Chapter 17 Cumulative Impacts

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17. CUMULATIVE IMPACTS

17.1 Introduction

The assessment considers the cumulative impact of the Proposed Development alongside the related development at the end user site and other planned and permitted developments.

One related development has been identified and it consists of the conversion of the existing 116 MW Cushaling Peaker Plant located within the Edenderry Power Station from hydrotreated vegetable oil (HVO) to natural gas, with HVO as back up fuel. These works have not yet commenced however the completion date is expected to coincide with the completion of the Proposed Development (c. Q4 2029 / Q1 2030).

In addition, this chapter evaluates the potential cumulative impact of the Proposed Development with other existing, approved, and future developments identified in Chapter 2, Appendix 2.3 these include an Eirgrid PLC application to Offaly County Council (OCC) to upgrade the existing Rinawade – Dunfirth Tee – Kinnegad 110kV overhead line (OCC Reg. Ref.: 2560500), the Ballydermot Wind Farm (not yet in the planning system) and the proposed Water Supply Project Eastern and Midlands Region (An Coimisiún Pleanála (ACP) Reg. Ref.: 323980).

Authors of all relevant chapters of the EIAR have undertaken an assessment of potential cumulative impacts during both construction and operational phases. These findings have been consolidated and are presented in this chapter.

17.2 Legislation

The cumulative effects are assessed in this chapter in accordance with the most relevant guidance, including:

- EIA Directive (2011/92/EU) as amended by EIA Directive (2014/52/EU)
- Planning and Development Act 2000 (as amended)
- Planning and Development Regulations 2001 (as amended)
- Guidelines on the Information to be Contained in EIA Reports (EPA, 2022)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out EIA (Department of Housing, Planning and Local Government, 2018)
- Guidance on the preparation of the EIA Report (European Union, 2017)
- Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions, European Commission, 1999

17.3 Methodology

The EPA's Guidelines on the Information to be Contained in EIA Reports (EPA 2022) defines cumulative impacts as "The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects". The EPA 2022 guidance states (Page 54) that this assessment is required because a single activity can have a minor impact on its own, however, when combined with other impacts (minor or significant), it can have a cumulative impact that is collectively significant. It may also be relevant to consider the possible potential environmental loadings resulting from the development of zoned lands in the planned project's immediate vicinity.

European Union's Guidance on the preparation of the EIA Report (EU 2017) states that "It is important to consider effects not in isolation, but together; that is, cumulatively. "Cumulative effects are changes to the environment that are caused by an action in combination with other actions. They can arise from:

- the interaction between all of the different Projects in the same area; and
- the interaction between the various impacts within a single Project

The European Union (EU) 2017 guidance is also clear that the effects to be assessed in the EIA should be determined to be significant. This ensures that effort is not wasted on insignificant effects.

In accordance with EIA Guidance (EPA, 2022), where uncertainty exists, an EIAR must present the 'worst-case' scenario for the accumulation of effects arising from other projects. To address this, and to account for future developments, the cumulative impact assessment considers the Proposed Development alongside any related developments, as well as existing and/or approved projects.

