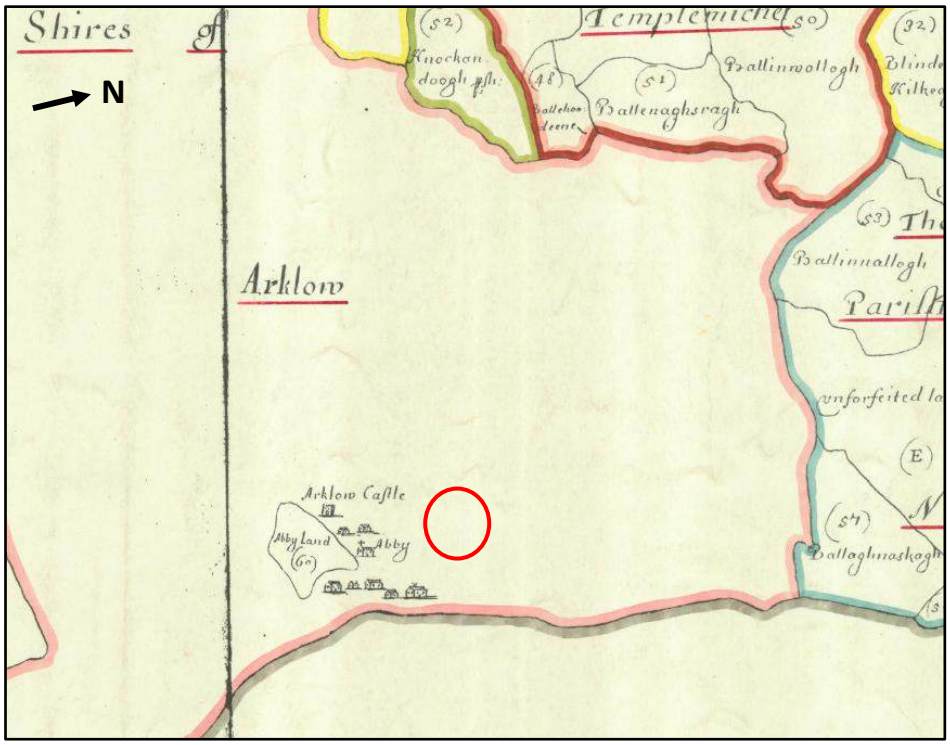


Figure 13.1: Extract from the Down Survey Barony of Arklow map, 1656-58, with approximate location of Kilbride lands highlighted (in red) (https://downsurvey.tchpc.tcd.ie).

Taylor & Skinner Maps of the Roads of Ireland (1777)

George Taylor and Andrew Skinner undertook their survey of the Roads of Ireland, commissioned by the House of Commons (Ireland), in 1777, and produced a volume of these maps, depicting towns and villages, country seats and other structures en route in 1778. Taylor and Skinner's Map 141 of the route from Dublin to Wexford (Figure 13.2) records a recognisable road network at Arklow town, and heading north and north-westwards from the town. No detail on the Kilbride lands is recorded, other that the northern end being wooded. The seat at 'Shelton,' to the west of the Kilbride lands, is depicted, when Ralph Howard was then Baron Clonmore.

Figure 13.2: Extract from Taylor and Skinner's Map 141 of the road from Dublin to Wexford, with approximate location of Kilbride lands highlighted (in red) (https://www.swilson.info).

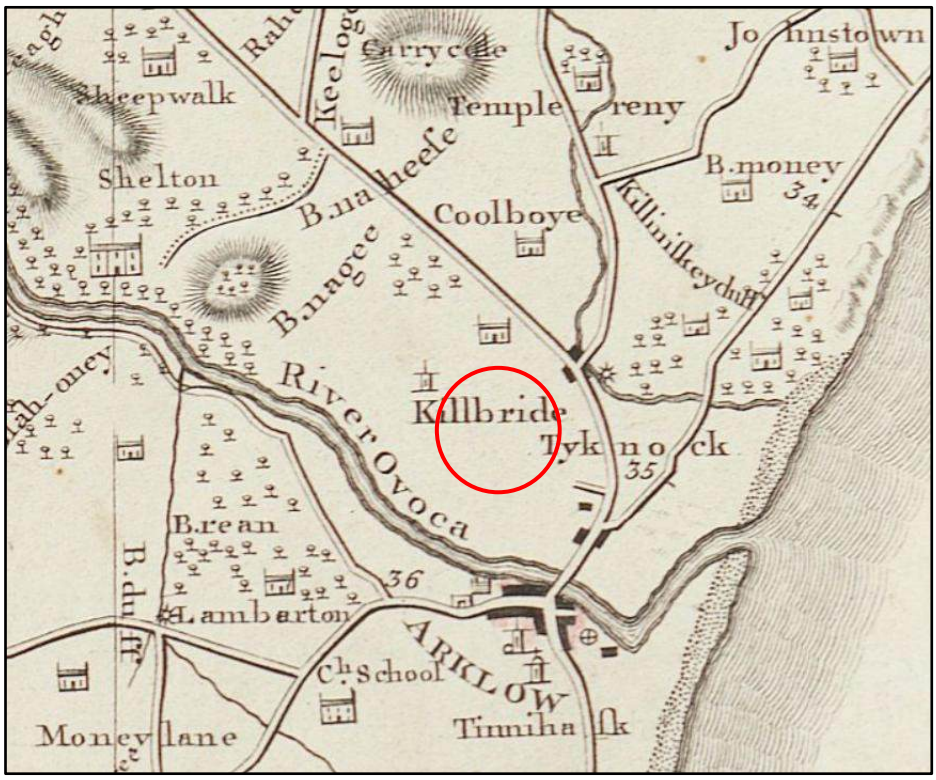


Figure 13.3: Extract from a map of the county of Wicklow by Arthur Nevill, c. 1800, with approximate location of Kilbride lands highlighted (in red) (digitalcollections.tcd.ie).

Map of the County of Wicklow (*c.* 1800)

Created by Arthur Neville, this map records a placename, now obsolete, annotated 'B nagee,' for Ballynagee, situated between 'Killbride' church, depicted pictorially, and the house known as 'Shelton' (Figure 13.3). A house shown a short distance to the northeast of the church is unnamed, but likely to represent Woodmount House, as named on later maps. There is no evidence that Kilbride House, to the south of the church, existed at this time.

Ordnance Survey Maps and Primary Valuations Map (19th and 20th centuries)

The first ever large-scale survey of Ireland was undertaken by the Ordnance Survey between 1829 and 1842, producing highly accurate maps at different scales. The first edition Ordnance Survey 6-inch map (Sheet WW040), surveyed in 1837 and published in 1840 (Figure 13.4), shows the Kilbride lands in detail for the first time, showing the lands as enclosed, comprising many medium sized agricultural fields, with an associated farmstead situated on the alignment of the Kilbride Road L-6179. The Primary Valuation (1847-1864) records the farmstead as being occupied by Robert Nicholson. The Kilbride Road at this time appears to have provided for local access, passing through the Nicholson farmyard, and continuing onto Kilbride Church and Graveyard, and to Kilbride House, occupied by Margaret Sherwood (Figure 13.5). The latter house is recorded cartographically for the first time, establishing that it is at least of early 19th century date, although the connection of the Sherwood family in Kilbride in the later 18th century indicates the house may have origins in the 18th century. Samuel Lewis, in his *A Topographical Dictionary of Ireland* (1837) does not mention Kilbride House amongst several good residences in Kilbride Parish. Possible quarrying, or borrow pits, are represented by shaded areas on the map. A narrow lane, accessed from the south side of the Kilbride Road L-6179, to the east side of the Phase 1 Kilbride lands, accesses a small house close to the townland boundary with Marsh; this was a house held from Margaret Sherwood of Kilbride House in the mid-19th century.

Marsh townland is shown with a road or causeway align SE-NW from the main public road in Ferrybank to the demesne at Shelton Abbey.

The Ordnance Survey 25-inch map (Sheets WW040-12 and WW040-16), surveyed in 1907 and published in 1909, records the disappearance, in full, of the Nicholson farmstead on the Kilbride Road L-6179 (Figure 13.6). A rectangular yard and a small building shown on the map do not appear to relate to the early farmyard arrangement. This may have been an outcome of work on the Kilbride Road L-6179, which now passes by way of Kilbride Church and Graveyard and continues into the demesne at Shelton Abbey, linking with the road network in the demesne. The access lane to Kilbride House, whose footprint has been modified from its mid-19th century layout, now branches from the extended Kilbride Road. Otherwise, modified field enclosures are evident on the map, as well as drainage management across Marsh townland. An embankment appears to mark the boundary between drained land and the tidal reach of the Avoca River in Marsh townland.

The revised 6-inch Ordnance Survey map (Sheet WW040) was published in 1910 (Figure 13.7). As the map dates from the same period as the 25-inch map, no additional information on the Kilbride lands is recorded.

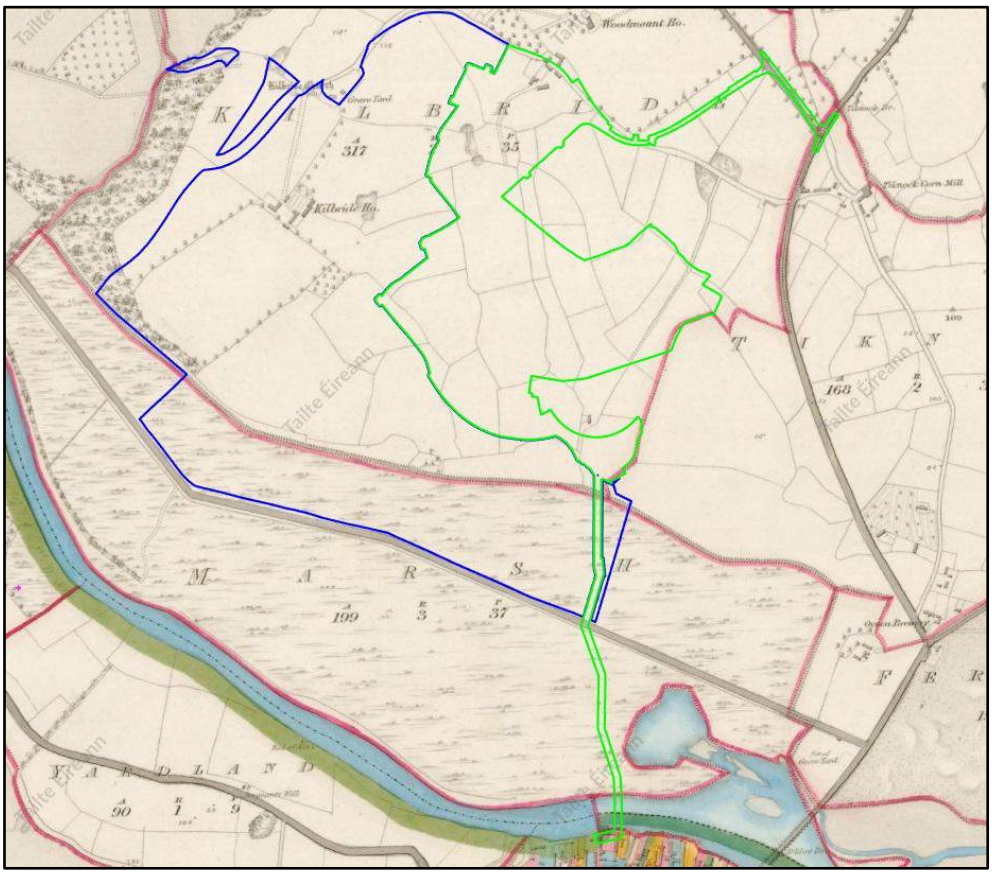


Figure 13.4: Extract from the first edition 6-inch OS map, published 1840, with approximate location of Kilbride lands highlighted (in green) (Tailte Eireann Surveying Licence No. CYAL50392781).

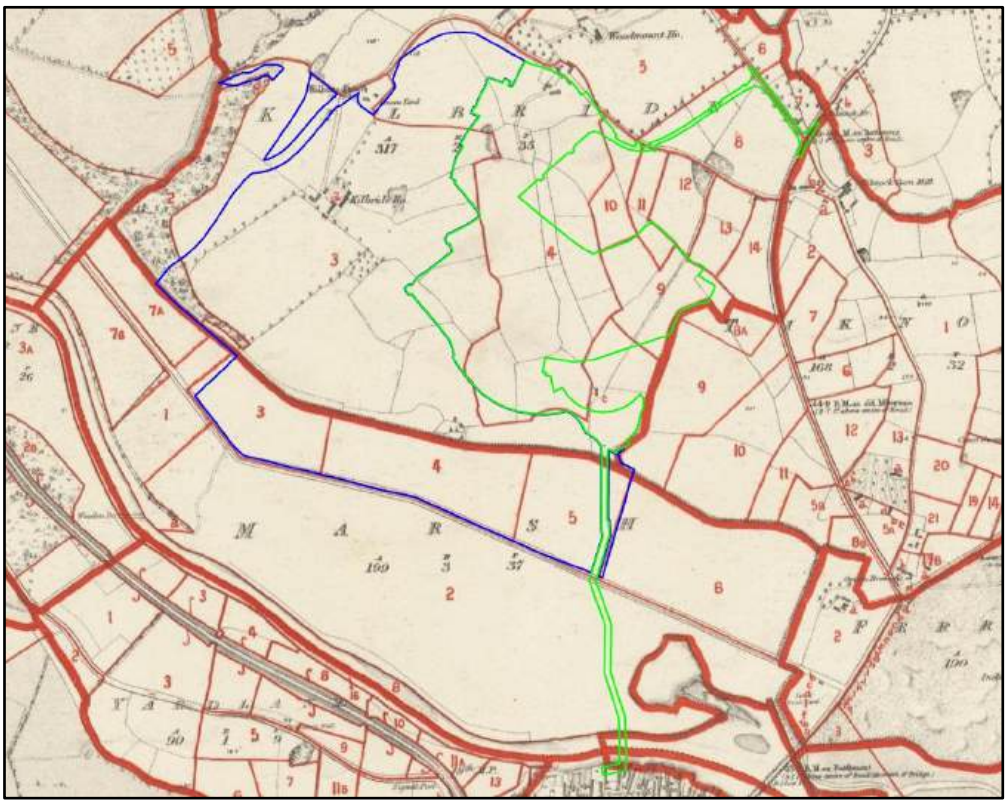


Figure 13.5: Extract from the Primary Valuations map, 1847-1864, with approximate location of Kilbride lands highlighted (in green) (www.askaboutireland.ie).

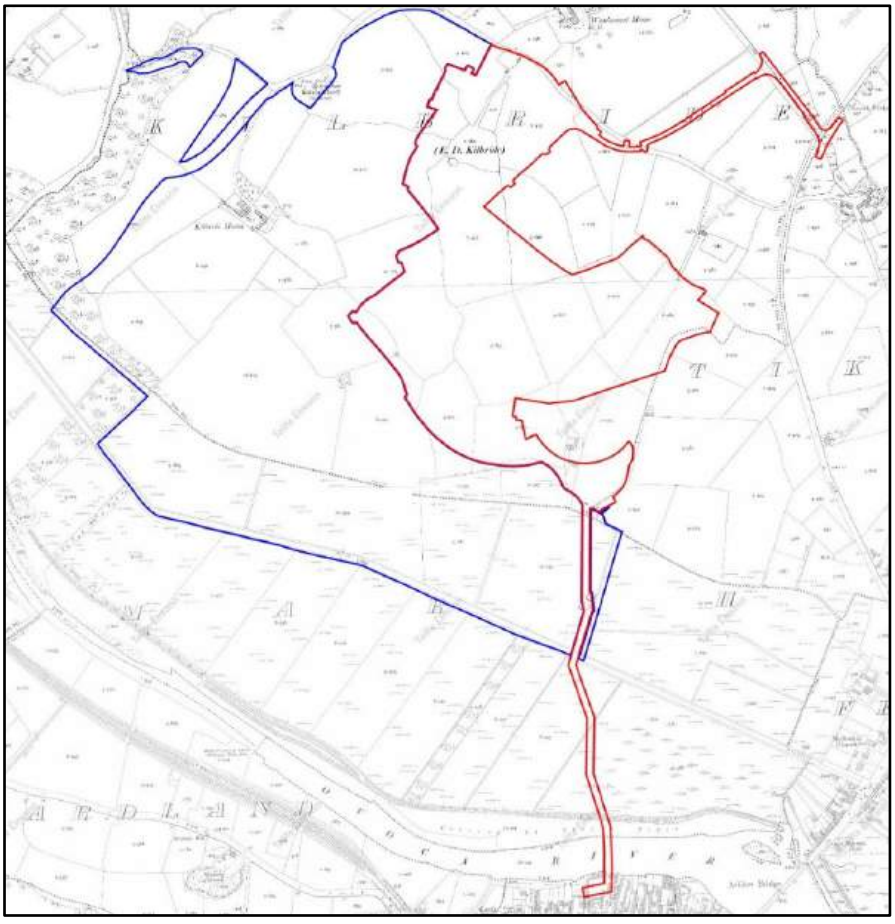


Figure 13.6: Extract from the 25-inch edition OS map, published 1907, with approximate location of Kilbride lands highlighted (in red) (Tailte Eireann Surveying Licence No. CYAL50392781).

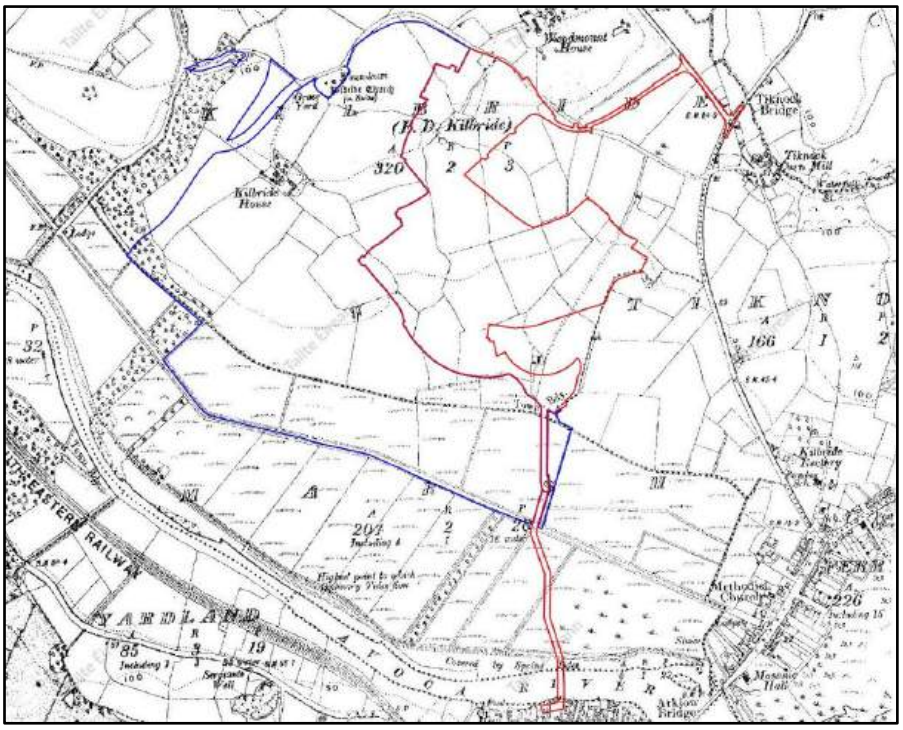


Figure 13.7: Extract from the last historic 6-inch OS map, published 1910, with approximate location of Kilbride lands highlighted (in red) (Tailte Eireann Surveying Licence No. CYAL50392781).