17.4 Description of Related Development(s)

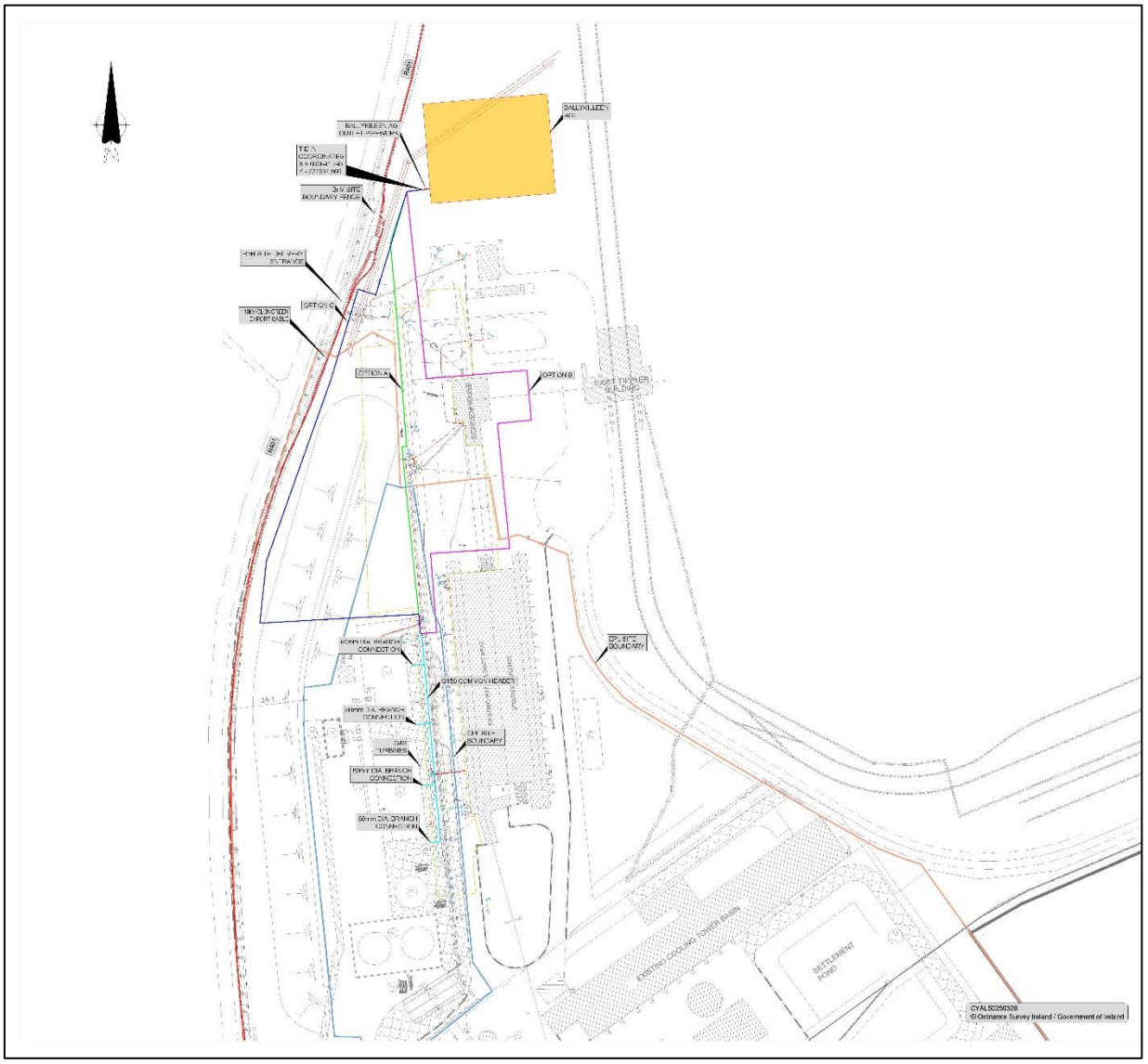
In the context of an EIA, a related development refers to any proposed, ongoing, or planned project, activity, or undertaking that is directly or indirectly connected to the Proposed Development under assessment. These related developments may interact with the Proposed Development, potentially resulting in cumulative environmental effects that must be considered.

The purpose of the proposed GNI 143 Ballykilleen Pipeline to connect from the existing 750mm NB BGE77 pipeline (also known as Pipeline to the West (PTTW)) to the Edenderry Renewable Energy Complex. The Proposed Development is intended to facilitate the conversion of the existing Cushaling Peaker Plants within the Edenderry Renewable Energy Complex from their current single-fuel operation (liquid fuel) to dual-fuel operation, with natural gas as the primary fuel and HVO retained as backup. A description of the conversion of the anticipated development works at the Edenderry Renewable Energy Complex is provided in Section 2.8 of Chapter 2 of this EIAR.

At this stage of the project, the design of the above elements requires further design to determine the full extent of works required. However in order to consider the potential for cumulative effects of this related development. Preliminary routing has been undertaken to provide an indicative alignment. The indicative alignment is subject to further refinement, additional site investigations, verification of third-party services, and engineering assessments will be undertaken as the project advances to the next design stages, and these may result in localised adjustments or minor modifications to the proposed route. Three routing options are illustrated in Figure 17-1 below. The Ballykilleen AGI is also shown as a yellow area to the north of the site into which the infrastructure related to the conversion will connect.

It is assumed that the construction timelines of the Proposed Development and the related development will overlap for the purposes of the cumulative assessment. The overlap is considered temporary in duration (effects lasting less than a year).

Figure 17-1 Cushaling Peaker Plant Conversion Routing Option Study



17.5 Description of Other Existing / Permitted Development(s)

As part of the assessment of the impact of the Proposed Development, account has been taken of relevant developments that are currently permitted, or under construction and substantial projects for which planning has been submitted within the surrounding areas.

The identification of relevant, currently permitted, and future developments follows a two-fold approach. Firstly, a comprehensive search is undertaken to identify all developments within the vicinity of the Proposed Development site. Subsequently, a review of the magnitude, size, scale, location and current status of these developments is undertaken to assess their potential to contribute to significant cumulative effects. This secondary stage is conducted in alignment with the 2017 Guidance from the European Union (EU), which underscores the necessity to focus on effects that are either inherently significant or possess the potential for significance. This comprehensive review is crucial in the context of assessing the potential cumulative effects of a proposed project. It aids in gauging the extent to which these existing and future undertakings might, interact with the Proposed Development, and allow for the exclusion of insignificant developments from any further consideration. This strategic approach ensures that resources are not expended on negligible or inconsequential effects.