Previous Archaeological Investigations

As mentioned above, the construction of the M11 Arklow Bypass has added greatly to the understanding of prehistoric landuse and settlement activity in the Kilbride area. Monitoring of topsoil stripping on the M11 alignment under licence 97E0083 revealed that the landscape was particularly well settled during the Bronze Age (c. 2400-500BC) (Excavations Database 1997:618, 1998:683). The nature of the features uncovered in Kilbride, subsequently excavated under licence 97E0324 (Excavations Database 1997:616), included postholes, representing a structure, a furnace, numerous spreads of burnt mound material, as well as pits, with pits in nearby Templerainy townland relating to Late Neolithic/Early Bronze Age cremation burials. Objects recovered during subsequent excavations in Kilbride included waste flint flakes from the manufacture of flint implements and Bronze Age pottery, as well as some cremated human bone (Breen and Kelleher 1998).

The proposed Phase 1 Kilbride lands has been the subject of some archaeological mitigation to date, given the archaeological potential highlighted by the archaeological findings on the M11, and by the presence of Kilbride Church and Graveyard. The majority of the Phase 1 development site was subject to a geophysical survey carried out by Earthsound Geophysics in 2019, under detection licence 19R0196 (extent highlighted in yellow on Figure 13.8). The survey identified 16 areas with a strong magnetic response, concluding the majority of responses related to historic or modern landuse. Relict field boundaries were recorded, as well as cultivation furrows and possible stone boundaries. Potential archaeological activity was detected in the form of a series of possible pits, interconnecting ditches and four possible enclosure ditches, one containing possible habitation evidence (Gimson and Hogan 2019).

Subsequent to the geophysical survey, a small part of the area covered by the survey was subjected to archaeological test-excavation, carried out by Shanarc Archaeology under excavation licence 23E0859 (Excavations Database 2024:011). A total of 16 test-trenches, varying in length from 50m to 100m, were excavated in January 2024, specifically targeted on anomalies detected during the 2019 geophysical survey. None of the targeted geophysical anomalies, including at the location of a 19th century house (identified as Anomaly 1 in the geophysical survey), produced archaeological evidence. However, one trench, on the edge of the geophysical survey boundary, labelled Trench 1 on Figure 13.8, identified an archaeological pit (1m x 0.8m) containing a charcoal-rich fill (Greiner and Shanahan 2024). Further archaeological investigation is warranted to address the balance of the anomalies identified in the geophysical survey.

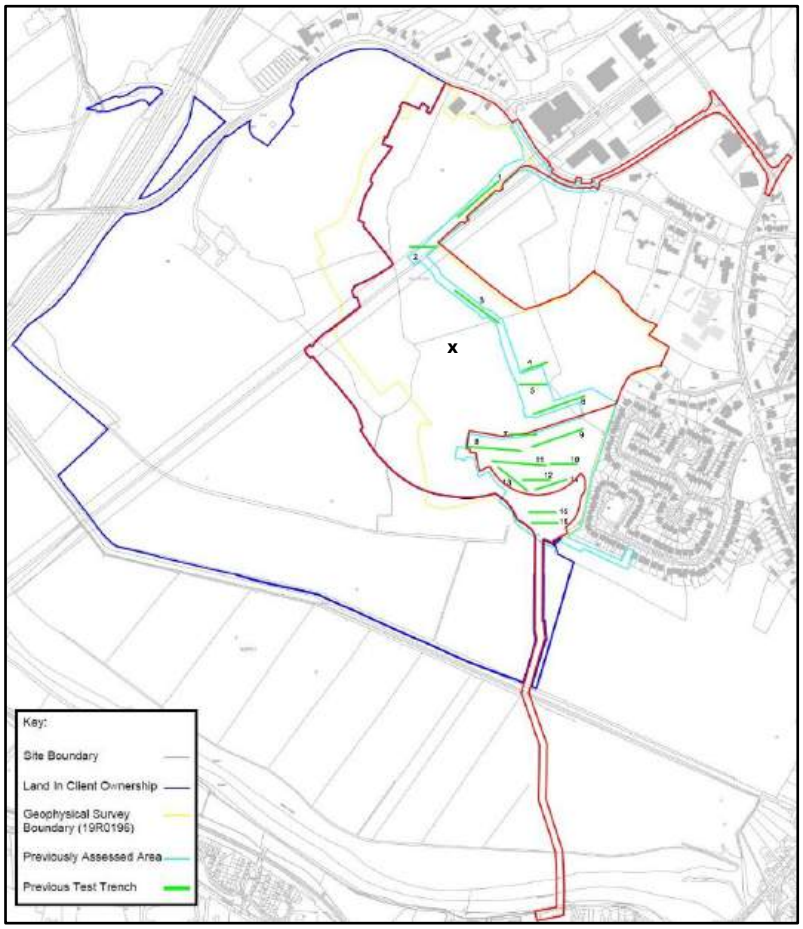


Figure 13.8: Proposed Phase 1 development boundary (in red) relative to archaeological investigations completed to date under geophysical survey (in yellow) licence 19R0196 and test-excavation (in green) licence 23E0859; the approximate location of a stray artefact recently recovered is highlighted with an 'X' (Source: Shanarc Archaeology).

Terrestrial and underwater archaeological investigations have been undertaken as mitigation and to inform both project design and the Environment Impact Assessment Report (EIAR) compiled in relation to the Arklow Flood Relief Scheme. Investigations include archaeological monitoring by Courtney Deery of site investigation (SI) works at the Arklow Town Marsh under excavation licence 18E0263 (Excavations Database 2020:109). Monitoring was associated with 12 window samples taken across the Town Marsh opposite the core of Arklow town in relation to a proposed flood embankment sited partly within the Zone of Archaeological Potential associated with the historic town of Arklow (WI040-029----) and in the vicinity of graveyard site (WI040-029008-). Site investigations were initially to take the form of test pits measuring approximately 2m x 2m, but due to the wet ground conditions experienced in the marsh, test pits were replaced with window sampling (Deery 2020). No

archaeological features, finds or soils were encountered during monitoring of the SI works. It was identified that constraints at the Town Marsh, including waterlogged ground conditions, prohibited archaeological test excavation along the location of the proposed flood embankment, which was initially proposed as preferred archaeological mitigation.

Archaeological test excavations have also been carried out in connection with proposed ancillary site compound locations connected with the Arklow Flood Relief Scheme; archaeological test excavations were carried out RedArc Consulting under excavation licence 20E0675. A site compound location (SC4) proposed on the south bank of the Avoca River, in the public carpark between the recorded location of a former medieval parish church and graveyard, St. Marys (WI040-029003- and WI040-029007-), and the river bank was not tested. It was identified that there was unlikely to be any direct impact on material of archaeological origin at the public carpark during the construction of the Flood Relief Scheme (Tobin 2021). Test excavation in Ferrybank, to the east extent of the Town Marsh, associated with the proposed location of site compound SC1 produced evidence of archaeological activity in the form of cut features and artefacts potentially indicative of both prehistoric and medieval activity.

The Arklow Flood Relief Scheme will comprise dredging work, debris and gravel trap construction and north and south bank flood defence walls on the Avoca River, and an Underwater Archaeological Impact Assessment (UAIA) was carried out by the Archaeological Diving Company Ltd. (ADCO) on the Avoca River channel as it passes through Arklow Town to inform the Flood Relief Scheme. This work comprised a desktop review and detailed swim search of the river channel extending from below the M11 motorway bridge upriver of the town to a point downriver of Arklow Bridge under dive licence 17D0078. 19 features were identified in the river channel, all but two lying upriver of Arklow Bridge, with two features in particular in close proximity of the Flood Relief Scheme Debris and Gravel Traps, infrastructure that will be used to provide a proposed pedestrian/cycle connection to Arklow town as part of the proposed Phase 1 development at the Kilbride lands. The Avoca River is archaeologically sensitive, and the recording of a substantial timber off the north bank and an anchor off the south bank close to the location of the Debris and Gravel Traps during the underwater swim search highlight the potential for the excavation of riverbed and riverbank sediments in this area to retain maritime cultural heritage material (Arklow Flood Relief Scheme EIAR, Chapter 11). Advance underwater archaeological investigation work at the Gravel Trap location, as well as licensed archaeological monitoring of all ground and riverbed disturbances associated with the Arklow Flood Relief Scheme during the construction phase has been specified as on-going archaeological mitigation in connection with the Scheme (Brady 2021).

A geophysical survey was also carried out by J. M. Leigh Surveys Ltd. under detection licence 21R0244, between Kilbride Graveyard and the proposed Phase 1 development at the Kilbride lands, as part of wider research during the compilation of a Conservation Plan for the graveyard and Howard mausoleum, aka 'The Pyramid' (Whitty and Rees 2021). The focus of the survey, on the east side of the graveyard, was to investigate the possibility of enclosing ditches or other archaeological evidence that may indicate an early medieval foundation at the site. Little, if any, potential archaeological features were identified in the survey. The survey identified the remains of two former field boundaries consistent with those depicted on Ordnance Survey maps, as well as several linear responses suggestive of agricultural activity, possibly representing further field divisions (Curran 2021). Some positive linear responses, including one in a rectilinear pattern, were tentatively identified as possible plough-damaged ditched features, with several discrete positive responses suggestive of possible isolated pit features. Further archaeological investigation is warranted to establish the archaeological nature of otherwise of these features.

Aerial Photographs and LiDAR Imagery

Available aerial photographs and LiDAR survey data were examined as sources aiding in the interpretation of potential below ground archaeological remains. Aerial photographs available on GeoHive, a geospatial data hub managed by Tailte Éireann, are labelled 1995, 1996-2000, 2001-2005, 2006-2012, Digital Globe 2011-2013, and Aerial Premium 2013-2018. The images indicate a certain amount of modern agricultural disturbance across the Phase 1 Kilbride lands, with occasional faint crop-marks indicating the lines of former field boundaries, as shown on historic Ordnance Survey maps, as well as modern cultivation evidence. Disturbed ground to the northwest part of the site, visible on the 1995 aerial (Figure 13.9), coincides with a possible quarry/borrow pit or hollow recorded on the first edition 6-inch Ordnance Survey map (Figure 13.4). Aside from this, there is no clear evidence in the consulted aerial photographs to suggest the presence of unrecorded sub-surface archaeological remains.

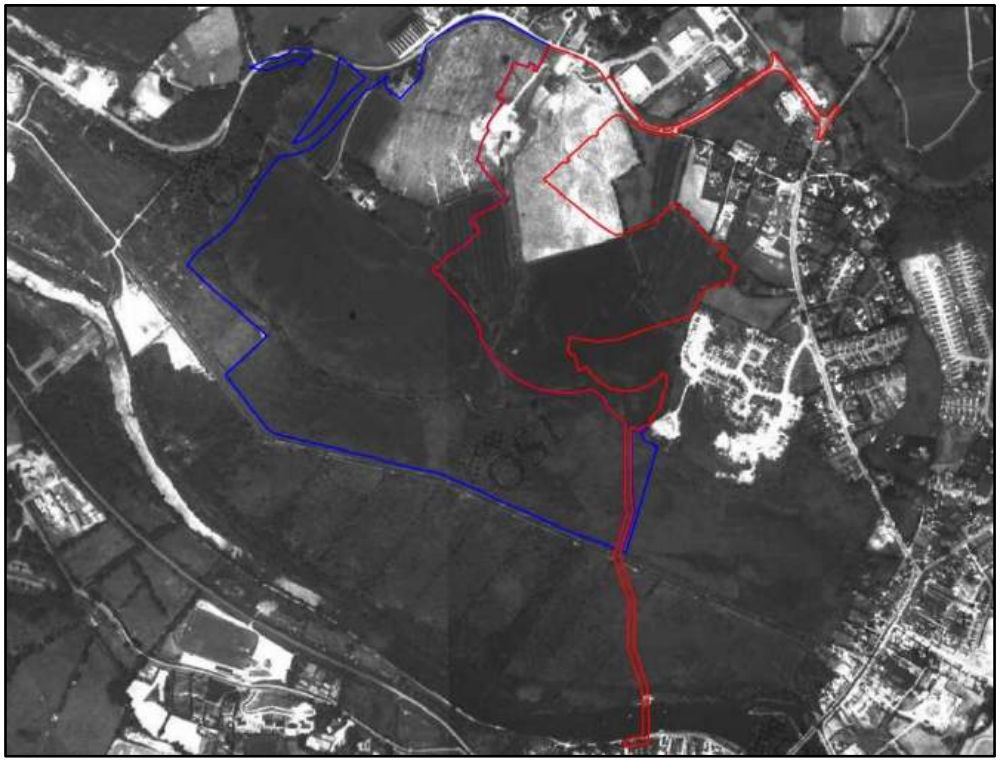


Figure 13.9: Extract from the 1995 aerial photograph with approximate location of Phase 1 Kilbride lands highlighted (in red) (Tailte Eireann Surveying Licence No. CYAL50392781).

The examined LiDAR data (Figure 13.10) comprised the Digital Surface Model (DSM) Hillshade, Office of Public Works (OPW) and National Aerial Survey Contract (NASC) 2m data, dating from 2011. The LiDAR data picks up the undulating nature of the terrain at the Phase 1 Kilbride lands, highlighting the higher points of the site, and clearly captures the location of a possible former quarry/borrow pit or hollow to the northwest part of the site. Also in evidence are modern cultivation or plough trends, along with former field boundaries recorded on historic Ordnance Survey maps. There is no clear evidence in the consulted LiDAR data to suggest the presence of unrecorded sub-surface archaeological remains.

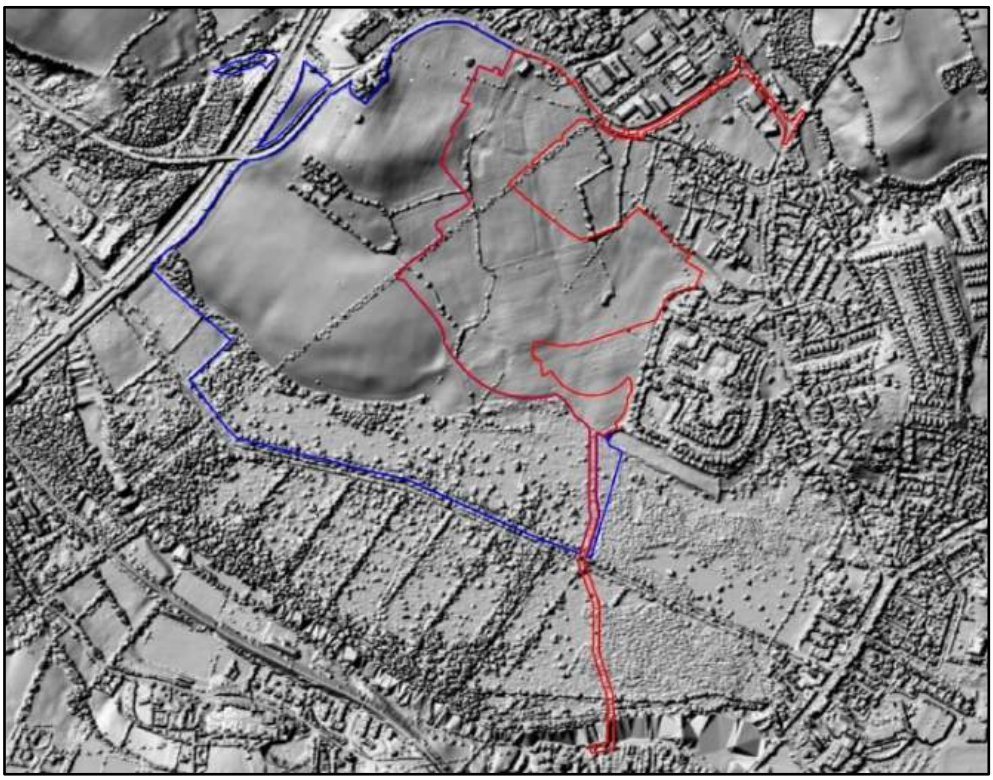


Figure 13.10: Approximate location of Phase 1 Kilbride lands (in blue) relative to available LiDAR data (www.arcgis.com).

Archaeological Artefacts

No findspots of artefacts are currently provenanced in the topographical files of the National Museum of Ireland to Kilbride townland. However, a stray prehistoric bronze axehead has recently been recovered in a ploughed field in the Phase 1 Kilbride lands. The approximate location of the artefact is marked with an 'X' on Figure 13.8. The discovery of the artefact has been reported to the National Museum of Ireland.

National Monuments

No National Monument either in the ownership of the State or vested in Wicklow County Council is located at the Kilbride lands, or within the wider Arklow town area.

Sites and Monuments Record (SMR) and Record of Monuments and Places (RMP)

Table 13.1 lists recorded monuments within a 500m radius of the Phase 1 Kilbride Lands. The locations of recorded monuments relative to the Phase 1 development boundary is shown on Figure 13.11.

The find spot of a font, WI040-044----, is recorded within the boundary of the Phase 1 Kilbride lands (Figure 13.11). Described as a red sandstone block with an oval basin, the font was previously located within the farmyard fronting the Kilbride Road L-6179, on the northern boundary. The font is currently located in St. Patrick's Catholic Church (WI035-058----) in Barranisky West townland, over 5km to the north of the Kilbride lands. The original provenance of the recorded font is unknown, but it may well have come from Kilbride Church and Graveyard.

The complex of recorded monuments at Kilbride Graveyard include the remains of a church WI040-021001-, its associated graveyard WI040-021002-, and the later 18th century Howard mausoleum

WI040-021004-. A redundant record, WI040-021003-, relates to a possible ecclesiastical enclosure, of which no evidence has been found to date in relation to Kilbride Graveyard. Ecclesiastical enclosures usually enclosed early medieval churches and monastic sites, along with associated domestic and industrial activity, and could comprise between one and three enclosures.

The archaeology revealed in advance of the construction of the M11 Arklow by-pass, which included a habitation site (WI040-048----), a furnace (WI040-050----) and burnt spreads/mounds (WI040-051----, WI040-052----), confirms that prehistoric settlement lay west of the Phase 1 Kilbride lands. The sites were positioned on rising ground above marshland on the floodplain of the Avoca River, and highlight a potential for the discovery of other such sites in what is a similar topographic environment within the Phase 1 Kilbride lands.

The historic core of Arklow (WI040-029----) is designated as a Zone of Archaeological Potential (ZAP), and includes the channel of the Avoca River and part of its north bank, in Arklow Town Marsh (Figure 13.11). This zone coincides with a Zone of Notification; these zones do not define the exact extent of recorded monuments, but rather are intended to identify them for the purposes of notification under Section 12 of the National Monument Act 1930 (as amended).

SMR/RMP No.	Class	Townland	ITM Coordinates	Proximity to Phase 1 Kilbride lands (m)
WI040-044----	Font (former location)	Kilbride	724183, 675076	0m
WI040-021001-	Church	Kilbride	723813, 675030	c. 160m[2]
WI040-021002-	Graveyard	Kilbride	723831, 675043	c. 160m
WI040-021003-	Redundant Record	Kilbride	723827, 675025	N/A
WI040-021004-	Mausoleum	Kilbride	723831, 675032	c. 160m
WI040-048----	Habitation Site	Kilbride	723440, 674772	c. 440m
WI040-050----	Furnace	Kilbride	723531, 674863	c. 440m
WI040-051----	Burnt Spread	Kilbride	723623, 675021	c. 400m
WI040-052----	Burnt mound	Kilbride	724042, 675515	c. 360m
WI040-029----	Historic Town	Arklow	724381, 673512	0m

Table 13.1: Recorded archaeological monuments within c. 500m of the Phase 1 Kilbride lands.