The initial stage of this process is facilitated through the utilisation of a planning search tools listed below which collectively hold a comprehensive inventory of planning applications, which systematically generated a comprehensive list of relevant planning permissions granted within the immediate environs of the Proposed Development. A combination of online mapping tools was used for this search including:

- The Department of Housing, Local Government and Heritage EIA Portal[1]
- An Coimisiún Pleanála Map Search[2]
- My Plan National Planning Application Map Viewer[3]
- Offaly County Council Planning Map Viewer[4]
- Meath County Council Planning Map Viewer[5]
- Kildare County Council Planning Map Viewer[6]

All Proposed Developments within 2km of the Proposed Development site boundary that have been granted in the last 5 years were noted during the planning search. Upon evaluation of the size, scale, spatial reach, magnitude, and separation distances of these permitted, and future developments, it is evident that there are developments which would be capable of combining with the Proposed Development and resulting in cumulative effects during the construction phase. In essence, the identified permitted, and future developments due to their respective sizes, scales, and physical separations, in the absence of mitigation measures, do present a likelihood of interacting with the Proposed Development in a manner that could lead to cumulative effects throughout the construction phase.

The search also identified a number of small extensions, retention, and other minor alterations to dwelling houses. These permissions were for established residential properties and businesses within the vicinity of the development. In addition, a number of new one-off dwellings were noted during the search, these developments are deemed to be at a sufficiently small scale, low complexity and sufficient proximity that they will not cumulative interact with the Proposed Development, that is, their cumulative significance will be imperceptible. The outcome of this search and review is detailed in Appendix 2.3 of Chapter 2.

[1] https://www.gov.ie/en/publication/9f9e7-eia-portal/
[2] https://www.pleanala.ie/en-ie/Map-search
[3] https://www.myplan.ie/national-planning-application-map-viewer/
[4] https://www.offaly.ie/planning-search/
[5] https://www.meath.ie/council/council-services/planning-and-building/planning-permission/view-or-search-planning-applications
[6] https://webgeo.kildarecoco.ie/planningenquiry

Three projects have been identified in particular given there proximity and scale: upgrade works to the existing Rinawade – Dunfirth Tee – Kinnegad 110kV overhead line (Offaly County Council (OCC) Reg. Ref.: 2560500), the planned Ballydermot Windfarm and the proposed Water Supply Project Eastern and Midlands Region (An Coimisiún Pleanála (ACP) Reg. Ref.: 323980).

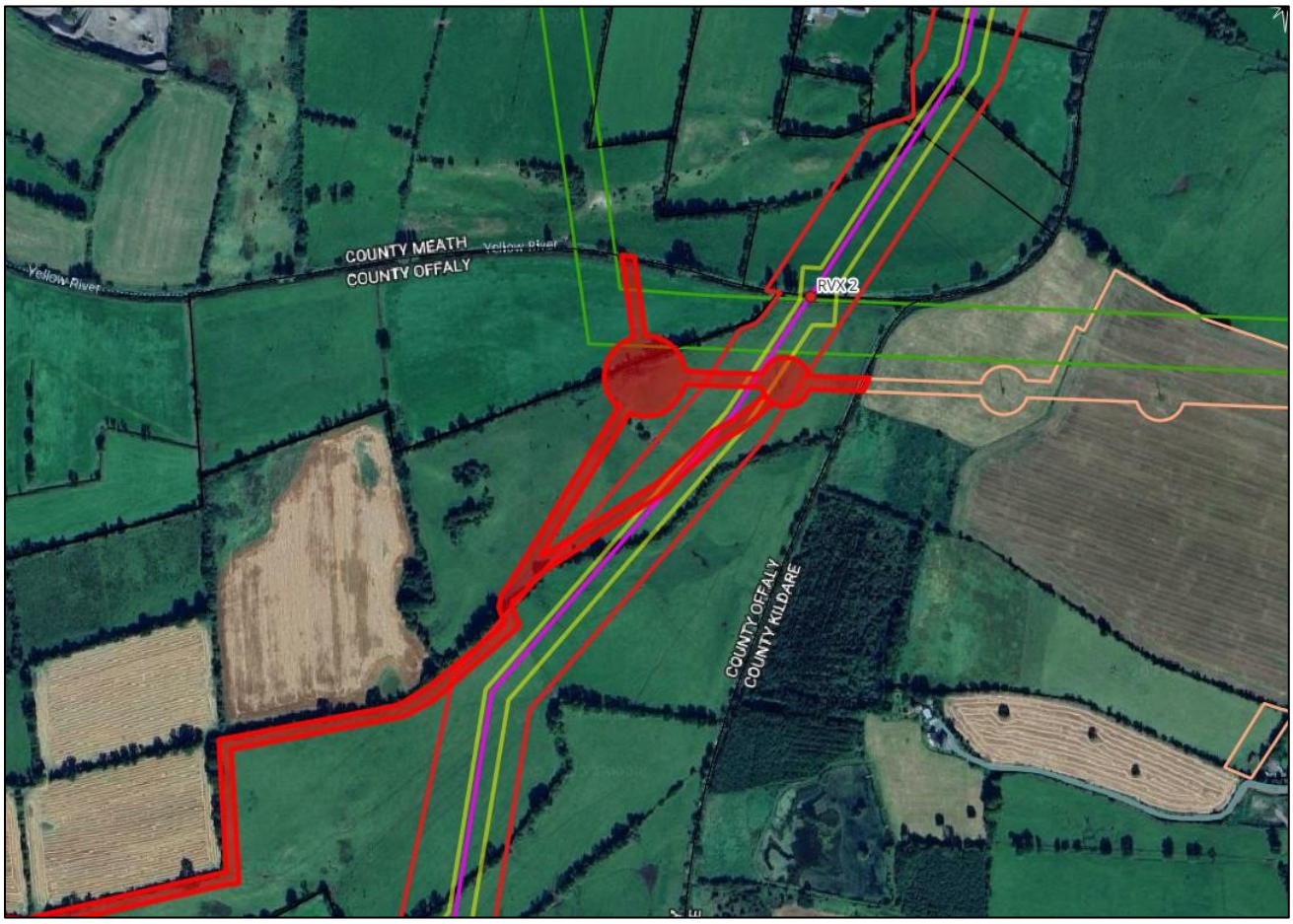
17.5.1.1 Eirgrid PLC application to Offaly County Council (OCC) to upgrade the existing Rinawade – Dunfirth Tee – Kinnegad 110kV overhead line (OCC Reg. Ref.: 2560500)