[2] Distance from redline boundary to graveyard boundary wall at Kilbride Church and Graveyard

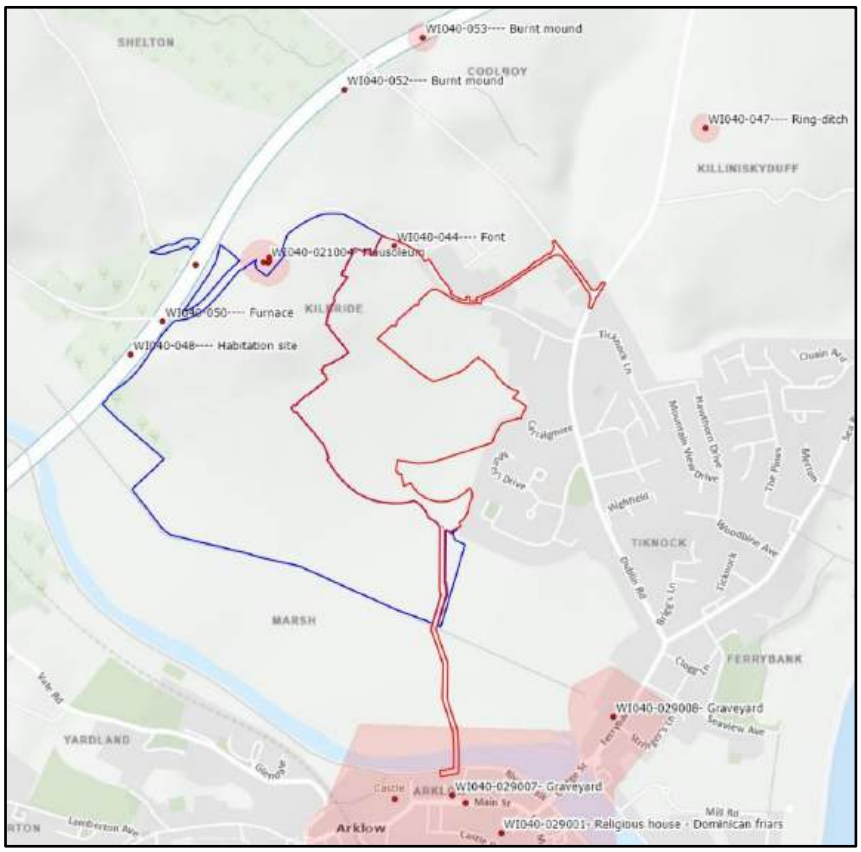


Figure 13.11: Distribution of sites in the SMR and RMP (red dots) relative to location of Phase 1 Kilbride lands (in red); recorded monument Zones of Notification shaded in pink (Tailte Eireann Surveying Licence No. CYAL50392781).

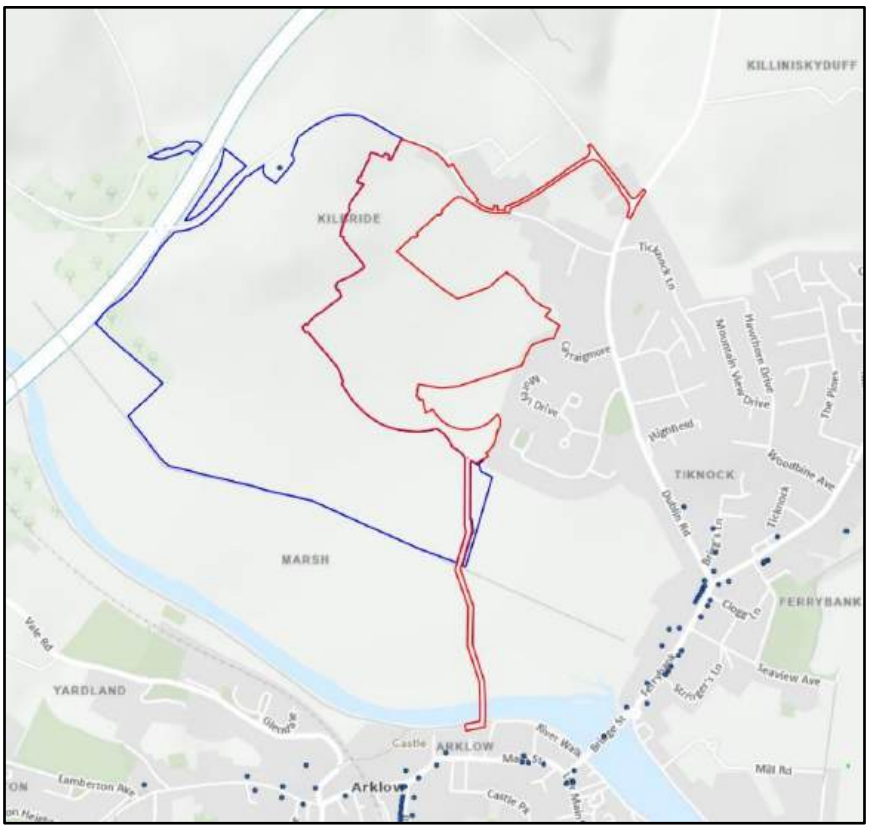


Figure 13.12: Distribution of sites in the NIAH (blue dots) relative to location of Phase 1 development at Kilbride lands (in red) (Tailte Eireann Surveying Licence No. CYAL50392781).

National Inventory of Architectural Heritage

The pyramidal Howard Mausoleum in Kilbride Graveyard is listed in the National Inventory of Architectural Heritage (NIAH) as Reg. No. 16404006 (Figure 13.12). It is given a rating of regional importance, due to its special architectural interest. It is described as a freestanding, single-bay, single-stage mausoleum, dated 1785, on a square plan, constructed of granite ashlar with an inscribed sarcophagus. The pyramidal monument is sited on the highest point in Kilbride Graveyard, and the intent was that it be seen in the surrounding landscape. The NIAH, as part of a more detailed description compiled in April 2013 (part of a 'building of the month' feature) identifies that the monument is "easily seen from most points within a two-mile radius" (www.buildingsofireland.ie/building-of-the-month/howard-mausoleum-kilbride-kilbride-td-arklow-county-wicklow).

Record of Protected Structures

The pyramidal Howard Mausoleum is a protected structure, listed as Ref. No. 40-07 in the Record of Protected Structures (RPS) (Appendix 4) of the Wicklow County Development Plan 2022-2028. The second Howard mausoleum, housing the remains of a minor branch of the Howard family, forms part of the protected structure, described as a small Egyptian style structure with a temple front and tetrastyle in-antis portico.

Site Inspection

A site inspection at the Kilbride lands has verified the baseline scenario identified from desk-based research and evidence. The Phase 1 Kilbride lands comprise parts of six enlarged tillage fields, with a general sloping trend to the south and southeast toward the Town Marsh and Arklow Town, having extensive views in this direction as a result. The marsh was not accessed given its densely vegetated nature. The prominence of Kilbride Graveyard to the west of the Phase 1 Kilbride lands was noted throughout the site, and the pyramidal Howard Mausoleum was visible across the Phase 1 development lands. All of the fields have been tilled, and the visible ground surface was examined for evidence of archaeological objects.

The farmyard fronting the Kilbride Road L-6179, the recorded former location of font WI040-044----, is a wholly modern construct, with a modern, two-storey dwelling house. The font was not original to the farmyard, where it is understood to have been already *ex-situ*, and consequently there is no evidence of antiquity here (Plate 13.1).

The field to the west of the farmyard is dominated by elevated ground at the location of Kilbride Graveyard and pyramidal Howard Mausoleum, which forms part of a ridge oriented NW-SE (Plates 13.2 to 13.4). A moderate number of modern pottery fragments and glass sherds were identified across the exposed surface, along with flint pebbles and a possible waste flint pieces from flint working on the field surface, between the farmyard and Kilbride Graveyard.

The site of Kilbride House was situated in a sheltered location below the S and SE slope of the ridge containing Kilbride Graveyard and pyramidal Howard Mausoleum. The house no longer survives, though elements of its curtilage remain, including its entrance avenue, partly lined on its uphill side with mature holly trees, an area of landscaped ground containing mature trees, and the remains of linear stone-built outbuildings surrounding a modern concerted yard surface that is still in use as a farmyard. The footprint of buildings at Kilbride House site has differed over its history, with historic Ordnance Survey maps showing the house to the northeast of the present yard originally, an area now

covered in mature trees. Post 1837, the house appears to have been demolished. By 1907, the focus of all buildings was to the south side of the entrance avenue. The remaining structures are in part heavily vegetated, and visible outbuilding fabric has in part been heavily modified (Plate 13.5).

The undulating nature of the ground surface was noted, with some slightly higher ridges or mounds being present, any of which could have been a focus of settlement, particularly in prehistory, being south-facing and above resources provided by wetland at the Town Marsh and the Avoca River (Plates 13.6 to 13.8). With the exception of some possible waste flint, indicating possible flint working in the large field to the east of Kilbride Graveyard and pyramidal Howard Mausoleum, no surface features of archaeological interest were identified during the site inspection. There was no surface trace of a former 19th century dwelling, with associated access lane, that survived into the 20th century in the southeast corner of the Phase 1 Kilbride Lands. The location of a possible borrow pit, shown on the first edition Ordnance Survey map (Figure 13.4) and visible in LiDAR imagery (Figure 13.10) is still identifiable on the ground as a hollow close to the northwest boundary of the Phase 1 Kilbride lands (Plate 13.9).

The Avoca River was examined from the south bank at Arklow, from an existing river walk (Plate 13.10). The river was accessed from a public carpark on a north-facing slope between the recorded location of a former medieval parish church and graveyard, St. Marys (WI040-029003- and WI040-029007-), and the river bank. With the exception of a boat slip at the general location of the proposed pedestrian/cycle crossing on the Avoca River, the river bank on the town side comprises a natural earth bank. On the north side, forming part of the Town Marsh, the river bank is lower and lined with mature trees.

Plate 13.1: Modern farmyard making former location of font WI040-0444---- (Shanarc Archaeology 13.11.2024).

Plate 13.2: Siting of Kilbride Graveyard WI040-021002- on ridge, view to WSW (Shanarc Archaeology 13.11.2024).

Plate 13.3: Siting of Kilbride Graveyard WI040-021002- on ridge, view to NW (Shanarc Archaeology 13.11.2024).

Plate 13.4:View to SE across Kilbride lands from Kilbride Graveyard, with extensive views in this direction (Shanarc Archaeology 13.11.2024).

Plate 13.5: Farmyard with nature of surviving stone outbuildings at Kilbride House site (Shanarc Archaeology 13.11.2024).

Plate 13.6: View SE across the southwest and southern boundary of the Phase 1 Kilbride lands to the Town Marsh and Arklow, showing undulating nature of topography (Shanarc Archaeology 13.11.2024).

Plate 13.7: View NW across the Phase 1 Kilbride lands from the SE part of the site (Shanarc Archaeology 13.11.2024).

Plate 13.8: View SW across the Phase 1 Kilbride lands from the NE part of the site (Shanarc Archaeology 13.11.2024).

Plate 13.9: View N across low hollows near the NW boundary of the Phase 1 Kilbride lands, with existing farm shed visible to right of centre (Shanarc Archaeology 13.11.2024).

Plate 13.10: View NNE across the Avoca River from the river walk on the south bank at Arklow town (Shanarc Archaeology 13.11.2024).

13.4 Characteristics of the Proposed Development

A full description of the proposed project is detailed in Chapter 3 of the EIAR.

In respect of the archaeological and cultural heritage resource, the construction phase involves the stripping of topsoil and subsoil to required construction formation depths. Groundworks will take place on dryland and on wetland, which are both land types of archaeological potential.

The provision of residential units, road infrastructure, creches and a shops and service centre will alter the landuse, topography and thereby the current rural and visual setting of the complex of recorded archaeological monuments at Kilbride Graveyard (Church WI040-021001-; Graveyard WI040-021002-, Mausoleum WI040-021004-), the latter, representing the pyramidal Howard Mausoleum, also being a protected structure.

A proposed pedestrian/cycle connection to Arklow town, aligned through the Town Marsh on the north side of the Avoca River, will involve the provision of a boardwalk through the Town Marsh and a bridge crossing on the Avoca River. A minimal impact approach to construction of the boardwalk through the Town Marsh using a mat laying system and piles will minimise potential impacts on potential sub-surface archaeological remains. The proposed bridge crossing on the Avoca River will use Debris Trap infrastructure to be constructed by Wicklow County Council as part of the approved Arklow Flood Relief Scheme. Utilising pre-existing infrastructure to cross the Avoca River that will be subject to terrestrial and underwater archaeological mitigation at the pre-construction and construction phases of the Flood Relief Scheme will mitigate potential additional archaeological impact on the Avoca River banks and bed arising from the proposed development.

The proposed development of the Kilbride lands will be undertaken in phases, with an indicative phasing strategy outlined in a Masterplan Framework for the Kilbride Lands, and construction related activities will not necessarily be confined within the redline of each phase. The resolution of impacts on the archaeological and cultural heritage resource will therefore needed to be considered with the whole of the Kilbride lands in mind and how phased construction will in actuality be undertaken on the ground.

13.5 Potential Impacts

Construction Phase

Groundworks across the whole of the Phase 1 Kilbride lands have the potential to directly impact sub-surface archaeological remains during the construction phase. This includes construction related activities in dryland across the site, in wetland comprising the Town Marsh, and at the bank or in the riverbed of the Avoca River. Archaeological mitigation undertaken to date in relation to the Phase 1 Kilbride lands has identified one archaeological pit, with additional potential archaeological anomalies identified in geophysical survey results. A stray prehistoric bronze axehead has also been recovered from a ploughed field in the Phase 1 Kilbride lands. Archaeological mitigation undertaken in relation to the Arklow Flood Relief Scheme has also established the archaeologically sensitive nature of the Avoca River.

Groundworks at, and around the modern farmyard fronting the Kilbride Road L-6179, in particular around the south and south-east sides of the present curtilage of the associated two-storey dwelling house, have the potential to directly impact sub-surface remains associated with an historic farm settlement at a similar location.

Groundworks or ground disturbance outside the Phase 1 redline boundary have the potential to directly impact sub-surface archaeological remains across the wider Kilbride lands during the construction phase. Activities that can impact the sub-surface archaeological resource include geotechnical works, the formation of temporary construction compounds, plant movement, and materials and spoil stockpiling.

The proposed development will directly impact the rural and visual setting of Kilbride Graveyard and the pyramidal Howard Mausoleum sited in Kilbride Graveyard.

The location of Kilbride House and the surviving elements of its curtilage are situated outside the Phase 1 boundary, and should not be directly impacted as a result of the proposed Phase 1 development. The site may indirectly be impacted if used in any form during the Phase 1 construction phase.

Operational Phase

If migration measures are carried out at the pre-construction and construction phases of development, adequately covering all land that will be subjected to construction related disturbance, then there will be no potential direct impacts on sub-surface archaeological remains at the operational phase.

The operation phase of the proposed Phase 1 development of the Kilbride lands will directly impact the rural and visual setting of Kilbride Graveyard and the pyramidal Howard Mausoleum sited in Kilbride Graveyard. Maintaining a wide and open land buffer between Kilbride Graveyard and the Phase 1 boundary that retains the existing elevation and views and vistas southwards and south-eastwards at the Graveyard, will reduce the extent and severity of the change in setting.

The increase in population at the Kilbride lands during the operational phase may result in indirect impacts at Kilbride Graveyard. Indirect impacts can include surface erosion, disturbance to masonry fabric, vandalised headstones and accumulation of waste.

13.6 Potential Cumulative Impacts

The phased development of the Kilbride lands will cumulatively directly impact the rural and visual setting of Kilbride Graveyard and the pyramidal Howard Mausoleum sited in Kilbride Graveyard. The wide open land buffer between Kilbride Graveyard and the Phase 1 boundary will be reduced during a second phase of development at the Kilbride lands.

Further increases of population arising from phased development of the Kilbride lands could potentially result in indirect impacts on Kilbride Graveyard, from increased usage.

A second phase of development will directly impact the site of Kilbride House and surviving elements of its curtilage.

13.7 Mitigation Measures

Mitigation measures in respect of the archaeological and cultural heritage resource shall commence at the pre-construction stage.

On-going archaeological investigation is warranted at the Phase 1 development lands to address its known archaeological potential - based on the identification of an archaeological pit and the recovery of a stray prehistoric axehead – and to address anomalies identified in geophysical survey results. On-going archaeological investigation shall take the form of archaeological test-excavation, which shall be carried out under licence to the National Monuments Service (Department of Housing, Local Government and Heritage) and the National Museum of Ireland, in accordance with Section 26 of the National Monuments Act 1930 (as amended). A metal detector shall be used by an archaeologist to scan the topsoil removed from test trenches to recover any potential additional metal artefacts. Metal detection shall also be carried out under licence to the National Monuments Service (Department of Housing, Local Government and Heritage) and the National Museum of Ireland.

Any significant archaeological remains exposed during test-excavation shall be considered for avoidance of impact i.e. avoidance through re-design in the first instance, and only subject to full archaeological excavation i.e. preservation by record in the event that avoidance through re-design is not possible. Any strategy for the avoidance or excavation of archaeological remains shall be carried out in consultation, and in agreement with the statutory authorities.

The wider Kilbride lands should be considered in any pre-construction mitigation strategy to ensure that any land potentially subject to development related groundworks during Phase 1 works shall be archaeologically resolved prior to commencement of construction related activities.

Design strategies to reduce the significant change in the setting of Kilbride Graveyard and the pyramidal Howard Mausoleum have been considered in the design of the proposed development. The Masterplan Framework for the Kilbride Lands has considered the provision of a green buffer to be provided around Kilbride Graveyard, and the maintenance of the site's open vista southwards and south-eastwards towards Arklow town and the coastline. The establishment of a green buffer should be sufficiently sized to maintain the graveyard and Howard Mausoleum's visual dominance in the

landscape, and the sites elevation above proposed development heights. Landscaping of an open green buffer or any spine of open space established to maintains views to and from the graveyard should not be designed in a way that impedes the graveyards current visibility from the surrounding landscape. No construction activities should be carried out in the open green buffer to protect the existing topography, sense of open space and vistas at Kilbride Graveyard.

The ownership of Kilbride Graveyard has passed to Wicklow County Council to ensure the sustainable long-term conservation of the site, including the pyramidal Howard Mausoleum. Wicklow County Council has to date facilitated the preparation of a Conservation Plan (Whitty and Rees 2021), completed as an action of the County Wicklow Heritage Plan. The Conservation Plan enhances the understanding of the Kilbride Graveyard site, provides steps to conserve the site as a community asset, and will form the basis for future funding for conservation works at the site. An on-going management and maintenance plan for the upkeep of the graveyard is to be drawn up by Wicklow County Council as a recommendation of the Conservation Plan.

The proposed bridge crossing relating to the pedestrian/cycle connection to Arklow town will be constructed following the installation of Debris and Gravel Trap infrastructure on the Avoca River associated with the approved Arklow Flood Relief Scheme. The Flood Relief Scheme will be subject to archaeological mitigation and it is anticipated that the location of the proposed pedestrian/cycle bridge will be archaeologically resolved prior to construction. It will be necessary to consult with Arklow Flood Relief Scheme archaeological mitigation reporting documents in advance to confirm the extent of archaeological resolution at the proposed bridge crossing.

Construction Phase

Archaeological monitoring of topsoil stripping across the Phase 1 development site shall be carried under licence to the National Monuments Service (Department of Housing, Local Government and Heritage) and the National Museum of Ireland. Monitoring will include all works in the Town Marsh, which may not be suitable for pre-construction archaeological test-excavation, subject to ground conditions or natural heritage constraints. Any potential groundworks at the Avoca River bank or in the riverbed shall also be monitored by an appropriately qualified or maritime archaeologist unless otherwise archaeologically resolved in advance as part of the Arklow Flood Relief Scheme works. Should archaeological features or material be uncovered during the construction phase, on-going archaeological mitigation shall be made in agreement with the statutory bodies.

The position of potential construction compounds and storage locations for materials and spoil shall be agreed in advance, and prior to any groundworks connected with such activities, with an archaeologist.