Eirgrid PLC application to OCC to upgrade the existing Rinawade – Dunfirth Tee – Kinnegad 110kV overhead line (OCC Reg. Ref.: 2560500) which intersects with the Proposed Development redline immediately south of where the Proposed Development crosses the Yellow River only (chainage c. 11350 – 11700). This is illustrated in Figure 17-2 below.

The environmental conditions stipulated in the OCC Reg. Ref. 2560500 are as follows and relate to the following environmental factors:

- Condition 2 – CEMP, Biodiversity (AA Screening / NIS), Construction Drainage
- Condition 3 – Prevention of spillages and management of soil and Dust during construction
- Condition 4 – Management of surface water generated during operation; management of riparian zones
- Condition 5 – Operational Waste Management, IPC Licence requirement, Article 27 utilisation, Resource and Waste Management Plan

Figure 17-2 Permitted upgrade to the existing Rinawade – Dunfirth Tee – Kinnegad 110kV overhead line intersection with the Proposed Development (redline boundary, working width and pipeline route are indicative only)



17.5.1.2 Water Supply Project Eastern and Midlands Region (An Coimisiún Pleanála (ACP) Reg. Ref.: 323980)

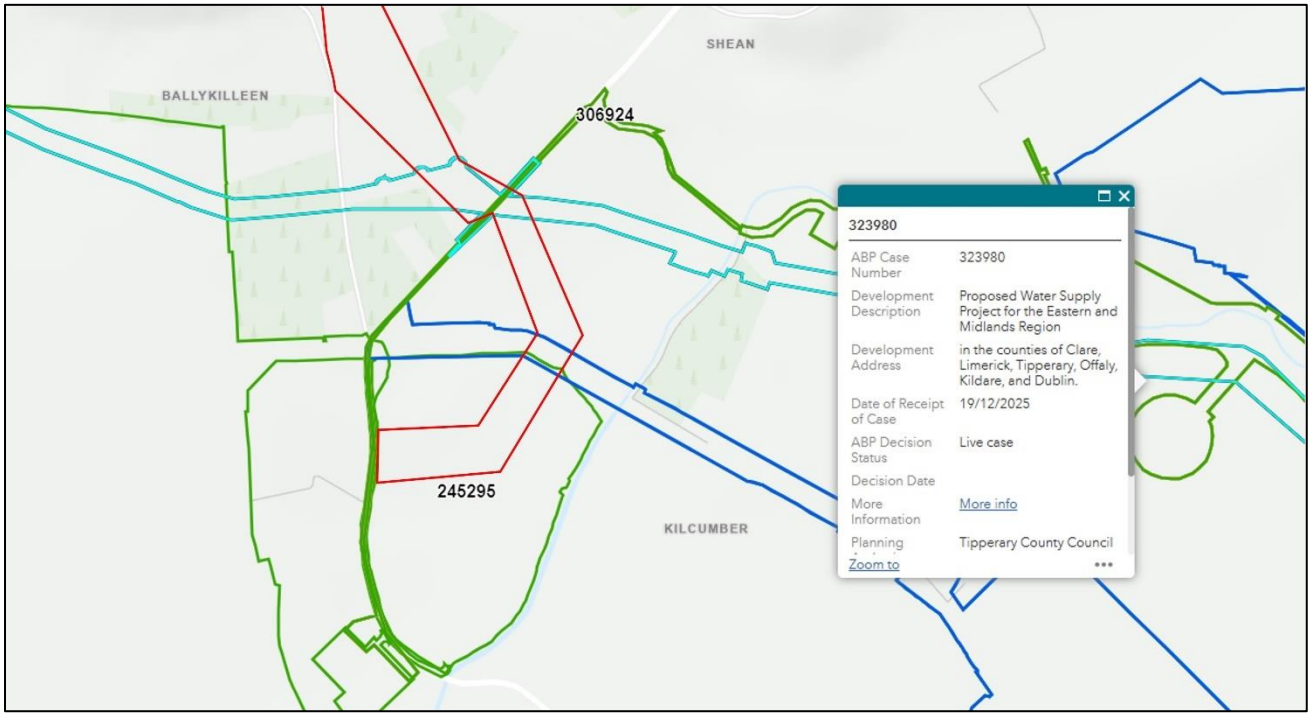
The proposed Water Supply Project Eastern and Midlands Region (An Coimisiún Pleanála (ACP) Reg. Ref.: 323980) comprises an abstraction of raw water from Parteen Basin on the Lower River Shannon and various elements of water supply infrastructure, which collectively would extend from Parteen Basin in County Tipperary, through the Midlands, to Peamount in County Dublin. Six Local Authorities are partly within the Planning Application Boundary: Limerick City and County Council, Clare County Council, Tipperary County Council, Offaly County Council, Kildare County Council and South Dublin County Council. The planning application for this project was submitted to ACP on the 19th of December 2025.

The Water Supply Project intersects the Proposed Development in the vicinity of the Edenderry Renewable Energy Complex, immediately north of the Edenderry Power Station site (approximately chainage c. 22,500–22,800). At this location, the proposed water supply pipeline crosses the route of the proposed gas transmission pipeline at the road and watercourse crossings identified in this EIAR as RDX17 and WCX29. This crossing is identified as RDX087 in the Water Supply Project planning application Environmental Impact Assessment Report (EIAR Volume 2: Proposed Project Description, Chapter 4).

According to the EIAR submitted for the Water Supply Project, construction is not anticipated to commence prior to Q1 2028, with construction works expected to extend over a period in excess of four years and to be largely complete by approximately 2032. The commence date of construction of the Proposed Development is Q1 2028 and expected to be complete over a maximum period of 22 months assuming none of the Proposed Development elements (Pipeline, AGPC and Ballykilleen) are constructed

concurrently, with construction being finalised by Q4 2029. There is therefore a possibility of concurrent construction phases for these projects.

Figure 17-3 Proposed Water Supply Project Eastern and Midlands Region (ACP Reg. Ref.: 323980) in light blue with indicative redline for the Proposed Development (redline boundary is indicative only)



17.5.1.3 Potential Future Development Ballydermot Windfarm project

The Ballydermot Windfarm project is not currently in the planning system. The extent of the planned Wind farm can be seen in Figure 17-4 below. The Edenderry Power Station is also indicated near the eastern edge of Figure 17-4 and it is illustrated that it is located over 2 km from the planned development. The Proposed Development would also be located over 2km from this project.

Figure 17-4 Planned Ballydermot Windfarm (Source: ballydermotwindfarm.ie)