Operational Phase

No operational phase mitigation is recommended in the event pre-construction and construction phase mitigation is carried out in full.

13.8 Predicted Impacts

Pre-construction archaeological mitigation shall identify the nature and extent of potential sub-surface archaeological remains at the proposed Phase 1 development lands. Confirmed archaeology

shall be avoided where possible, or resolved via excavation at this stage. Archaeological mitigation undertaken to date in relation to the Phase 1 lands has identified one archaeological pit, additional potential archaeological anomalies have been identified in geophysical survey results and a stray prehistoric bronze axehead has been recovered. The current archaeological record in the surrounding landscape, revealed in advance of the construction of the M11 Arklow by-pass on similarly rising ground above marshland on the floodplain of the Avoca River, highlights the potential for the discovery of similar sites in what is a similar topographic environment within the Phase 1 Kilbride lands.

Construction Phase

Groundworks across the whole of the Phase 1 Kilbride lands will directly impact sub-surface archaeological remains that may be exposed during monitoring of topsoil stripping or other required groundworks at the construction phase. Pre-construction archaeological mitigation may not be practicable in the Town Marsh due to wet ground conditions or natural heritage constraints, and mitigation will need to be addressed during the construction phase.

Operational Phase

The proposed development will directly impact the rural and visual setting of Kilbride Graveyard and the pyramidal Howard Mausoleum sited in Kilbride Graveyard. The establishment of a sufficiently sized green buffer to maintain the graveyard and Howard Mausoleum's visual dominance in the landscape, the sites elevation above proposed development heights, and open views southwards and south-eastwards will reduce the severity of the impact.

13.9 'Do Nothing' Scenario

In a 'Do Nothing' scenario potential sub-surface archaeological material will remain *in situ* at the Kilbride lands and the current elevated and rural setting of Kilbride Graveyard and the pyramidal Howard Mausoleum in Kilbride Graveyard will be maintained.

13.10 Worst Case Scenario

In a 'Worst Case' scenario potential sub-surface archaeological material will be directly impacted and unresolved through standard archaeological mitigation measures, leading to a loss of archaeological data in respect of early landuse and settlement evidence of the Kilbride lands and wider Arklow environs.

In a 'Worst Case' scenario, in the absence of special consideration of current elevation, views and vistas, the rural and visual setting of Kilbride Graveyard and the pyramidal Howard Mausoleum in Kilbride Graveyard will be irrevocably altered.

13.11 Monitoring & Reinstatement

There are no monitoring and reinstatement requirements in respect of the archaeological and cultural heritage resource.

13.12 Difficulties in Compiling Information

There were no difficulties in compiling information for this chapter of the EIAR.

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https://www.askaboutireland.ie	Ordnance Survey Letters Wicklow; *A Topographical Dictionary of Ireland*

14. Material Assets

14.1 Introduction

This chapter addresses issues relating to the material assets of surface water drainage, Wastewater drainage, water supply and utilities (electricity, telecommunications, and gas) in respect of the subject lands and assesses the impact of the proposed development on these aspects of the existing environment. Where necessary, mitigation measures are proposed together with monitoring to ensure the effective implementation of mitigation measures.

This chapter has been prepared by Donnachadh of Donnachadh O'Brien & Associates Consulting Engineers. Donnachadh is a Chartered Engineer and a Fellow of the Association of Consulting Engineers of Ireland with over 30 years' experience as a Consulting Civil & Structural Engineer. Donnachadh has extensive experience in the design and delivery of residential development schemes and has advised clients including government bodies, local authorities and private developers. Relevant projects include the Blackpitts Mixed Use Development, Dublin 8, Oldtown Woods, Celbridge, Co. Kildare and Southgreen Road Residential Development, Dunmurray, Co. Kildare

14.2 Methodology

Scoping

This chapter has been prepared having regard to the following guidelines;

- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017)
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports – Draft (EPA, 2017)

The following sources of information were used in the completion of this assessment:

- Wicklow County Council Drainage Maps (for Wastewater and Surface Water drainage);
- Wicklow County Council County Development Plan (2022 – 2028);
- Uisce Éireann (UE) Water and Wastewater Utility Plans;
- Submission of a Pre-Connection Enquiry to UE;
- Submission of a Statement of Design Acceptance request;
- Murphy Surveys Ground Penetrating Radar (GPR) drawings;
- Bord Gais/ Gas Networks Ireland service maps;
- ESB Service maps;
- Telecoms/ Eir Service Maps;

14.3 Receiving Environment

The sections below describe the baseline environment under the following headings;

- Surface Water
- Wastewater Drainage
- Water Supply
- ESB/Electricity
- Telecommunications

- Gas

Surface Water Drainage

There is no formal surface water network on site with run-off from the greenfield eventually discharging via overland flows and adjacent dry ditches to the Marsh area, located to the south of the proposed development. An existing combined network to the north/ north east of the site along monument lane serves the existing properties along the same.

There is a combined drainage network to the south east of the proposed development, serving Avondale Crescent and adjacent existing developments. This network runs along the south of the existing housing developments in an eastern direction and discharges to the main combined sewer on the R772 as seen in Figure 14.1 above.

Surface Water Discharge Location	Pre- Development Discharge Rate l/s
Overland Flows to March at Greenfield Rates	173.91l/s
Total Pre- Development SW Discharge	**173.91l/s**

Table 14.1: Surface Water Discharge

Figure 14.1: Existing Surface Water (Including Combined Network)

Wastewater Drainage

No formal existing Wastewater infrastructure is located on the subject site of relevance to the proposed development.

There is a combined drainage network to the south east of the proposed development, serving Avondale Crescent and adjacent existing developments. This network runs along the south of the existing housing developments in an eastern direction and discharges to the main combined sewer on the R772 as seen in Figure 14.1 above.

Water Supply

No formal existing potable water infrastructure is located on the subject site , however, Uisce Eireann record indicate the presence of the following:

- A 315mm High-Performance Polyethylene (HPPE) watermain to the east of the site on the R772;
- A 6' Asbestos main along Monument Lane to the north- east of the site;
- A 50mm uPVC main along the existing L6179 road to the north of the site;

The existing Watermain layout for the development is indicated below in Figure 14.2.

Figure 14.2: Existing Water Supply Services

ESB/ Electricity

ESB maintains overhead power lines within and around the proposed development site as indicated in Figure 14.3 below. ESB's infrastructure of relevance to the proposed development includes the following:

- 38KV & higher voltage overhead lines
- MV(10KV/20KV) overhead lines

Please refer to M&E engineers' drawings for details on the existing services.

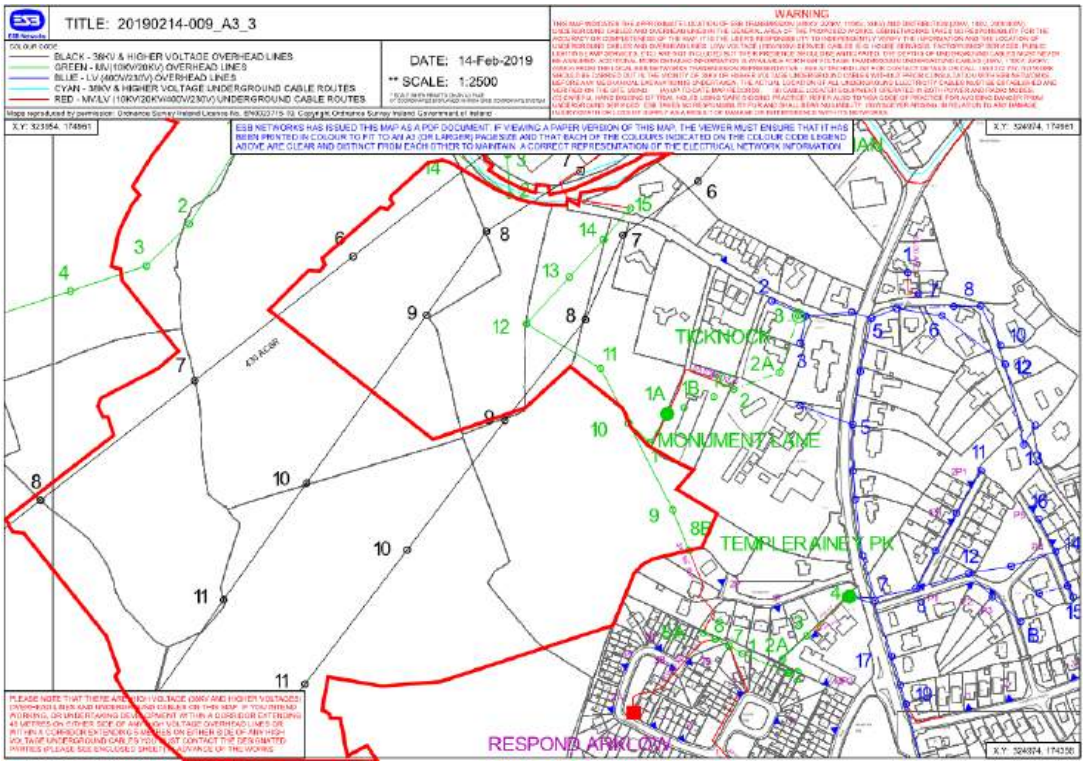

Figure 14.3: Existing ESB Networks/ Electricity Services in the vicinity

Telecommunications

Telecoms services are in the form of underground cables and run along Monument Lane northeast of the site.

Refer to M&E Engineers' drawings for details on existing telecom services.

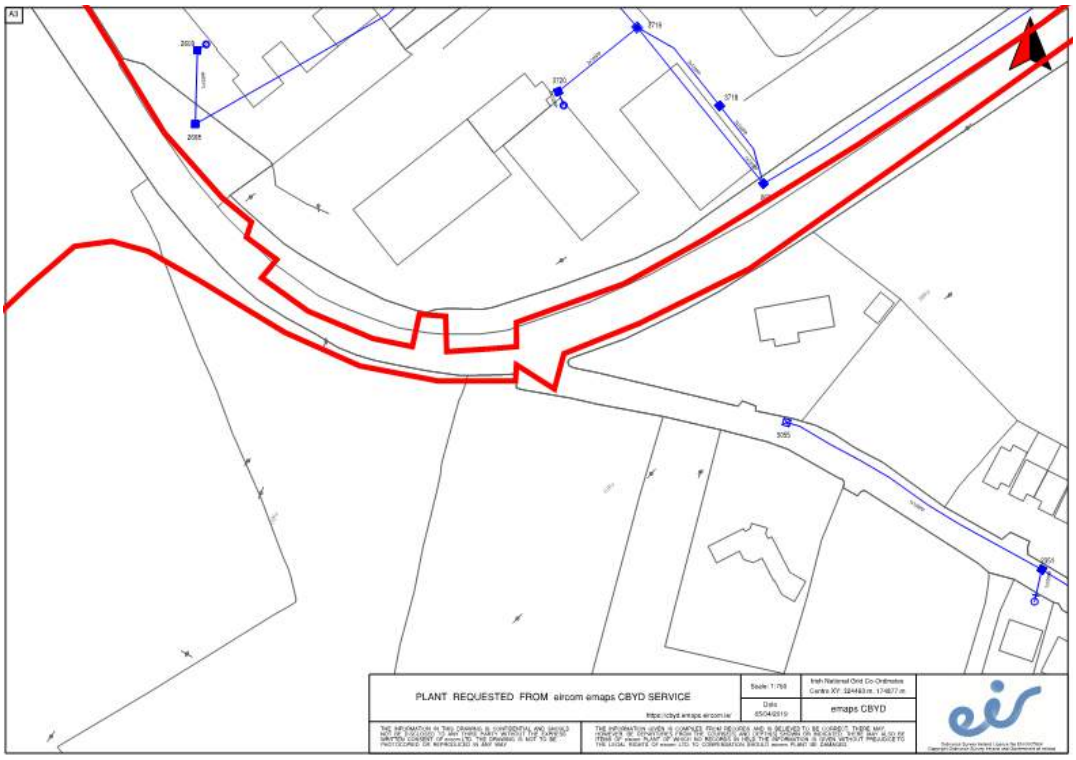

Figure 14.4: Existing Telecommunications services

Gas

The gas main infrastructure of relevance to the proposed development in the form of 180 PE 4 bar run along Monument Lane northeast of the site and 315 PE 4 bar run along the R772 to the east as indicated in figure 14.5 below.

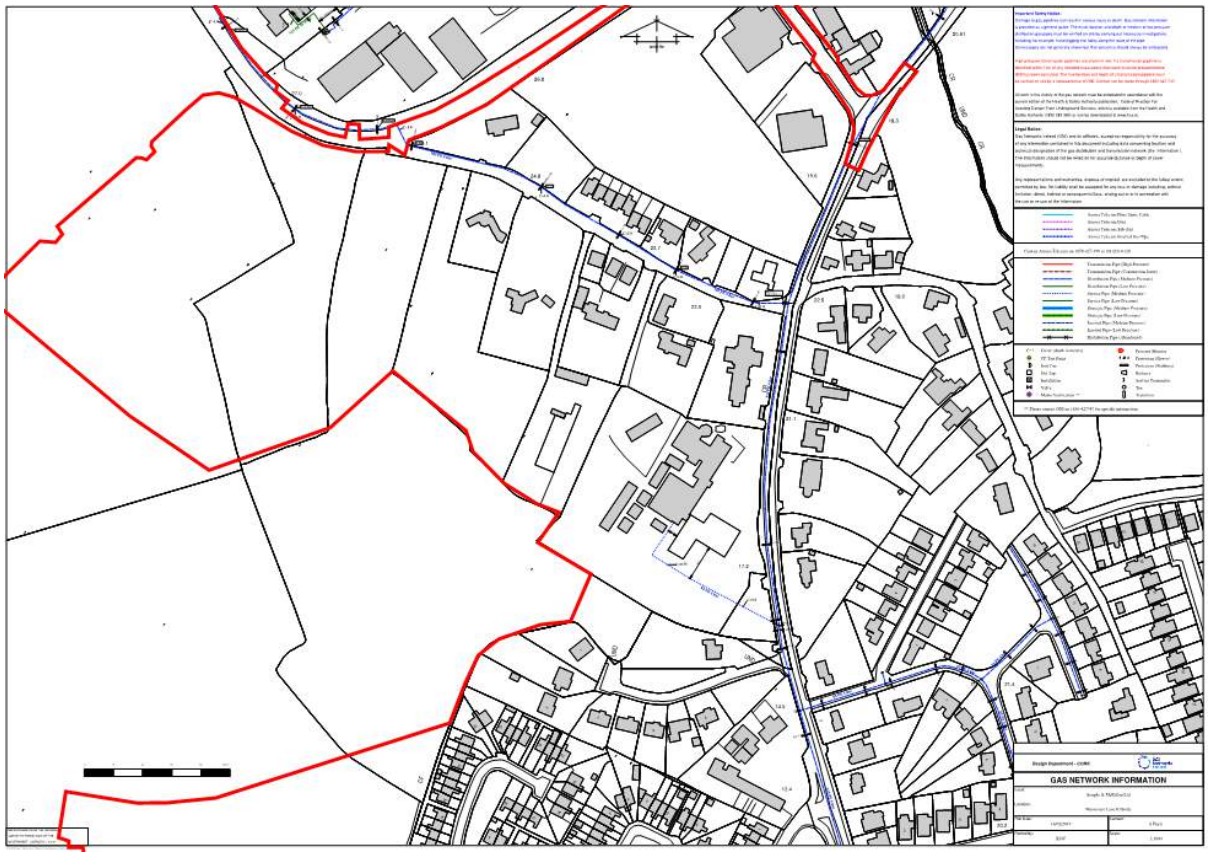

Figure 14.5: Existing Gas Services

14.4 Characteristics of the Proposed Development

Description of Site

The proposed mixed use large scale Residential Development will result in the demolition of an existing dwelling and 2 no. sheds/outbuildings and the construction of 666 no. residential units with a mix of semidetached and terraced houses along with duplex apartments and apartments. These will comprise 1, 2, 3 and 4 bed units. All residential units will have associated private open space facing north/ south/ east/ west. The proposal will also deliver a local centre containing 3 no. retail units, 3 no. community/ medical units and 1 no. creche unit.

A new pedestrian/ cyclist link is provided via a new boardwalk and bridge across the marsh and over the Avoca River adjoining the existing greenway and the Main Street. A new road providing vehicular access is also proposed connecting to the north to Kilbride Road along with road improvements in the surrounding area.

The development will also provide for landscaping, public open spaces and all associated site development works to enable the development including boundary treatments, attenuation storage area and other service provision including ESB works.

14.5 Potential Impacts

Construction Phase

Surface Water Drainage

During the demolition and construction phase; in the absence of mitigation measures, surface water from the existing development shall continue to flow generally south / southeast towards the existing Avoca marsh. There are also existing dry drainage ditches to which surface water discharges.

The following are the potential impacts of the proposed scheme during the construction stage:

- Mobilization of sediments and harmful substances during the construction phase, due to exposed soil and earth movement/ excavation, which may be flushed into the adjacent 'dry ditches' or the Marsh to the south during rainfall events.
- Accidental spills of harmful substances such as petrol/ diesel or oil during the delivery and storage of harmful substances or by leakages from construction machinery. Construction materials such as concrete and cement are alkaline and corrosive and can cause pollution in watercourses.
- Potential for building materials or silts to be washed into the watercourses, causing blockages and pollution. Waterborne silt can arise from dewatering excavations, exposed ground, stockpiles and site roads. Heavy siltation or grit in the surface water runoff would lead to issues for the receiving surface water environments.

In the absence of mitigation measures, these potential impacts are considered to be adverse, significant and temporary.

Wastewater Drainage

Temporary dewatering measures will be necessary to manage water within excavations. Water collected in temporary excavations shall be pumped to tanks on site and treated before discharge to the public wastewater network at a flow rate and location subject to the discharge license from Uisce Eireann.

The Contractor's welfare facilities for construction personnel will be located on site in the contractor's compound and temporary wastewater effluent from these facilities shall be discharged to the sewerage system at a location and at a flow rate subject to the conditions of a discharge license from Uisce Eireann. Details of the wastewater effluent disposal shall be confirmed prior to the commencement of construction as part of the contractor's construction management plan

Temporary discharge from excavations could potentially lead to siltation, surcharge and flooding within the public Wastewater system while effluent from the Contractor's temporary welfare facilities could potentially lead to flooding within the sewerage system.

In the absence of mitigation measures, these potential impacts are considered to be adverse, significant and temporary.

Water Supply

During the Demolition and Construction phase, the Contractor shall install temporary facilities on site for construction personnel. The water demands during the Demolition and Construction Phase arising from the Contractors

Welfare facilities on the existing water supply networks are considered to have a neutral and imperceptible effect with a short-term duration.

Electricity

Electricity will be required for the construction activities for temporary lighting, equipment use etc. It is anticipated that a temporary connection will be taken from the existing LV supply which will facilitate electricity supply to the site during construction, subject to the appropriate agreements. The power demands during the construction phase on the existing electricity network are considered to be imperceptible, neutral and have a short-term effect.

Where the excavation strategy or temporary works require any temporary diversion of services or utilities on the site perimeter, this would be undertaken with prior agreement of the relevant service provider.

A negative, moderate, short-term effect is identified where utility diversions are required.

Telecommunications

There are no existing telecommunications infrastructure within the subject site of the proposed development and all existing telecommunication cables in adjacent developments in close proximity to the subject site are located in underground ducts within the adjacent roads. As such, there will be no likely significant effects on telecommunications infrastructure during the demolition and construction phase of the proposed development.

Where the excavation strategy or temporary works require any temporary diversion of local telecommunication services or utilities on the site perimeter, this would be undertaken with prior agreement of the relevant service provider.