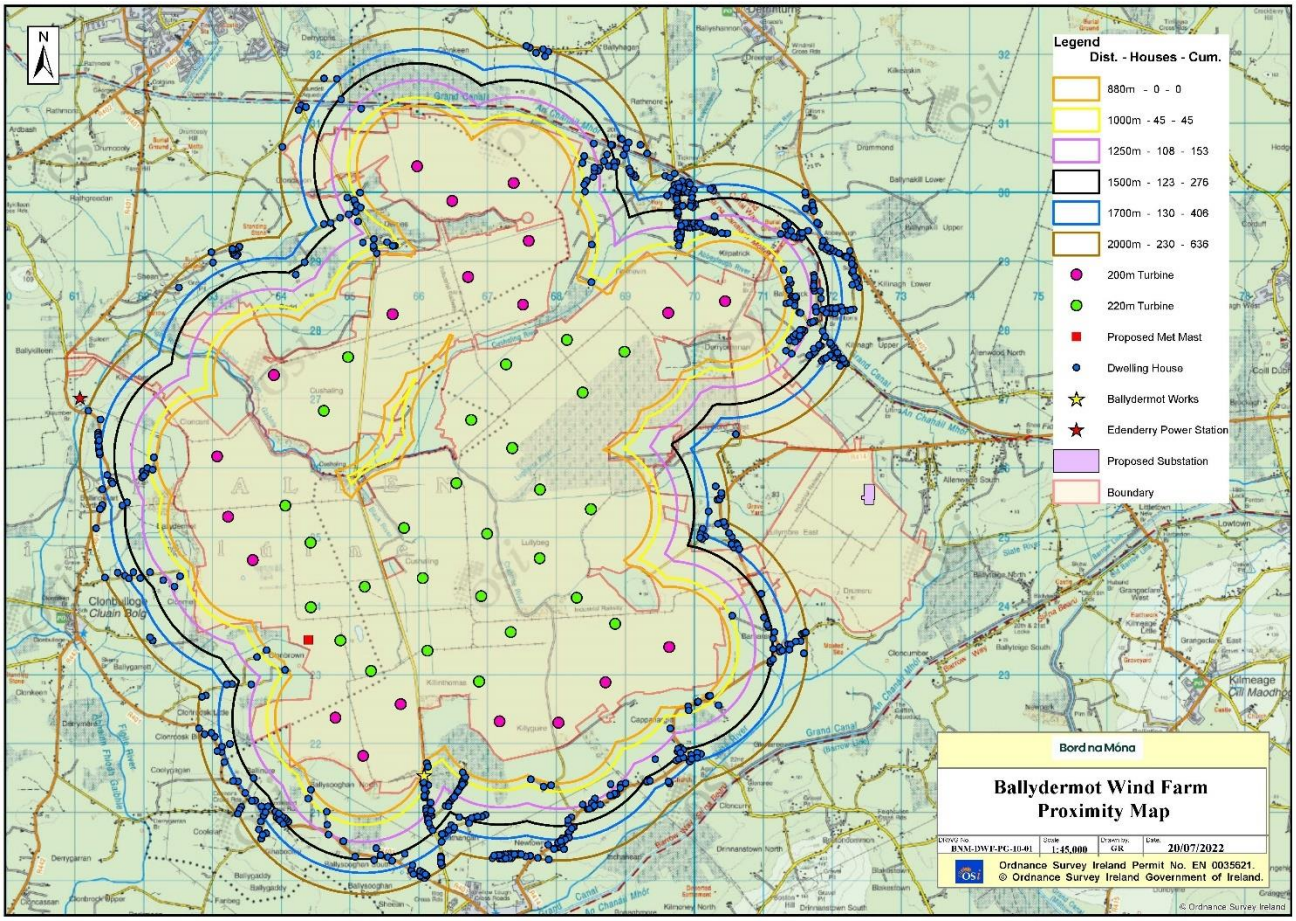
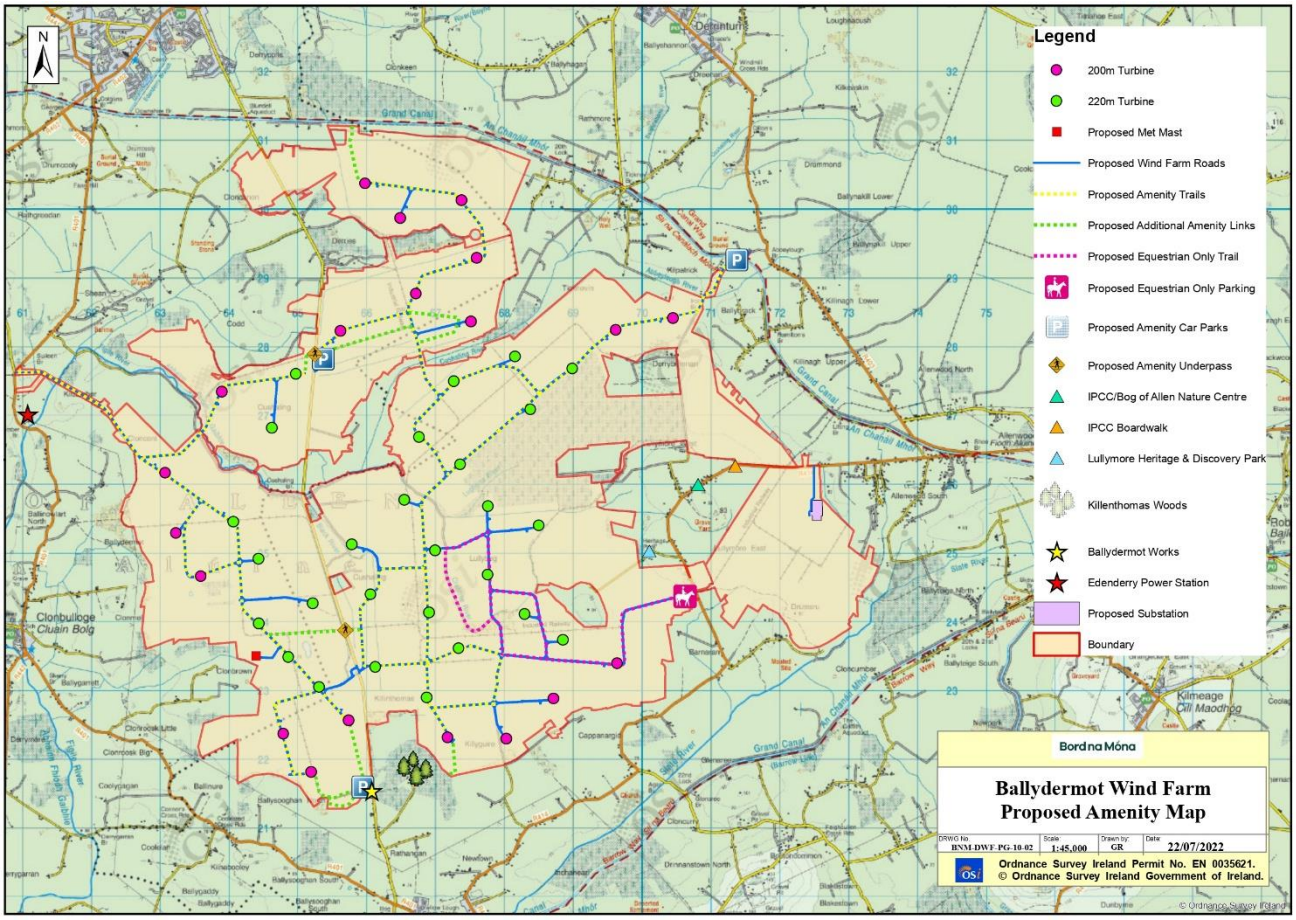