These works are considered as neutral, imperceptible and with a short- term duration

Gas

There is no gas infrastructure on the subject site and it is not proposed to provide gas as a utility within the proposed development. Where the excavation strategy or temporary works require any temporary diversion of local gas services on the site perimeter, this would be undertaken with prior agreement of the relevant service provider. These works are considered as neutral with an imperceptible effect and with a short-term duration.

Operational Phase

Surface Water Drainage

The Surface Water run-off from the existing undeveloped greenfield site flows overland in a southernly direction towards ‘dry ditches’ and the Southern Marsh. The estimated greenfield runoff rate for the subject site is 173.91l/s

The proposed development, shall implement SuDS measures to achieve a 2-stage treatment process which will intercept Surface Water run-off and treat the water by a minimum of two stages of filtration

and treatment through Nature Based SuDS (NBS) measures and conveying this water to storage facilities.

The proposed discharge from the development will be in two locations. The Eastern watercourse to the South-East of the development and an existing 'dry ditch to the South- West; both discharging prior to the discharge to the Southern March. The proposed discharge rates will match the existing greenfield run off rates and therefore, the impacts on Surface Water discharge from the site during the operational phase of the development are considered to be neutral, not significant and permanent.

Surface Water Discharge Location	Pre- Development Discharge Rate l/s	Post-Development Discharge Rate l/s	Decrease in SW Discharge (%)
Overland Flows to March at Greenfield Rates	173.91l/s	-	
Eastern Catchment Discharge to Eastern Watercourse	-	108.08l/s	
Western Catchment Discharge to Western 'Dry Ditch'	-	65.83l/s	
Total Pre- Development SW Discharge	**173.91l/s**	**173.91l/s**	**0**

Table 14.2: Proposed Post- Development Surface Water Flows

Wastewater Drainage

Uisce Éireann have advised, through the Connection and Developer Services (CDS) Confirmation of Feasibility Letter, that a connection from the proposed development to the Uisce Eireann Wastewater infrastructure is feasible subject to upgrade works on the existing line.

The Client has liaised with Uisce Eireann regarding the proposed Uisce Eireann upgrade works and has entered into a Public Works Service Agreement which will see the existing combined network to the south of Avondale Crescent to the R772 (See Figure 12.1) be upgraded to a 450mm diameter pipe to facilitate the proposed development. The proposed wastewater upgrade works will be undertaken by others under the management of Uisce Eireann. The upgrade works is intended to increase capacity in the downstream network and is now feasible given the increased capacity at the WwTP which is due for completion in 2025.

Uisce Eireann have provided a statement of design acceptance in respect to the proposed wastewater layout and design.

As such, it is considered that the impacts on the existing wastewater network are considered to be positive, significant and permanent.

Water Supply

Uisce Éireann have advised, through the Connection and Developer Services (CDS) Confirmation of Feasibility Letter, that a connection to the water supply network is feasible subject to upgrade works. Additionally, Uisce Eireann have provided a Design Statement of Acceptance in respect to the proposed Water Supply layout and design.

As such, it is considered that the impacts on the existing Water Supply network are considered to be positive, significant and permanent.

A pre-connection enquiry was submitted to Uisce Éireann outlining the proposed upgrade works and connection to the public water supply system. We have received a Confirmation of Feasibility (CoF) letter from Uisce Éireann based on the proposed water supply strategy outlined in the pre-connection enquiry.

Electricity

The proposed development will increase the demand on the electricity supply system. However, it is expected that infrastructural requirements for future development will be accommodated by ESB Networks.

Therefore, the impact of the proposed development on the electricity supply network is expected to be neutral, not significant and permanent.

Telecommunications

The proposed development will increase the demand on the telecommunications systems which may potentially lead to a reduction in the level of service to existing customers. It is expected that infrastructural requirements for future development will be accommodated by utility service providers. In the absence of mitigation measures,

These potential impacts are considered to be adverse, slight and permanent.

Gas

There is no gas infrastructure on site and it is not proposed to provide gas as a utility within the proposed development. Therefore, it is considered the impact on the existing gas network are neutral, imperceptible and permanent.

14.6 Potential Cumulative Impacts

Cumulative effects can be defined as the effects on the environment that result from incremental changes caused by the combination of the proposed development together with other past, present and reasonably foreseeable future developments. Cumulative effects may arise from:

- The interaction between the various impacts within a single project.
- The interaction between all of the different existing and/or approved projects in the same area as the proposed project.

This section sets out the interaction that the proposed development has with different existing and / or approved projects in the same area.

Approved Plans / Projects

The site is adjacent to a recently granted 84 units scheme which was submitted by the same client as this application relates to (ABP Ref. ABP-319604-24 & Wicklow Co. Co. Ref. 23/756). These material assets significantly interact with the proposed development with respect to Material Assets: Built Services as they have been designed in conjunction with the overall scheme.

The site is also adjacent to the KWETB proposed school site (Planning Ref. 22/213), which has received planning permission by Wicklow County Council.

Future Plans

This submission consists of the initial phase of a large residential development, to be provided over the coming years. The overall proposed masterplan seeks to provide c.1500 residential units, creches, local centre, the first phase of a future regional road for Arklow town, new roads connecting the site to the surrounding areas and a pedestrian / cycle paths.

In the absence of detailed proposals for the various transportation initiatives and management measures to be applied to the project it has not been possible to determine their cumulative effect with the project on the Material Assets: Built Services.

14.7 Mitigation Measures

Construction Phase

Surface Water

The Contractor shall prepare and implement a Demolition & Construction Phase Surface Water Management Plan that ensures avoidance and minimization of effects. This Surface Water Management Plan will be based on the measures outlined in the Construction Management Plan included with this application and include the following mitigation measures.

- All water leaving the site during construction will be desilted using standard techniques including silt buster/silt socks etc.
- Ground water or run-off that collects in excavations or foundation trenches will be drained or pumped to a construction site water treatment arrangement rather than flowing south towards the marshland area. The water is to be directed into a proprietary settlement tank, with a proprietary 'silt bag' to intercept bulk silt volumes. The water and silt within the unit is to be emptied into a water vacuum tanker and is then to be disposed of off-site to a licenced facility.
- Desilting and petrochemical interception of all surface runoff/pumped water will take place for the length of the construction project.
- A petrochemical interceptor will be placed on the surface water network prior to discharge.
- Local silt traps established throughout site.
- Mitigation measures on site include dust control, stockpiling away from watercourse and drains
- Stockpiling of loose materials will be a minimum of 20m from drains/ watercourses.
- Stockpiles and runoff areas following clearance will have suitable silt barriers to prevent runoff of fines into drainage systems/ watercourses/ March.
- Fuel, oil and chemical storage will be sited within a bunded area. The bund will be at least 50m away from drains, excavations and other locations where it may cause pollution.
- Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination. Any water-filled excavations, including the attenuation tank during construction, that require pumping will not directly discharge to the adjacent watercourses/ Marsh. Prior to discharge of water from excavations adequate filtration and petrochemical interception will be provided to ensure no deterioration of water quality and ensure compliance with the Water Pollution Acts.

- Site layout during excavation works will be designed to ensure vehicles do not enter the works area unless necessary for the excavation and soil removal processes. All machinery leaving the works area will be thoroughly cleaned before being allowed on to public roads. A road sweeper (including vacuum) will be in place (as required) to unsure cleanliness of nearby and haul roads (where necessary), particularly during enabling works.
- Dust may deposit on surrounding roads thus entering into the surface water network. Effective site management regarding dust emissions will be carried out.

Wastewater Drainage

The proposed Wastewater drainage system has designed in accordance with the Irish Water Code of Practice for Wastewater Infrastructure IW-CDS-5030-02, IS EN 12056:2000 Gravity Drainage Systems inside Buildings, I.S. EN752: 2017 Drain & Sewer Systems outside Buildings and the Building Regulations Technical Guidance Document Part H. The proposed drainage system will therefore be designed with appropriate capacity for the development to ensure self-cleansing velocities are achieved to reduce the risk of blockages and odours.

The Contractor's welfare facilities for construction personnel will be located on site in the contractor's compound and wastewater effluent from these facilities shall tanked offsite and disposed of at a suitable location. This will be confirmed in the contractor's Construction Management Plan once complete.

During construction, all new sewers shall be pressure tested and CCTV surveyed in accordance with the Uisce Éireann Standards to identify potential defects. Should they arise, shall be repaired prior to the connection.

Water Supply

During Construction, the watermains shall be tested in accordance with the requirements of Uisce Éireann prior to connection.

The proposed watermain infrastructure is designed in accordance with Irish Water's 'Code of Practice for Water Infrastructure IW-CDS-5020-03 and provides appropriate capacity for the development to minimise the risk associated with low service pressure.

Electricity

The ESB shall install all of the new incoming supplies to the proposed development. The ESB shall also liaise with the HSE and local residents and keep them fully informed of any brief outages which may be required due to the diversion of any cables.

The Contractor shall ensure that construction works on site adhere to the ESB Networks / HSA "Code of Practice for Avoiding Danger from Underground Services". If works do require an outage these shall be planned by the Contractor in advance and the ESB shall liaise with customers advising them of the same.

This is a positive, short-term and brief effect.

Telecommunications

The relevant utility provider shall install the new incoming supplies to the proposed development and shall liaise with the HSE to advise of possible outages in order to facilitate the connections. The works shall be carried out such that they minimize disruption to surrounding areas.

Gas

There is no gas infrastructure on the subject site and it is not proposed to provide gas as a utility within the proposed development. Therefore, it is considered the impact of the proposed development on the existing gas network is neutral, imperceptible and permanent.

Operational Phase

Surface Water

Surface Water runoff from the proposed development will be managed in accordance with the requirements of the Greater Dublin Strategic Drainage Study (GDSDS), with surface water attenuation and retention included as part of the main surface water drainage system. The surface water management proposals shall serve to significantly reduce the overall impact of the proposed development on the existing environment and shall reduce the risk of flooding in the receiving public surface water network. The features to be maintained include the Retention basins, Bioretention Areas, Tree pits, attenuation tanks, sumps in manholes, flow control device and permeable paving,

Wastewater Drainage

Irish Water shall implement an operational inspection and maintenance regime to ensure the system keeps operating within the design specifications.

This is a positive, significant and long-term effect.

Water Supply

The Proposed water supply system shall be commissioned and subject to a, as a minimum, monthly operational inspection and maintenance regime to ensure that the system keeps operating within the design specifications.

This is a positive, significant and long-term effect.

Electricity

The proposed electricity supply system shall be commissioned and subject to a regular operational inspection and maintenance regime, in accordance with the Utility providers procedures, to ensure the system keeps operating within the design specifications.

This is a positive, moderate and long-term effect.

Telecommunications

The proposed telecommunications system shall be commissioned and subject to a regular operational inspection and maintenance regime, in accordance with the Utility providers procedures, to ensure the system keeps operating within the design specifications.

This is a positive, moderate and long-term effect.

Gas

There is no gas infrastructure on the subject site and it is not proposed to provide gas as a utility within the proposed development. Therefore, it is considered the impact of the proposed development on the existing gas network is neutral, imperceptible and permanent.

14.8 Predicted Impacts

Construction Phase

Surface Water Drainage

surface water from the existing site shall continue to flow generally south / southeast towards the existing Avoca marsh. There are also existing dry drainage ditches to which surface water discharges. This is a neutral, imperceptible and temporary effect.

Wastewater Drainage

Temporary dewatering measures will be necessary to manage water within excavations. Water collected in temporary excavations shall be pumped to tanks on site and treated before discharge to the public wastewater network at a flow rate and location subject to the discharge license from Uisce Eireann.

The Contractor's welfare facilities for construction personnel will be located on site in the contractor's compound and temporary wastewater effluent from these facilities shall be discharged to the sewerage system at a location and at a flow rate subject to the conditions of a discharge license from Uisce Eireann. Details of the wastewater effluent disposal shall be confirmed prior to the commencement of construction as part of the contractor's construction management plan

This is a neutral, imperceptible and temporary effect.

Water Supply

During the Demolition and Construction phase, the Contractor shall install temporary facilities on site for construction personnel. The water demands during the Demolition and Construction Phase arising from the Contractors

Welfare facilities on the existing water supply networks are considered to have a neutral and imperceptible effect with a short-term duration.

Electricity

Electricity will be required for the construction activities for temporary lighting, equipment use etc. It is anticipated that a temporary connection will be taken from the existing LV supply which will facilitate electricity supply to the site during construction, subject to the appropriate agreements. The power demands during the construction phase on the existing electricity network are considered to be imperceptible, neutral and have a short-term effect.

Where the excavation strategy or temporary works require any temporary diversion of services or utilities on the site perimeter, this would be undertaken with prior agreement of the relevant service provider.

A negative, moderate, short-term effect is identified where utility diversions are required.

Telecommunications

There are no existing telecommunications infrastructure within the subject site of the proposed development and all existing telecommunication cables in adjacent developments in close proximity to the subject site are located in underground ducts within the adjacent roads. As such, there will be no likely significant effects on telecommunications infrastructure during the demolition and construction phase of the proposed development.

Where the excavation strategy or temporary works require any temporary diversion of local telecommunication services or utilities on the site perimeter, this would be undertaken with prior agreement of the relevant service provider.

These works are considered as neutral, imperceptible and with a short- term duration

Gas

There is no gas infrastructure on the subject site and it is not proposed to provide gas as a utility within the proposed development. Where the excavation strategy or temporary works require any temporary diversion of local gas services on the site perimeter, this would be undertaken with prior agreement of the relevant service provider. These works are considered as neutral with an imperceptible effect and with a short-term duration.

Operational Phase

Surface Water Drainage

The provision of a Sustainable Urban Drainage System (SuDS) for the proposed development will ultimately limit Surface Water run-off to 173.91 l/s from the existing subject site which is the allowable green-field run-off rate.

This is a neutral, imperceptible and permanent effect.

Wastewater Drainage

Wastewater flows from the proposed development will be conveyed south east to the upgraded PWSA Wastewater network; delivered by others, which will ultimately discharge to the upgraded Arklow

WWTP. Therefore, the proposed 7-year permission provides adequate time for this infrastructure to be completed in advance of construction of the 666 No. residential units.

This is a neutral, significant and permanent effect.

Water Supply

It is considered that the residual effects on the proposed watermain network, additionally with the upgraded infrastructure which forms part of the Uisce Eireann CDS Confirmation of Feasibility will be positive, significant and permanent.

Electricity

The proposed development will increase the demand on the electricity supply system. However, it is expected that infrastructural requirements for future development will be accommodated by ESB Networks.

This is a neutral, moderate and long-term effect.

Telecommunications

The proposed development will increase the demand on the telecommunications systems. However, it is expected that infrastructural requirements for future development will be accommodated by utility service providers.

This is a neutral, moderate and long-term effect.

Gas

There is no gas infrastructure on the subject site and it is not proposed to provide gas as a utility within the proposed development. Therefore, it is considered the impact of the proposed development on the existing gas network is neutral, imperceptible and permanent.

14.9 'Do Nothing' Scenario

If the proposed development were not undertaken, it is expected that there would be no change on the subject site on Surface Water drainage, wastewater drainage, Water Supply and other utilities arising from the subject site. The land is zoned for development and it is likely that in the absence of this subject proposal that a development of a similar nature would be progressed on the subject site that accords with National policy for compact growth on greenfield sites.

Surface Water Drainage

In the absence of the proposed development, Surface Water runoff from the subject site would continue to flow overland towards the existing dry ditches and Avoca marsh to the south or soak into the existing ground which is a neutral, imperceptible, long-term effect.

Wastewater Drainage

In the absence of the proposed development, there would be no increase in wastewater flows in the existing wastewater network which is a neutral, imperceptible, long-term effect.

Water Supply

In the absence of the proposed development, there would be no increase in water demand to the existing Water Supply network which is a neutral, imperceptible, long-term effect.

Electricity

In the absence of the proposed development, there would be no increase in Electricity demand to the existing network which is a neutral, imperceptible, long-term effect.

Telecoms

In the absence of this proposed development, there would be no change to the existing telecommunications network which is a neutral, imperceptible, long-term effect.

Gas

In the absence of this proposed development, there would be no change to the existing gas supply network which is a neutral, imperceptible, long-term effect.

14.10 Worst Case Scenario

Surface Water Drainage

The 'worst-case' scenario is that flooding occurs on-site and in the surrounding area due to this development. The design of the new drainage system ensures that the pipe sizes, gradients etc. will be adequate for the 1 in 100 yr storm event plus 20% Climate Change + 10% Urban Creep.

Wastewater Drainage

The 'worst-case' scenario resulting from the construction of the development would result in the contamination of groundwater and the adjacent watercourses/ Marsh by Wastewater effluent from the development. However, the mitigation measures outlined are standard and proven to ensure that this is not likely to occur.

Water Supply

The 'worst-case' scenario would be the pollution of the Water Supply by an accidental spillage or contamination during the connection process. However, the mitigation measures proposed are standard and proven to ensure that this will not occur. Prior to connection to the public watermain, all watermains in the development will be tested and cleaned to the requirements of Uisce Éireann.

Electricity

The 'worst-case' scenario would be the striking of the existing overhead power lines which traverse the subject site which would be fatal and lead to an unplanned power outage. The Contractor shall liaise at all times with the ESB and adhere to the ESB/ HSA "Code of Practice for Avoiding Danger from Overhead Electricity Lines to mitigate against this.

Telecommunications

The 'worst-case' scenario would be striking the existing telecommunications infrastructure during excavating works and causing an unplanned outage of service to customers. The Contractor shall ensure that all of the work will be carried out by authorised personnel who have expertise in the required works. This will minimise disruption to surrounding areas.

Gas

The 'worst-case' scenario would be striking the existing gas infrastructure during excavating works and causing an unplanned outage of service to customers. The Contractor shall ensure that all of the work will be carried out by authorised personnel who have expertise in the required works. This will minimise disruption to surrounding areas.

14.11 Monitoring & Reinstatement

Construction Stage Monitoring

Surface Water Drainage

During the construction of the Surface Water drainage, the system shall be inspected and monitored for compliance with the design and relevant Wicklow Co. Co. and GDSDS standards in accordance with the Preliminary Inspection Plan. The requisite air and pressure testing shall be carried out on all sewer installations during construction while exfiltration testing shall be carried out on all manholes. Records of these tests shall be maintained by the Contractor. The connection to the existing watercourses/ discharge locations will not be made until all the works are complete within each Phase and temporary surface water management will remain in place until this time to ensure only clean uncontaminated surface water is discharged discharge locations and ultimately, the Marsh to the south.

As a minimum, monthly inspections to ensure that it operates in accordance with the design specification. The features to be maintained include the retention basins, bio-retention areas, tree pits, attenuation tanks, sumps in manholes, flow control device and permeable paving.

Wastewater Drainage

During the construction of the Wastewater drainage, the system shall be inspected, tested and monitored in accordance with the requirements of the relevant Irish Uisce Eireann Code of Practice. Records of these tests shall be maintained by the Contractor as required and shall be witnessed by Irish Water in accordance with the relevant Quality Procedures. The connection to the upgraded Wastewater network as part of the PWSA works by others will not be made until all the works are complete within each phase and temporary Wastewater management associated with the Contractor's compound will remain in place until this time.

Water Supply

During the construction of the Water Supply, the system shall be inspected, tested and monitored in accordance with the requirements of the relevant Uisce Eireann Code of Practice. Records of these tests shall be maintained by the Contractor as required and shall be witnessed by Irish Water in accordance with the relevant Quality Procedures. The connection to the upgraded network will not be made until all the works are complete within each Phase and temporary water connection associated with the Contractor's compound will remain in place until this time.

Electricity

The ESB shall monitor the existing and proposed networks during the diversion and undergrounding of the existing over-head powerlines. The ESB shall carry out ongoing testing and commissioning of the installed infrastructure during construction.

Telecommunications

The incoming telecommunications provider shall monitor the existing and proposed networks during the installation of the proposed telecommunications network throughout the site during construction. The incoming telecommunications provider shall carry out ongoing testing and commissioning of the installed infrastructure during construction.

Gas

There is no gas infrastructure on the subject site and it is not proposed to provide gas as a utility within the proposed development. Therefore, monitoring of this utility is not required.

Operational Stage Monitoring

Surface Water Drainage

Following construction of the proposed Surface Water drainage network, pressure tests shall be carried out to assess the potential for leaks to occur in the newly laid sewers. In addition, the Contractor shall carry out periodic testing of the Surface Water discharge to ensure compliance in accordance with the requirements of the Wicklow County Council Water Services Department (WCC WSD). Following completion of the proposed drainage systems, a short-term flow and rainfall survey including the use of flow monitors and rain gauges shall be carried out to identify misconnections and allow for comparison with watermain meter readings to facilitate assessment and identification of any potential leakages. Following commissioning of the proposed Surface Water network, the local authority shall implement a maintenance regime, as a minimum, monthly inspections to ensure that it operates in accordance with the design specification. The features to be maintained include the piped Surface Water network and all SuDS features. The features to be maintained include the retention basins, bio-retention areas, tree pits, attenuation tanks, sumps in manholes, flow control device and permeable paving.

Wastewater Drainage

Following construction of the proposed Wastewater drainage network, pressure tests shall be carried out in accordance with the Irish Water Standards to assess the potential for leaks to occur in the newly

laid sewers. Following completion of the proposed drainage systems, a short-term flow and rainfall survey including the use of flow monitors and rain gauges shall be carried out to identify misconnections and allow for comparison with watermain meter readings to facilitate assessment and identification of any potential leakages.

Water Supply

Following construction of the prosed watermain infrastructure, pressure tests will be carried out in accordance with the Irish Water Standards to assess the potential for leaks to occur in the newly laid watermains. The proposed watermain system will incorporate water meters at all points of connection to the public watermain network which facilitates ongoing monitoring of demand and assessment for potential leakage.

Electricity

ESB shall test and commission all of the work they carry out and shall monitor and maintain each of the ESB sub-stations and network cabling post installation. All supplies shall be metered to allow the new loads on the network to be monitored in use.

Telecommunications

The providers of incoming telecommunications supplies will test and commission all of their cabling/ work and will monitor and maintain their network cabling post installation.

Gas

There is no gas infrastructure on the subject site and it is not proposed to provide gas as a utility within the proposed development. Therefore, monitoring of this utility is not required.

14.12 Difficulties in Compiling Information

There were no difficulties in compiling the information.

14.13 References

- The Greater Dublin Region Code of Practice for Drainage Works, 2012, Fingal County Council, Dublin City Council, Dún Laoghaire-Rathdown County Council, South Dublin County Council, Wicklow County Council, Kildare County Council, Meath County Council
- Greater Dublin Strategic Drainage Study, 2005, Fingal County Council, Dublin City Council, Dún Laoghaire-Rathdown County Council, South Dublin County Council, Wicklow County Council, Kildare County Council, Meath County Council
- I.S. EN752: 2017 Drain & Sewer Systems outside Buildings, 2017, National Standards Authority of Ireland
- I.S. EN12056: 2000 Gravity Drainage Systems inside Buildings, 2000, National Standards Authority of Ireland

- I.S. EN752: 2017 Drain & Sewer Systems outside Buildings, 2017, National Standards Authority of Ireland
- Code of Practice for Water Infrastructure, 2017, Uisce Éireann
- Code of Practice for Wastewater Infrastructure, 2017, Uisce Éireann
- Wastewater Treatment Manuals, 1999, Environmental Protection Agency
- Control of Water Pollution from Construction Sites, 2001, Construction Industry Research and Information Association
- Technical Guidance Document H Drainage & Wastewater Disposal, 2016, Department of Housing, Planning, Community and Local Government
- The SuDS Manual, 2015, Construction Industry Research and Information Association
- 2432-DOB-XX-SI-RP-C-0001, Donnachadh O'Brien & Associates Consulting Engineers
- 2432-DOB-XX-SI-RP-C-0004, Donnachadh O'Brien & Associates Consulting Engineers

15. Interactions

15.1 Introduction

As a requirement of the Planning and Development Regulations 2001 -2024, and the EPA Guidelines (2022), not only are the individual significant impacts required to be considered when assessing the impact of a development on the environment, but so must the interrelationships between these factors be identified and assessed.

Under the Regulations interactions between the various environmental factors, are to be assessed as well as the vulnerability of the proposed development to the risk of natural disaster.

15.2 Assessment

Where an interaction is likely, it is given a reference number in the matrix and detail of the interaction is recorded below. The significance, quality – whether it is positive, negative or neutral – and the duration of the interaction is assessed. The interactions are listed in numerical sequence, purely for referencing purposes. Each of these interactions have been addressed in the relevant EIAR chapters.

	Population	Biodiversity	Soil	Hydrology	Noise	Air and Climate	Landscape	Traffic	Waste	Cultural Heritage	Material Assets
Population											
Biodiversity											
Soil	1	10									
Hydrology	2	11	16								
Noise	3	12									
Air and Climate	4	13	17								
Landscape	5	14	18								
Traffic	6										
Waste	7										
Cultural Heritage	8										
Material Assets	9	15									

Table 15.1: Table of interactions (Below Table)

1. Population & Human Health / Soils

There is potential for dust generation during construction works, which under dry and windy conditions could lead to localised dust impacts for the small number of properties proximate to the development site. However, the implementation of dust management and dust control measures as highlighted within the dust minimisation plan in Appendix 9.2 will ensure that the proposed development will not give rise to the generation of any significant quantities of dust. As a result, the impact will be **temporary, imperceptible and neutral/ negative**.

2. Population & Human Health / Hydrology

Failure or mismanagement of the potable water supply could lead to its contamination during the construction phase. A range of mitigation measures, as outlined in Chapter 7, will be put in place during the construction phase of the development to ensure this does not occur. The correct implementation of these mitigation measures will ensure that the potential impacts on hydrology and water services during the construction phase will be **imperceptible and short term**.

3. Population & Human Health / Noise

Increased noise levels during the construction phase will be temporary and are not expected to have a long-term significant adverse effect upon the local population. The application of binding noise limits, hours of operation, along with implementation of the mitigation measures, as identified in Chapter 8 and the CEMP, will ensure that noise and vibration impact will have a **negative, moderate, and short-term** impact on the surrounding environment.

The impact due to the increased traffic associated with the operational development is expected to be **neutral, imperceptible, and long-term.**

4. Population & Human Health / Air

The completed development will generate additional emissions to the atmosphere due to traffic associated with the development. However, air quality in the vicinity of the site is expected to remain within air quality standards, and the impact is expected to be **imperceptible**.

During construction, there may be potential for slight dust nuisance in the immediate vicinity of the site. However, dust control measures, such as wheel washes, covering of fine material etc. will minimise the impacts on air quality. As a result, the impact will be **temporary, imperceptible and neutral/ negative.**

5. Population & Human Health / Landscape

Existing residents and visitors to the Kilbride area interact with the landscape, such that they will be aware of a significant change at this site from a vacant greenfield site to a new residential development with a mix of unit types, building heights, open spaces etc.

The landscaping proposals set out in this scheme will bring positive benefits in terms of recreational amenity provision including the amenity value of the proposed Boardwalk and the opening up of access to the Boardwalk as proposed as part of this development which will contribute to public open space provision available to the people of Arklow. This will bring **positive, significant impacts** in terms of local recreation amenity and provision.

6. Population & Human Health / Traffic

Chapter 11 notes that, provided the mitigation measures and management procedures outlined in the Construction Environmental Management Plan are incorporated during the Construction Phase, the residual impact upon the local receiving environment is predicted to be **slight to moderate** in the nature and **short-term.**

Once complete, the proposed development will operate well within capacity during the AM and PM peak hours in the 2026 + Proposed Development (Opening Year) scenario and would continue to do so for the future assessments.

The pedestrian and cyclist infrastructure proposed will greatly enhance connectivity of surrounding neighbourhoods to Arklow town via the Boardwalk as proposed as part of this development which will result in a **positive, significant impact**. Positive impacts on population and human health will include health benefits associated with the provision of a significant quantity of open space, as well as the provision of walking and cycling facilities.

7. Population & Human Health / Waste

As noted in Chapter 12, a carefully planned approach to waste management as set out in the mitigation measure, and adherence to the Resource Waste Management Plan (which include mitigation) during the construction phase will ensure that the effect on the environment will be **short-term, imperceptible and neutral.**

During the operational phase, a structured approach to waste management as set out in Chapter 12 and adherence to the OWRMP (which include mitigation) will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented, and a high rate of reuse, recycling and recovery is achieved, the predicted effect of the operational phase on the environment will be **long-term, imperceptible and neutral.**

8. Population & Human Health / Archaeological, Architectural & Cultural Heritage

Groundworks across the whole of the Phase 1 Kilbride lands will directly impact sub-surface archaeological remains that may be exposed during monitoring of topsoil stripping or other required groundworks at the construction phase. Pre-construction archaeological mitigation may not be practicable in the Town Marsh due to wet ground conditions or natural heritage constraints, and mitigation will need to be addressed during the construction phase.

During the operation phase, the development will directly impact the rural and visual setting of Kilbride Graveyard and the pyramidal Howard Mausoleum sited in Kilbride Graveyard. The establishment of a sufficiently sized green buffer to maintain the graveyard and Howard Mausoleum's visual dominance in the landscape, the sites elevation above proposed development heights, and open views southwards and south-eastwards will reduce the severity of the impact. The predicted effect of the operational phase on the cultural heritage will be **long-term and insignificant.**

9. Population & Human Health / Materials Assets

There is the potential for contamination of potable water supply, gas leaks or explosions, loss of supply of services. With the implementation of the mitigation measures in Chapter 14 the impact of the proposed built services on human health is likely to be **imperceptible**.

10. Biodiversity / Soils

With the protective measures noted in Chapter 5 in place during Construction Phase and for excavation works, any potential impacts on soils and geology at the Site and surrounding area will be

avoided and there will be **no significant adverse impacts** on the land, soils and geology of the subject lands are envisaged. There are no predicted significant adverse impacts are predicted on land, soils or geology associated with the Operational Phase of the Proposed Development.

11. Biodiversity / Hydrology

Based on the successful implementation of the construction phase controls and the works to be carried out in accordance with this EIAR, it is likely that there will be no significant ecological impact arising from construction works proposed for the proposed project. Natura 2000 sites will not be impacted by the proposed development during construction.

A series of standard construction phase control measures have been outlined to ensure that the proposed project does not impact on species or habitats of conservation importance, conservation areas or watercourses during construction. It is essential that these measures are complied with to ensure that the proposed works do not have downstream environmental impacts. These measures are to protect the Arklow Town Marsh pNHA, Avoca River and a tributary of the Avoca River along the southeastern boundary of the site, which are potentially the primary vector of impacts from the site, are not impacted during construction and operational phases of the proposed development.

No significant environmental impacts are likely in relation to the construction of the proposed development. Effects: **moderate effects / National / Negative effect / Not significant /short term/likely.** Standard mitigation will be in place on site.

Standard operational phase control measures have been outlined to ensure that the proposed project does not impact on species or habitats of conservation importance, conservation areas or watercourses. It is essential that these measures are complied with, to ensure that the proposed works do not have downstream environmental impacts. These measures are to protect the Arklow Town Marsh and Avoca River, which are potentially the primary vector of impacts from the site, is not impacted during operational phases of the proposed development. Light spill will be introduced into the area but these have been designed to have minimal impact on biodiversity. It would be expected that there would be no significant long term impact on the reedbed based on the mitigation and it would be expected that the reed bed in the vicinity of the bog matting would recover within 3 years. The operation of the boardwalk would not have a long term impact on the Arklow Marsh pNHA.
No significant environmental impacts are likely in relation to the operation of the proposed development.
Effects: **Slight effects / site / Negative effect / Not significant / long term/likely.** Standard mitigation will be in place on site.

12. Biodiversity / Noise

During the construction phase, noise may be generated due to increased vehicle movements and the operation of construction plant. It is anticipated that there would be a moderate impact, for a limited period of time, on any fauna within the vicinity of the development. Control and mitigation measures would be implemented to reduce noise, including measures relating to equipment operation and maintenance and timing of activities. Given the transient nature of construction works, and provided mitigation measures are implemented, noise from construction would not be considered to pose a significant impact upon fauna.

During the operational phase noise would be typical of an urban residential development. There would be would no significant impact on fauna within the vicinity of the proposed development.

13. Biodiversity / Air

An adverse impact on air quality has the potential to cause dust nuisance and cause disturbance to fauna. The risk to air quality as a result of the proposed development would not be considered significant, both at the local community level and on a broader national / global scale. Air emissions would be typical of residential buildings, being primarily from heating and therefore low impact in-and-of-itself. In-combination residential impacts would be controlled by national energy policies and grant schemes. While there would be increased dust emissions during the construction phase, these would not be considered to pose a significant risk owing to the transient nature of construction works and the construction timeframe.

During the construction phase of the development, there would be potential for dust emissions, which could impact upon flora and fauna in the surrounding area. The potential impact of dust would be temporary, given the transient nature of construction works. Dust control would be an integral part of construction management practices, with mitigation measures implemented where required, including sweeping of roads and hardstand areas, appropriate storage and transport of material and dust suppression measures where required.

14. Biodiversity / Landscape

No negative significant impacts on habitats are anticipated during the Operational Phase of the Proposed Development. Pollinator-friendly native wildflower, ornamental, and tree planting is proposed, with the tree species selected to maximise resources for wildlife, particularly forage for birds and invertebrates. Light spill will be introduced into the area but these have been designed to have minimal impact on biodiversity.

15. Biodiversity / Material Assets

The proposed development would alter flora cover and the species of fauna supported due to land take and soil disturbance works. This impact would be minor due to the low ecological value of the habitats present at the proposed development. The habitats of note at the development site are hedgerows and treelines with the majority of hedgerows to be maintained and trees removed will be replanted. The landscape plan includes areas that are less intensively managed such as meadows that will provide a more diverse range of habitats within the proposed development.

16. Soils / Hydrology

The predicted impacts of the construction phase are described in Table 6.3 of Chapter 6 in terms of quality, significance, extent, probability and duration. The relevant mitigation measures are detailed and the residual impacts are determined which take account of the mitigation measures.

After the implementation of the mitigation measures outlined below, the proposed development will not give rise to any significant long-term adverse impact. Negative impacts during the construction phase will not be significant once the appropriate mitigation measures are adopted and will be only **short term** in duration.

During the Operational Phase of the Project there is a **neutral, permanent, imperceptible impact** on the local and regional geological environment

17. Soils / Air

Exposed soil during the construction phase of the proposed scheme will give rise to increased dust emissions. Chapter 9 notes that when the dust minimisation measures, as outlined in Chapter 9, are implemented, fugitive emissions of dust from the site will be neutral effects that are **imperceptible**, within normal bounds of variation or within the margin of forecasting error.

18. Soils/Landscape

Residual soils arising as a result of excavation at the development site will be used in landscaping works in the proposed public open spaces as much as possible rather than transporting off-site. This impact will be **imperceptible and long-term**.

16. Schedule of Mitigation Measures

16.1 Introduction

Given the complexity of the proposed development and this EIAR, this chapter seeks to provide a complete summary of mitigation measures proposed in Chapters 4 to 16. The appointed contractor will be required to adhere to the mitigation contained in the EIAR. Monitoring of the effectiveness of mitigation measures put forward in the EIAR document by the competent authorities is also integral to the process.

16.2 Construction Phase

Population and Human Health	A Construction and Environmental Management Plan (CEMP) has been prepared by Altemar Ltd and will be implemented during the construction phase to reduce the detrimental effects of the construction on the environment and local population and is submitted with this application. Construction noise and vibration impacts are expected to vary during the construction/ site clearance phase depending on the distance between the activities and noise sensitive buildings and that best practice control measures will ensure impacts at off-site noise sensitive locations are minimised. These are outlined in detail in Chapter 8. Chapter 11 Traffic and Transportation and the CEMP submitted with the application include traffic management measures to minimise the impact of construction traffic. These measures are put forward to avoid any significant negative environmental impacts on the population and human health. No additional mitigation measures are considered necessary.
Biodiversity	• A pre-construction survey for bats and terrestrial mammals will be carried out. This will include an inspection for resting and breeding places for both terrestrial mammals and bats. Should resting or breeding places be found a derogation licence will be acquired from NPWS and conditions followed prior to works commencing in the vicinity of the resting or breeding place. • An Ecological Clerk of Works (ECoW) will be appointed to oversee the construction phase and to oversee the implementation of all mitigation including compliance with Wildlife Acts and Water Pollution Acts and ensure that biodiversity in neighbouring areas including birds will not be impacted. • Relevant guidelines and legislation (Section 40 of the Wildlife Acts, 1976 to 2012) in relation to the removal of trees and timing of nesting birds will be followed e.g. do not remove trees or shrubs during the nesting season (1st March to 31st August). If removal is required during this season the removal of woody material will be carried out under the supervision of an ecologist. If nesting birds are present NPWS will be contacted, and removal will be subject to conditions outlined by NPWS. A pre-construction survey for reed warbler and sedge warbler will be carried out along the proposed boardwalk route if carried out within bird nesting season.