Figure 17-5 Planned Ballydermot Windfarm Amenity Map (Source: ballydermotwindfarm.ie)



17.6 Human Health and Populations

17.6.1 Construction Phase

17.6.1.1 Related Developments

The construction phase of the Proposed Development, once appropriate mitigation measures as outlined in each chapter of this EIAR are implemented, will not result in significant effects on human health, populations, and the surrounding land uses, during construction. The main outward emissions from the Proposed Development during the construction phase that could be capable of resulting in cumulative impacts, and effects on human health and populations, are air quality (dust), noise, vibration, and traffic.

The proposed GNI 143 Ballykilleen Pipeline is intended to facilitate this fuel transition by providing a connection between the existing gas transmission network and the Edenderry Renewable Energy Complex. In this context, the principal construction activity associated with the related development that is relevant to cumulative effects is the installation of a new internal gas transmission pipeline linking the Ballykilleen AGI to the turbine compound.

Other elements of the Cushaling conversion, including the installation of gas skids, modifications to internal pipework, valves and ancillary controls, and the reconfiguration of existing plant, are small in scale and will be located within the established industrial footprint of the site. These works are not expected to give rise to significant construction-phase impacts on human health, either individually or cumulatively.

Contractors engaged in construction of the Proposed Development will be required to comply with a project-specific Construction Environmental Management Plan (CEMP), incorporating mitigation measures

outlined in this EIAR. Similarly, construction activities associated with the related development will be subject to appropriate environmental controls under existing regulatory and operational frameworks. As such, construction activities will be governed by comparable binding limits for dust, noise, vibration, and traffic-related effects.

In the context of the established industrial environment, and having regard to the limited scale and localised nature of the works, the construction-phase cumulative effects of the Proposed Development in combination with the Edenderry Renewable Energy Complex construction on human health and populations are assessed as ***neutral, imperceptible***, and ***short term.***

17.6.1.2 Other Existing / Permitted Development(s)

The Proposed Development, once appropriate mitigation measures as outlined in each chapter of this EIAR are implemented, will not result in significant effects on human health, populations, and the surrounding land uses during construction. The main outward emissions from the Proposed Development during the construction phase that could be capable of resulting in cumulative impacts, and effects on human health and populations, are traffic, air quality (dust) and additional noise and vibration.

In a worst-case scenario, multiple developments within the area could be constructed concurrently or have overlapping construction phases, resulting in the potential for cumulative impacts in terms of traffic, dust and noise. Contractors for the Proposed Development will be contractually required to operate in compliance with a project-specific CEMP and Construction Traffic Management Plan, which will incorporate the mitigation measures outlined in this EIAR. Construction activities within the overall development of the applicant-owned lands will be subject to binding limits for noise, dust and emissions to water.

Implementation of the mitigation and monitoring measures detailed in Sections 5.6.1 and 5.7.1 of Chapter 5, together with compliance of nearby permitted developments with their respective planning conditions, will ensure that cumulative changes to land, soils, geology and the hydrogeological environment during the construction phase remain minimal. Accordingly, the residual cumulative impact on these aspects of the environment, and on human health, arising from the Proposed Development in combination with other planned or permitted developments is assessed as neutral, imperceptible and short-term.

As per Chapter 6, as there is no source pathway linkage, no residual impacts are anticipated on human health and populations from water emissions. No cumulative impacts are predicted in relation to Hydrology Or Hydrogeology.