	• Lighting during construction will be carried out in consultation with the project ecologist and treelines or wooded areas will not be lit. Consultation with the project ecologist will be carried out in relation to lighting and the development of an initial prototype to minimise light spill from the boardwalk. This would include the optimal angle of the lighting within the rail and mesh design to limit side spill. • It would be expected that the beneficial effects of these trees would not be seen until the medium to long term. • Removal of deciduous trees. Should any mature broadleaved tree be scheduled for removal as part of the development plans, it will first be surveyed for roosting potential and bat presence if required. If bats are found, an application for a derogation licence should be made to the National Parks and Wildlife Service to allow its legal removal. Such trees will be felled in the period late August to late October, or early November, in order to avoid disturbance of any roosting bats as per National Roads Authority guidelines (NRA 2006a and 2006b) and also to avoid the bird breeding seasons. Any tree felling will be completed by mid-November at the latest as bats roosting in trees are very vulnerable to disturbance during their hibernation period (November – April). Trees may be removed at other times but the likelihood of encountering bats during works will be higher. Trees with ivy-cover, once felled, will be left intact onsite for 24 hours prior to disposal to allow any bats beneath foliage to escape overnight. • Trees to be retained. Where possible, treelines and mature trees that are located immediately adjacent to planned construction areas or are not directly impacted will be avoided and retained intact. Retained trees will be protected from root damage by machinery by an exclusion zone of at least 5 metres or equivalent to canopy height. Such protected trees will be fenced off by adequate temporary fencing prior to other works commencing. • Lighting restrictions. In general, artificial light creates a barrier to bats so lighting will be avoided where possible. Where lighting is required, directional lighting (i.e. lighting which only shines on work areas and not nearby countryside) will be used to prevent overspill during construction. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvers and shields to direct the light to the intended area only. • Lighting will be centred on the boardwalk to minimise light spill on either side into the marsh. • 50 bird boxes and 18 bat boxes will be placed on site as an enhancement measure. Of these ten bird boxes and 12will be placed on the board walk. The position of these boxes will be carried out in consultation with an ecologist. • Pre-construction survey for breeding reed warbler (Acrocephalus scirpaceus) will be carried out along the proposed boardwalk route if bog matting is to be placed during bird nesting season.
Land, Soil and Geology	The following sections describe the mitigation measures which shall be adopted as part of the construction works on site to reduce the potential impacts on the soils, geology environment. Control of Excavations and Export of Material Arising from the Site

	The proposed works shall incorporate, as identified in the Construction Environmental Management Plan submitted with this LRD Application submission, the reduce, reuse and recycle approach in relation to the excavation of soil on site. All excavation arisings shall be, where possible, reused on site. Stockpiles have the potential to cause negative impacts on air and water quality; therefore, the effects of soil stripping and stockpiling shall be mitigated through the implementation of an appropriate earthworks handling protocol implemented by the Contractor during the Construction Phases. Stockpiles shall be formed within the boundary of the excavation zone and there shall be no direct link or pathway from this zone to any surface water body. Only local/low level of stockpiling shall occur as the bulk of the material to be excavated shall be paced directly into haulage vehicles for transport off site to an appropriately licensed facility or, where possible, will be reused in other areas of the site as fill. The Contractor shall implement dust suppression measures, vehicle wheel washes, road sweeping and general housekeeping to ensure that the surrounding environment is free of nuisance dirt and dust dirt on roads. Export of Material Arising from Site Where demolition and construction material, such as excavated material, cannot be reused on site it shall be transported for recovery/disposal at an appropriately licenced facility as outlined in the Construction Environmental Management Plan. Following the geo-environmental sampling and associated laboratory testing, the waste classification completed on the soils has found that all results indicate that the materials are free from asbestos and are classified as a non-hazardous soil waste suitable for disposal at an inert landfill facility. Additional Soil Classification shall be carried out as part of the Construction Phases and waste shall be delivered by the Contractor to licensed Waste facilities which are authorised under the Waste Management Act 1996, as amended, and which hold the appropriate certificate of registration, Waste facility permits or EPA licence. Control of Water During the Construction Phases The Contractor shall carry out the earthwork and excavation activities such that surfaces, as they are being raised, shall be designed with adequate drainage, falls and profile to control run-off and prevent ponding and flowing silts. The Contractor shall exercise care to ensure that exposed soil surfaces are stable in order to minimise erosion and that all exposed soil surfaces shall be within the main excavation site thus limiting the potential for any offsite impacts. All surface water run-off shall be prevented from directly entering into any water courses whatsoever in accordance with the Construction Environmental Management Plan. During the excavation of the existing site for the pond structures and foundation excavations, surface water shall pond in the excavations. The Contractor shall implement pre-treatment and silt reduction measures on site and shall include a combination of silt fencing, settlement measures (silt traps, silt sacks and settlement tanks) and

	hydrocarbon interceptors (as outlined in the Construction Environmental Management Plan). Qualitative and quantitative monitoring shall be implemented, with the client's Environmental Consultant auditing the Contractor's regular sampling and analysis results. Sources of Fill Material / Aggregates for the Site The Contractor shall source all imported fill and aggregate for the Project from reputable suppliers and shall ensure the following • Aggregate Declarations of Performance for the classes of material specified, • Environmental Management status and the Regulatory and Legal Compliance status of the proposed suppliers. The Contractor may consider recycled or recovered materials as aggregates for the Project where appropriate. Fuel and other Hazardous Substance Handling, Transport and Storage The Contractor shall implement the following mitigation measures on site in order to prevent any spillages to ground of fuels and prevent any resulting soil and/or groundwater quality impacts: • Dedicated bunded refuelling areas, • Provision of spill kits for hazardous substances, Diesel/ petrol powered equipment to be placed on suitable drip trays.
Hydrology and Hydrogeology	*General Measures to Safeguard Water Quality* The management of surface water during the construction phase will adhere to the recommendations of the CIRIA guides Control of Water Pollution from Construction Sites (2001) and Control of Water Pollution from Linear Construction Projects (2006). Pollution Risk During construction key requirements for control of chemical pollution risk will include: • Storage – all equipment, materials and chemicals will be stored in the compound for the housing construction. Chemical, fuel and oil stores will be sited on impervious bases in the site compound and within a secured bund of 110% of the storage capacity, within the lay down area. • The integrity and water tightness of all the bunding structures and their resistance to penetration by water or other materials stored therein shall also be tested and demonstrated. • All fuel oil fill areas will have an appropriate spill apron. • Vehicles and refuelling – standing machinery will have drip trays placed underneath to prevent oil and fuel leaks causing pollution. Where practicable, refuelling of vehicles and machinery will be carried out on an impermeable surface in designated areas, well away from any surface watercourse. • Maintenance – maintenance to construction plant will not be permitted on site unless vehicles have broken down necessitating maintenance at the point of breakdown. All necessary pollution

prevention measures will be put in place prior to commencement of maintenance in this instance.

- Mess, sanitation and welfare facilities will be required during construction and will be located at the construction compound. Foul effluent will make use of chemical facilities with periodic removal for offsite disposal.

No significant excavation works are foreseen. However, in the event that minor excavations are required, soil material excavated will be transferred directly to a dumper truck. The excavated material will be stored temporarily within the main temporary site compound.

Water Management

As mentioned above, water levels across the marsh are shallow and respond directly to rainfall, rising above ground level after rainfall events and are therefore sensitive to potential leakage due to construction works.

Because of this, it is proposed to establish a weather-based precautionary system for allowance to construction works on the marsh; construction works will be carried out during Spring-Autum period. Machinery works (such as drilling/piling) shall not be permitted on the marsh in the event of a heavy rainfall event. Heavy machinery works will be scheduled on a regular basis subject predicted dry conditions ahead. A cut-off point and a black/white system will be established at the entrance of the work area on the marsh to allow work to proceed.

In the event of expected heavy rainfall, all heavy machinery will be removed in advance from the marsh area and stored on the compound site. Works will only be resumed after approval of Ecological Clerk of Works (ECoW).

Extensive monitoring will be adopted to ensure that the water is of sufficient quality to discharge to the vegetated ground on the marsh. The use of additional settlement and silt traps and an oil interceptor (if required) will be adopted if the monitoring indicates the requirements for the same with no excess silt or contaminated water permitted to discharge to the marsh.

It is further noted that works will be completed between the months of April to October, during the time of year when precipitation is low and the risk of flooding is minimised.

Measures to Safeguard against the Release of Hydrocarbons

To control and contain any potential hydrocarbon and other harmful substances spillage by vehicles during construction, it is recommended where possible to refuel plant equipment off the development site, thus mitigating this potential impact by avoidance. However, given the remote nature of the Site, this is not likely to be a practical measure for all equipment.

If fuelling must occur on site, then a discrete "fuel station" will be designated for the purpose of safe fuel storage and fuel transfer to vehicles. This fuel station will be bunded to 110% volume capacity of fuels stored at the site and will be located within the site compound. The bunded area will be drained by an oil interceptor and drainage of same will be controlled by a pent stock valve that will be opened to discharge storm water from the bund. A suitably qualified management company will take responsibility for management and maintenance of the oil interceptor and associated drainage on a regular basis, including decommissioning following construction.

Despite the management of refuelling and fuel storage, there remains the risk of leakage from vehicles and plant equipment during construction activity. The plant equipment used on site will require regular mechanical checks and

audits to prevent spillage of hydrocarbons on the exposed ground (during construction).

In the event of an accidental spill during the construction, contamination occurrences will be addressed immediately, this includes the cessation of works in the area of the spillage until the issue is resolved. In this regard, spill kits will be kept in each vehicle associated with the Development i.e. spill kits will be readily available to all operators. Spill kits will contain a minimum of; oil absorbent granules, oil absorbent pads, oil absorbent booms, and heavy-duty refuse bags (for collection and appropriate disposal of contaminated matter). No materials contaminated or otherwise will be left on the Site. Spill kits will also be established at proposed construction areas, for example, a spill kit will be established and mobilised as part of the sheet piled area materials and equipment. Suitable receptacles for hydrocarbon contaminated materials will also be at hand.

Once the above measures are implemented the risk of hydrocarbon contamination intercepting the surface water network will be significantly reduced, however there remains a level of risk, and therefore both precautionary measures and emergency response protocols as specified in the CEMP will be implemented on site.

Measures to Safeguard against the Release of Cement-Based Products

The piles for the boardwalk will be filled with concrete and a single 25mm steel reinforcing bar. In-situ concrete will be placed with mini concrete trucks and concrete pumps will be utilised. This pouring of concrete will be located in the immediate vicinity of the marsh. The operation and management of these activities be carefully controlled to avoid spillage which will adversely affect the chemical water composition and aquatic habitats of species. As the use of concrete cannot be avoided the following control measures will be employed:

- Placing of concrete in or near watercourses will be carried out only under the supervision of the Ecological Clerk of Works (ECoW).
- No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place.
- Where possible, pre-cast elements for culverts and concrete works will be used.
- No washing out of any plant used in concrete transport or concreting operations will be allowed on-site.
- Where concrete is delivered on site, only the chute shall be cleaned, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any drain or watercourse will be allowed. Chute cleaning water is to be tanked and removed from the site to a suitable, non-polluting, discharge location.
- Use weather forecasting to plan dry days for pouring concrete.
- Ensure pour site is free of standing water, and plastic covers will be ready in case of sudden rainfall event.
- Disposal of raw or uncured waste concrete will be controlled to ensure that watercourses or other sensitive areas will not be impacted.

- No cement will be required for works associated with horizontal directional drilling under watercourses and no cement will be stored in the vicinity of watercourses during such works.

Measures to Safeguard against the Release of Other Pollutants

All precautions will be taken to avoid spillages of diesel, oil or other polluting substances during the construction phase. The Contractor is obliged to implement the following measures to prevent contamination of watercourses:

- No refuelling of construction vehicles or plant will take place within the 50m surface water buffer zone (i.e., away from the marsh).
- Undertaking refuelling of plant, equipment and vehicles will only be undertaken on impermeable surfaces.
- No maintenance of construction vehicles or plan will take place along the proposed boardwalk, except in a case of emergency.
- All potentially hazardous chemicals, fuel, hydraulic oils and lubricants will be stored in bunded areas (in accordance with established best practice guidelines) at the Site Compound.
- In order to reduce the risk of contamination arising as a result of spills or leakages, all fuels, chemicals, liquid and solid waste will be stored on impermeable surfaces.
- If there is a requirement to store hazardous chemicals on site, they will be stored within a bunded, locked COSHH container, with upkeep and security ensured by the contractor.
- All tanks and drums are to be bunded in accordance with established best practice guidelines.
- Re-fuelling of construction equipment and the addition of hydraulic oil or lubricants to vehicles / equipment will take place in designated bunded areas within the main construction compound and not on-site where reasonably practicable. If it is not possible to bring machinery to the refuelling point, fuel will be brought to site by a 4x4 in a double skinned bowser with drip trays. The bowser/4x4 will be fully stocked with spill kits and absorbent material, with delivery personnel being fully trained to deal with any accidental spills. The bowser will be bunded appropriately for the fuel usage volume for the time period of the construction.
- The plant and machinery used will be regularly inspected for leaksand fitness for purpose.
- Spill kits will be readily available to deal with accidental spillage at all times.
- A segregated waste storage will be available at the substation construction site.
- An inventory of all chemicals on site will be kept. It will include:
    - Procedures for storage of all materials listed
    - Location details of all materials listed
    - Volume and description of all substances stored on-site
    - Waste disposal records, including copies of all Waste Transfer Notes (WTN) detailing disposal routes and waste carriers used. Where waste is being shipped abroad, a copy of the Trans Frontier Shipping (TFS) document must be obtained from Dublin City Council and kept on site along with details of

	the final destination and any relevant permits, licences or other relevant documentation. ○ Chemical storage details will be part of routine site audits. ○ Only where absolutely necessary should any hazardous waste be stored on site. If so, Hazardous Waste should be stored in a COSHH store. Only trained operatives should handle hazardous substances. Please note that COSHH data sheets are NOT risk assessments and all risk assessment should be carried out separately. All stored hazardous waste will be clearly labelled. All of these will be regularly inspected for visual signs of leaks or something that would impact on their capacity – e.g. where a drip tray is full of rainwater. *Measures to Safeguard against the Release of Sewerage* A self-contained port-a-loo system with an integrated waste holding tank will be used on site for toilet facilities, which will be located in the construction compound for the housing. This will be maintained by the service contractor as required and will be removed from the site on completion of the construction phase. *Measures to Safeguard against Impacts during Piling Works* In order to avoid the potential for adverse impacts to instream and marsh and in-stream habitats during the construction phase the method of piling to be implemented will be based on non-invasive techniques, ensured by the use of bog mats and lighter vehicles. This coupled with the set-back distances of the pile locations from the Avoca river, as well as the presence of the bedrock and overburden between the river and the pile locations at piers and abutments, will ensure that no noise or vibration associated with the piling will have the potential to cause injury to the local species (i.e. will not exceed the low guide value of the 183 dB within adjacent waters) within the river channel adjacent to the piling locations. In addition, the timing of all piling works will be timed to occur outside the spawning season in the Avoca River. The use of non-invasive piling will also ensure that vibration levels associated with this piling will be low and will not present a risk of undermining the integrity of the marsh, Avoca riverbanksand their collapse. With the implementation of the above measures, it is concluded that the piling works during the construction phase will not result in adverse effects to Annex 2 fish species, or species dependant on the hydrological and hydrogeological local environment associated with Avoca River and the marsh.
Noise and Vibration	The vibration from construction/demolition activities including the boardwalk construction will be limited to the values set out in Tables 8.2 and 8.3 of Chapter 8. Magnitudes of vibration slightly greater than those in the table are normally unlikely to cause cosmetic damage, but construction work creating such magnitudes should proceed with caution. Limit values have been provided for soundly constructed residential and commercial properties. The best practice mitigation measures set out below: • Liaison with the public • Monitoring

	• Vibration Control at Source <u>Liaison with the Public</u> A designated environmental liaison officer will be appointed to site during construction works. Any vibration complaints will be logged and followed up in a prompt fashion by the liaison officer. In addition, where a particular vibration construction activity is planned or other works with the potential to generate high levels of vibration, or where vibration works are expected to operate outside of normal working hours etc., the liaison officer will inform the nearest noise sensitive locations of the time and expected duration of the vibration works. <u>Vibration Control at Source</u> If replacing a vibration item of plant is not a viable or practical option, consideration will be given to control "at source". This refers to the modification of an item of plant or the application of improved vibration reduction methods in consultation with the supplier. In order to effectively manage vibration at Arklow Castle ruin and Ormonde Cinema located to the east of the proposed site and on the proposed site, installation of continuous data logging live noise and vibration monitoring system is required. This software will require remote login, data download and text/email alert functionality. It will measure key vibration parameters (e.g.PPV(mm/sec)) and Frequencies as Hz.
Air and Climate	The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the dust management plan. The key aspects of controlling dust are listed below. Full details of the dust minimisation plan can be found in Appendix 9B. • The specification and circulation of a dust management plan for the site and the identification of persons responsible for managing dust control and any potential issues. • The development of a documented system for managing site practices with regard to dust control • The development of a means by which the performance of the dust management plan can be monitored and assessed. • The specification of effective measures to deal with any complaints received. At all times, the procedures within the plan will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations. The procedures to rectify the problems are set out in Appendix 9B (Dust Management Plan). Dust nuisance is defined when air quality standards relating to dust deposition and PM10 are exceeded. Where levels exceed specified air quality limit values, dust generating activities shall immediately cease and alternative working methods shall be implemented. In order to minimise dust emissions during construction, a series of mitigation measures have been prepared in the form of a Dust Management Plan (see

	appendix 9B). Provided the dust management measures outlined in the plan (see Appendix 9B) are adhered to, the air quality impacts during the construction phase will not be significant. Regard has also been taken for the import of infill materials from off-site locations and potential dust impacts as a result of this will also be mitigated. With the implementation of all mitigation measures they will be no impact on the Avoca River. Construction traffic and embodied energy of construction materials are expected to be the dominant source of greenhouse gas emissions as a result of the construction/demolition phase of the development. Construction vehicles, generators etc., may give rise to some CO2 and N2O emissions. However, due to short-term and temporary nature of these works, the impact on climate will not be significant. Nevertheless, some site-specific mitigation measures can be implemented during the construction/demolition phase of the proposed development to ensure emissions are reduced further. In particular the prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site. • Use of rubble chutes and receptor skips during construction activities. • During dry periods, dust emissions from heavily trafficked locations (on and off site) will be controlled by spraying surfaces with water and wetting agents. • Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un- surfaced roads will be restricted to essential site traffic only. • Re-suspension in the air of spillages material from trucks entering or leaving the site will be prevented by limiting the speed of vehicles within the site to 10kmh and by use of a mechanical road sweeper. • The overloading of tipper trucks exiting the site will not be permitted. Aggregates will be transported to and from the site in covered trucks. • Where the likelihood of windblown fugitive dust emissions is high and during dry weather conditions, dusty site surfaces will be sprayed by a mobile tanker bowser. • Wetting agents shall be utilised to provide a more effective surface wetting procedure. • Exhaust emissions from vehicles operating within the construction site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the contractor by ensuring that emissions from vehicles are minimised by routine servicing of vehicles and plant, rather than just following breakdowns; the positioning of exhausts at a height to ensure adequate local dispersal of emissions, the avoidance of engines running unnecessarily and the use of low emission fuels. • All plant not in operation shall be turned off and idling engines shall not be permitted for excessive periods. Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods. • Material stockpiles containing fine or dusty elements including soils shall be covered with tarpaulins. Where drilling or pavement cutting,

grinding or similar types of stone finishing operations are taking place, measures to control dust emissions will be used to prevent unnecessary dust emissions by the erection of wind breaks or barriers. All concrete cutting equipment shall be fitted with a water dampening system.

- A programme of air quality monitoring shall be implemented at the site boundaries for the duration of construction/demolition phase activities to ensure that the air quality standards relating to dust deposition and PM_{10} are not exceeded. Where levels exceed specified air quality limit values, dust generating activities shall immediately cease and alternative working methods shall be implemented.
- A complaints log shall be maintained by the construction site manager and in the event of a complaint relating to dust nuisance, an investigation shall be initiated.
- Dust netting and site hoarding shall be installed along the south, east, and west site boundaries to minimise the propagation of fugitive windblown dust emissions falling on third party lands and existing residential areas.

The table below presents a summary of dust control techniques which will be implemented at the site during demolition activities.

Summary of Dust Control Techniques	
Sources of Particular Matter	**Control Technique**
Loading and unloading processes	**Containment / Suppression**
	Reducing drop heights
	Use of variable height conveyors
	Use of chutes
Double handling transfers points	**Site and process design**
	Reduction of vehicle movements
Aggregate stockpiles	**Appropriate siting**
	Away from closest receptors/site boundaries
	Use of enclosures and bunding
	Reduced drop heights
	Water suppression
	Sprays
	Bowsers
	Covering
	Covered stock bins
	Dust covers
Mobile Crushing of site generated C&D Waste (if applicable)	**Appropriate siting**
	Away from closest receptors/site boundaries
	Use of enclosures and bunding
	Reduced drop heights
	Water suppression
	Sprays

		Bowsers
	Conveyors / transfer points	**Containment**
		Wind boards
		Housings
		Suppression
		Water sprays
		Housekeeping
		Clean up of spilled materials
		Appropriate siting
		Away from closest receptors/site boundaries
	Concrete Cutting Plant	**Suppression**
		Water sprays fitted to equipment/plant
	Roadways including site yard area.	**Suppression**
		Water sprays and bowsers
		Wheel wash at site compounds
	Vehicles	**Washing / Covering**
		Wheel wash to be installed at site exit
		Vehicles exiting the site with C&D loads shall be covered with tarpaulin
Landscape and Visual Impact	Construction Stage will be programmed over a number of years resulting in ongoing infrastructure, building and related works for some period of time. These are generally destructive and visually adverse in nature, but temporary and short term. Best practice site management will be employed including appropriately scaled and located hoarding to screen the site from viewers to the north and east of the site.	
Traffic and Transportation	Prior to commencement of construction, the appointed contractor will be required to prepare a comprehensive and detailed Construction Stage Traffic Management Plan (CTMP), to indicate how it is proposed to manage the traffic impacts during the construction stage and minimise the impact on local residents and businesses. The CTMP will provide information on the potential location of contractor compounds, likely construction routes used for HGV's and general staff, indicative construction working hours and information regarding the potential sub-phases and associated estimated movements. The CTMP shall be submitted to Wicklow County Council for approval prior to commencement of works.	
Material Assets	**Surface Water** The Contractor shall prepare and implement a Demolition & Construction Phase Surface Water Management Plan that ensures avoidance and minimization of effects. This Surface Water Management Plan will be based on the measures outlined in the Construction Management Plan included with this application and include the following mitigation measures. • All water leaving the site during construction will be desilted using standard techniques including silt buster/silt socks etc.	

	• Ground water or run-off that collects in excavations or foundation trenches will be drained or pumped to a construction site water treatment arrangement rather than flowing south towards the marshland area. The water is to be directed into a proprietary settlement tank, with a proprietary 'silt bag' to intercept bulk silt volumes. The water and silt within the unit is to be emptied into a water vacuum tanker and is then to be disposed of off-site to a licenced facility. • Desilting and petrochemical interception of all surface runoff/pumped water will take place for the length of the construction project. • A petrochemical interceptor will be placed on the surface water network prior to discharge. • Local silt traps established throughout site. • Mitigation measures on site include dust control, stockpiling away from watercourse and drains • Stockpiling of loose materials will be a minimum of 20m from drains/ watercourses. • Stockpiles and runoff areas following clearance will have suitable silt barriers to prevent runoff of fines into drainage systems/ watercourses/ March. • Fuel, oil and chemical storage will be sited within a bunded area. The bund will be at least 50m away from drains, excavations and other locations where it may cause pollution. • Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination. Any water-filled excavations, including the attenuation tank during construction, that require pumping will not directly discharge to the adjacent watercourses/ Marsh. Prior to discharge of water from excavations adequate filtration and petrochemical interception will be provided to ensure no deterioration of water quality and ensure compliance with the Water Pollution Acts. • Site layout during excavation works will be designed to ensure vehicles do not enter the works area unless necessary for the excavation and soil removal processes. All machinery leaving the works area will be thoroughly cleaned before being allowed on to public roads. A road sweeper (including vacuum) will be in place (as required) to unsure cleanliness of nearby and haul roads (where necessary), particularly during enabling works. • Dust may deposit on surrounding roads thus entering into the surface water network. Effective site management regarding dust emissions will be carried out. **Wastewater Drainage** The proposed Wastewater drainage system has designed in accordance with the Irish Water Code of Practice for Wastewater Infrastructure IW-CDS-5030-02, IS EN 12056:2000 Gravity Drainage Systems inside Buildings, I.S. EN752: 2017 Drain & Sewer Systems outside Buildings and the Building Regulations Technical Guidance Document Part H. The proposed drainage system will therefore be designed with appropriate capacity for the development to

	ensure self-cleansing velocities are achieved to reduce the risk of blockages and odours. The Contractor's welfare facilities for construction personnel will be located on site in the contractor's compound and wastewater effluent from these facilities shall tanked offsite and disposed of at a suitable location. This will be confirmed in the contractor's Construction Management Plan once complete. During construction, all new sewers shall be pressure tested and CCTV surveyed in accordance with the Uisce Éireann Standards to identify potential defects. Should they arise, shall be repaired prior to the connection. **Water Supply** During Construction, the watermains shall be tested in accordance with the requirements of Uisce Éireann prior to connection. The proposed watermain infrastructure is designed in accordance with Irish Water's 'Code of Practice for Water Infrastructure IW-CDS-5020-03 and provides appropriate capacity for the development to minimise the risk associated with low service pressure. **Electricity** The ESB shall install all of the new incoming supplies to the proposed development. The ESB shall also liaise with the HSE and local residents and keep them fully informed of any brief outages which may be required due to the diversion of any cables. The Contractor shall ensure that construction works on site adhere to the ESB Networks / HSA "Code of Practice for Avoiding Danger from Underground Services". If works do require an outage these shall be planned by the Contractor in advance and the ESB shall liaise with customers advising them of the same. This is a positive, short-term and brief effect. **Telecommunications** The relevant utility provider shall install the new incoming supplies to the proposed development and shall liaise with the HSE to advise of possible outages in order to facilitate the connections. The works shall be carried out such that they minimize disruption to surrounding areas. **Gas** There is no gas infrastructure on the subject site and it is not proposed to provide gas as a utility within the proposed development. Therefore, it is considered the impact of the proposed development on the existing gas network is neutral, imperceptible and permanent.
Waste Management	A project specific RWMP has been prepared in line with the requirements of the guidance document issued by the DoEHLG. Adherence to the high-level strategy presented in this RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery, and disposal of waste material generated during the construction phase of the proposed development. Donnachadh O'Brien Consulting Engineers have estimated that the total volumes of material to be excavated are as follows: Cut will be 44,347.11 m^3

	and Fill 88,861.89 m^3 It is proposed that 90 - 100% of this will be reused on site for Landscaping purposes. Contractor(s) will endeavour to ensure material taken offsite is reused or recovered off-site or disposed of at authorised facility. In addition, the following mitigation measures will be implemented: • On-site segregation of all waste materials into appropriate categories including (but not limited to): - Organic/catering waste (including garden waste from landscaping activities). - Dry Mixed Recyclables. - Mixed Non-Recyclable Waste. - Glass. • Waste electrical and electronic equipment (WEEE) including computers, printers, and other ICT equipment. - Batteries (non-hazardous and hazardous) - Fluorescent bulb tubes and other mercury containing waste (if arising). - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.); and • All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials. • All waste collected from the development will be reused, recycled, or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available. • All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted, or licensed facilities; These mitigation measures will ensure that the waste arising from the construction phase of the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter Pollution Act 1997* and the *EMR Waste Management Plan (2015 - 2021)*. It will also ensure optimum levels of waste reduction, reuse, recycling, and recovery are achieved and will encourage sustainable consumption of resources.
Archaeological, Architectural & Cultural Heritage	Mitigation measures in respect of the archaeological and cultural heritage resource shall commence at the pre-construction stage. On-going archaeological investigation is warranted at the Phase 1 development lands to address its known archaeological potential - based on the identification of an archaeological pit and the recovery of a stray prehistoric axehead – and to address anomalies identified in geophysical survey results. On-going archaeological investigation shall take the form of archaeological test-excavation, which shall be carried out under licence to the National Monuments Service (Department of Housing, Local Government and Heritage) and the National Museum of Ireland, in accordance with Section 26 of the National Monuments Act 1930 (as amended). A metal detector shall be used by an archaeologist to scan the topsoil removed from test trenches to recover any potential additional metal artefacts. Metal detection shall also be

	carried out under licence to the National Monuments Service (Department of Housing, Local Government and Heritage) and the National Museum of Ireland. Any significant archaeological remains exposed during test-excavation shall be considered for avoidance of impact i.e. avoidance through re-design in the first instance, and only subject to full archaeological excavation i.e. preservation by record in the event that avoidance through re-design is not possible. Any strategy for the avoidance or excavation of archaeological remains shall be carried out in consultation, and in agreement with the statutory authorities. The wider Kilbride lands should be considered in any pre-construction mitigation strategy to ensure that any land potentially subject to development related groundworks during Phase 1 works shall be archaeologically resolved prior to commencement of construction related activities. Design strategies to reduce the significant change in the setting of Kilbride Graveyard and the pyramidal Howard Mausoleum have been considered in the design of the proposed development. The Masterplan Framework for the Kilbride Lands has considered the provision of a green buffer to be provided around Kilbride Graveyard, and the maintenance of the site's open vista southwards and south-eastwards towards Arklow town and the coastline. The establishment of a green buffer should be sufficiently sized to maintain the graveyard and Howard Mausoleum's visual dominance in the landscape, and the sites elevation above proposed development heights. Landscaping of an open green buffer or any spine of open space established to maintains views to and from the graveyard should not be designed in a way that impedes the graveyards current visibility from the surrounding landscape. No construction activities should be carried out in the open green buffer to protect the existing topography, sense of open space and vistas at Kilbride Graveyard. The ownership of Kilbride Graveyard has passed to Wicklow County Council to ensure the sustainable long-term conservation of the site, including the pyramidal Howard Mausoleum. Wicklow County Council has to date facilitated the preparation of a Conservation Plan (Whitty and Rees 2021), completed as an action of the County Wicklow Heritage Plan. The Conservation Plan enhances the understanding of the Kilbride Graveyard site, provides steps to conserve the site as a community asset, and will form the basis for future funding for conservation works at the site. An on-going management and maintenance plan for the upkeep of the graveyard is to be drawn up by Wicklow County Council as a recommendation of the Conservation Plan. The proposed bridge crossing relating to the pedestrian/cycle connection to Arklow town will be constructed following the installation of Debris and Gravel Trap infrastructure on the Avoca River associated with the approved Arklow Flood Relief Scheme. The Flood Relief Scheme will be subject to archaeological mitigation and it is anticipated that the location of the proposed pedestrian/cycle bridge will be archaeologically resolved prior to

	construction. It will be necessary to consult with Arklow Flood Relief Scheme archaeological mitigation reporting documents in advance to confirm the extent of archaeological resolution at the proposed bridge crossing. **Construction Phase** Archaeological monitoring of topsoil stripping across the Phase 1 development site shall be carried under licence to the National Monuments Service (Department of Housing, Local Government and Heritage) and the National Museum of Ireland. Monitoring will include all works in the Town Marsh, which may not be suitable for pre-construction archaeological test-excavation, subject to ground conditions or natural heritage constraints. Any potential groundworks at the Avoca River bank or in the riverbed shall also be monitored by an appropriately qualified or maritime archaeologist unless otherwise archaeologically resolved in advance as part of the Arklow Flood Relief Scheme works. Should archaeological features or material be uncovered during the construction phase, on-going archaeological mitigation shall be made in agreement with the statutory bodies. The position of potential construction compounds and storage locations for materials and spoil shall be agreed in advance, and prior to any groundworks connected with such activities, with an archaeologist.

16.3 Operational Phase

Population and Human Health	The proposed development has been designed to avoid negative impacts on population and human health through the provision of various physical and social infrastructure as part of the development as are outlined in Chapter 3 of this EIAR. Compliance with the proposed design and layout will be a condition of any permitted development. Monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission. Furthermore, measures outlined in the chapters of this EIAR which address other environmental matters such as water, air quality and climatic factors, landscape and visual impact and noise sufficiently address monitoring requirements. Chapter 9 Climate and Air Quality notes the proposal includes operational phase mitigation by design measures to minimise the impact on air quality and climate. These include efficient glazing, thermal insultation, and the inclusion of electric car charging points. Chapter 11 Traffic and Transportation has been prepared for the proposed development with the aim of encouraging sustainable travel practices for all journeys. Increased sustainable travel practices will also reduce the negative impact of traffic emissions on the air quality. No additional mitigation measures are considered necessary.
Biodiversity	The biodiversity value of the site would be expected to improve as the landscaping matures. The proposed development has a sustainable drainage strategy and detailed landscape strategy and mitigation during operation will be carried out as outlined elsewhere in the EIAR. The following operation mitigation measures will be carried out:

	1. Post construction an inspection of drainage connections to the watercourse network will be carried out by the project ecologist. 2. Post construction monitoring and surveys for bats in the marsh and along the Avoca River Estuary will be carried out. 3. A post construction prototype light spill assessment and bat activity assessment will be carried out along the boardwalk.
Land, Soil and Geology	There is limited impact on the geological environment of the area expected during the operational phase of the development.
Hydrology and Hydrogeology	The nature of the proposed development as a boardwalk means that the potential contaminant load and accidental spillage risk is minimal during operational phase. The existing surface water drainage systems in the marsh will be maintained as part of the development. The proposed scheme will incorporate the application of SuDS best practice and GDSDS when designing the surface water drainage network for the site. Foul drainage for the proposed Project will be in accordance with the relevant standards for design and construction as detailed in the Infrastructure Design Report.
Noise and Vibration	<u>Additional Traffic on Adjacent Roads</u> During the operational phase of the development, noise mitigation measures with respect to the outward impact of traffic from the development are not deemed necessary. <u>Mechanical Services Plant</u> Noise levels associated with operational plant are expected to be well within the adopted day and night-time noise limits at the nearest noise sensitive properties taking into account the site layout, the nature and type of units proposed and distances to nearest residences. Assuming the operational noise levels do not exceed the adopted design goals, the resultant residual noise impact from this source will be of neutral, Imperceptible, long-term impact. <u>Inward Noise (Acoustic Design Strategy Part 2)</u> As is the case in most buildings, the glazed elements and ventilation paths of the building envelope are typically the weakest element from a sound insulation perspective. In general, all wall constructions (i.e. blockwork or concrete and spandrel elements) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal. In this instance the facades highlighted in Figure 9.8 will be provided with upgraded acoustic glazing and ventilation that achieves the minimum sound insulation performance as set out in the tables below. Other facades in the development have no minimum requirement for sound insulation. The sound insulation specifications are expressed in the following units:

	R_w	Weighted Sound Reduction Index – This is the value of the sound insulation performance of a partition or element measured under laboratory conditions. It is a weighted single figure index that is derived from values of sound insulation across a defined frequency spectrum. Technical literature typically presents sound insulation data in terms of the Rw parameter.
	$D_{n,ew}$	Weighted element-normalized level difference. This is the value of sound insulation performance of a ventilator measured under laboratory conditions. It is a weighted single figure index that is derived from values of sound insulation across a defined frequency spectrum. Technical literature for acoustic ventilators typically presents sound insulation data in terms of the Dn,e,w parameter.

SRI (dB) per Octave Band Centre Frequency (Hz)						dB R_w
125	250	500	1k	2k	4k	38

The overall Rw and Dn,e,w outlined above are provided for information purposes only. The over-riding requirements are the octave band sound insulation performance values which may also be achieved using alternative glazing and ventilation configurations. Any selected system will be required to provide the same or greater level of sound insulation performance as that set out in Tables above. It is important to note that the acoustic performance specifications detailed herein are minimum requirements which apply to the overall glazing and ventilation systems. In the context of the acoustic performance specification the 'glazing system' is understood to include any and all of the component parts that form part of the glazing element of the façade, i.e. glass, frames, seals, openable elements etc. The assessment has demonstrated that the recommended internal noise criteria can be achieved through consideration of the proposed façade elements at the detailed design stage. The calculated glazing and ventilation specifications are preliminary and are intended to form the basis for noise mitigation at the detailed design stage. Consequently, these may be subject to change as the project progresses.

Air and Climate

No additional mitigation measures are required as the operational phase of the proposed development as it is predicted to have an imperceptible impact on ambient air quality and climate.

The operational phase mitigation by design measures to minimise the impact of the development on air quality and climate are as follows:

Mitigation Measures (Operational)

- Thermally efficient glazing systems on all units
- Mechanical Ventilation and Heat Recovery (MVHR) systems or equivalent installed in all residential developments
- Thermal insulation of walls and roof voids of all units
- Natural Gas heating in all units

	• Inclusion of electric car charging points to encourage electric vehicle ownership
Landscape and Visual Impact	Avoidance and mitigation by design were incorporated into the design. A Landscape Masterplan was prepared in order to maximise retention of the most important landscape elements, to create a design with a strong sense of place, and to avoid and reduce landscape and visual effects. The Design Strategy incorporates the Development Plan policies and objectives contained in the Estuary Masterplan outlined in Section 10.3. These are incorporated into the Landscape Masterplan (illustrated in Figure 10.1). A balance between built form and open space is proposed, which enhances the legibility and the permeability of the site and contributes to place-making in a newly evolving neighbourhood. The Landscape Masterplan includes the following elements which reduce the landscape and visual effects. In summary, the retention of trees is proposed where possible. Key areas include the area along the Broadmeadow river, and the retention of the majority of trees here will assist in creating a pleasant public open space and important green link, as well as screening the development from the north, as seen in Viewpoints 10 and 11. The north-south link which includes the retained hedgerow is smaller in scale, but will assist in breaking up the space internally, as well as being viewed as a green space as shown in Viewpoint 7.
Traffic and Transportation	To support and enable residents to travel to and from the development by sustainable modes, a supporting Outline Mobility Management Plan (OMMP) has been prepared and is included within the Traffic & Transport Assessment included within Appendix 11 of this EIAR. The overall aim of the MMP is to reduce the level of private car use by encouraging people to walk, cycle, use public transport or car share. The site is well-located to support walking and cycling trips between the site and the town centre. This will improve significantly when the proposed Boardwalk link and new river crossing is constructed as part of the development. The internal road and street network includes the provision of dedicated cycle facilities and an environment that will encourage safe walking and cycling. Furthermore, co-location of the development with the proposed Local Centre and the permitted adjacent educational campus will ensure that incidental trips for local services and trips to school for residents can be made by walking and cycling as opposed to by private car. The Local Centre also includes for the provision of The OMMP includes a number of initial measures to be undertaken at the development, including the appointment of a Mobility Manager, and recommendations for monitoring and review post-occupation.
Material Assets	**Surface Water** Surface Water runoff from the proposed development will be managed in accordance with the requirements of the Greater Dublin Strategic Drainage Study (GDSDS), with surface water attenuation and retention included as part of the main surface water drainage system. The surface water management proposals

	shall serve to significantly reduce the overall impact of the proposed development on the existing environment and shall reduce the risk of flooding in the receiving public surface water network. The features to be maintained include the Retention basins, Bioretention Areas, Tree pits, attenuation tanks, sumps in manholes, flow control device and permeable paving, **Wastewater Drainage** Irish Water shall implement an operational inspection and maintenance regime to ensure the system keeps operating within the design specifications. This is a positive, significant and long-term effect. **Water Supply** The Proposed water supply system shall be commissioned and subject to a, as a minimum, monthly operational inspection and maintenance regime to ensure that the system keeps operating within the design specifications. This is a positive, significant and long-term effect. **Electricity** The proposed electricity supply system shall be commissioned and subject to a regular operational inspection and maintenance regime, in accordance with the Utility providers procedures, to ensure the system keeps operating within the design specifications. This is a positive, moderate and long-term effect. **Telecommunications** The proposed telecommunications system shall be commissioned and subject to a regular operational inspection and maintenance regime, in accordance with the Utility providers procedures, to ensure the system keeps operating within the design specifications. This is a positive, moderate and long-term effect. **Gas** There is no gas infrastructure on the subject site and it is not proposed to provide gas as a utility within the proposed development. Therefore, it is considered the impact of the proposed development on the existing gas network is neutral, imperceptible and permanent.

Waste Management	All waste materials will be segregated into appropriate categories and will be stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site in accordance with the *Wicklow County Council Development Plan 2022 – 2028*.
	In addition, the following mitigation measures will be implemented:
	• On-site segregation of all waste materials into appropriate categories including (but not limited to):
	  ○ Organic/catering waste (including garden waste from landscaping activities).
	  ○ Dry Mixed Recyclables.
	  ○ Mixed Non-Recyclable Waste.
	  ○ Glass.
	  ○ Waste electrical and electronic equipment (WEEE) including computers, printers, and other ICT equipment.
	  ○ Batteries (non-hazardous and hazardous)
	  ○ Fluorescent bulb tubes and other mercury containing waste (if arising).
	  ○ Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.); and

	• All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials. • All waste collected from the development will be reused, recycled, or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available. • All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted, or licensed facilities; and These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, and all associated Regulations. It will also ensure optimum levels of waste reduction, reuse, recycling, and recovery are achieved.
Archaeological, Architectural & Cultural Heritage	No operational phase mitigation is recommended in the event pre-construction and construction phase mitigation is carried out in full.