In the event that construction activities at nearby sites occur concurrently with construction of the Proposed Development, there is potential for cumulative noise impacts. In accordance with BS 5228-1 guidance, overlapping construction activities from nearby developments may result in cumulative construction noise effects at nearby sensitive receptors. Developments with the potential for overlapping construction phases are identified in Section 17.11.1 of this Chapter 17 (Cumulative Impacts). Provided the mitigation measures outlined in Section 10.6.1 of Chapter 10 (Noise and Vibration) are implemented throughout the construction phase, significant cumulative noise and vibration impacts are not predicted.

Similarly, in line with IAQM guidance (2024), should the construction phase of the Proposed Development coincide with that of other developments within 500 m, there is potential for cumulative construction dust impacts. Provided the mitigation measures outlined in Section 8.6.1 of Chapter 8 (Air Quality) are implemented throughout the construction phase, significant cumulative dust impacts are not predicted.

Whilst the proposed, related developments, and other existing/permitted developments will result in an increase in construction activity intensity and/or an extension of the construction period, the potential for these activities to give rise to significant cumulative effects on landscape character and visual receptors is considered to be limited. If constructed concurrently, they would result in an increased intensity of construction stage activity within the study area, the contribution of the Proposed Development to such cumulative effects is anticipated to be comparatively minor. This is attributable to the limited scale and

extent of the Proposed Development and, in particular, the predominantly underground nature of the pipeline corridor, which would give rise to construction stage effects that are largely localised and temporary in nature. Thus, it is deemed that the construction stage cumulative effects with other related developments and existing/permitted developments will be limited and not significant.

17.6.2 Operational Phase

17.6.2.1 Related Developments

Once constructed, the GNI 143 Ballykilleen Pipeline will be buried underground and will not give rise to direct significant operational emissions. It will therefore not introduce operational pathways that could adversely affect human health, either alone or in combination with the Cushaling Peaker Plant conversion.

The Cushaling Peaker Plant will operate within the parameters set by the EPA under its IE Licence, with no change in operating hours, operational frequency, plant mode, or overall operational status associated with the fuel transition.

The operational phase cumulative effect of the Proposed Development in combination with the related developments with regards to human health and populations is considered to be ***neutral, imperceptible,*** *and* ***long term.***

17.6.2.2 Other Existing / Permitted Development(s)

Overall, while the Proposed Development and the existing permitted development will represent some of the more notable built developments within the immediate site context, no significant cumulative impacts are anticipated to arise from the Proposed Development in combination with other existing, permitted or consented developments.

With respect to operational land and water emissions, Chapters 5 (Land, Soils and Geology) and 6 (Hydrology & Hydrogeology), state that as there is no source pathway linkage no mitigation is required and the residual effect on human health and populations during operations is ***neutral, imperceptible*** and ***long-term.*** Therefore, no cumulative impacts are predicted in relation to Land, Soils and Geology, Hydrology or Hydrogeology.

All other developments referenced will also be required to incorporate measures to protect soil and water quality in compliance with legislative standards for receiving water quality, including the European Communities Environmental Objectives (Groundwater) Regulations (S.I. No. 9 of 2010 and S.I. No. 266 of 2016). As a result, there is minimal cumulative potential for changes to soil quality or the natural groundwater regime, and the likely cumulative impact is considered to be neutral and imperceptible.

The pipeline will not generate operational traffic with an associated a negligible effect the road network and neutral residual impact.

Potential cumulative air quality effects on human health were assessed having regard to emissions from the existing IE-licensed plant, the Proposed Development, and the related Cushaling Peaker Plant fuel conversion. The detailed assessment of emissions and ambient air quality impacts is presented in Section 17.9.2. The proposed transition from liquid fuel to natural gas will result in lower emissions of key pollutants including nitrogen oxides (NO_x), sulphur dioxide (SO_2), and particulate matter (PM_{10} and $PM_{2.5}$). This transition is therefore expected to represent a net improvement in air quality.

Potential cumulative effects on human health arising from operational noise and vibration have been assessed with reference to Chapter 10 (Noise and Vibration). As the operational noise impact associated with the Proposed Development is neutral, imperceptible and long term, there will be no cumulative noise or vibration effects associated with the Proposed Development.

The COMAH status assessment confirms that the Proposed Development does not give rise to cumulative major accident hazards when considered in combination with the related Cushaling Peaker Plant conversion or other developments in the area.

The Proposed Development will make a very modest landscape and visual contribution to cumulative operational effects when considered in combination with other existing and permitted developments which generally comprise more prominent built forms.

The operational phase cumulative effect of the Proposed Development in combination with other planned or permitted developments with regards to human health and populations is considered to be ***negative, not significant,*** *and* ***long term.***

17.7 Land, Soils and Geology

17.7.1 Construction Phase

17.7.1.1 Related Development

The Edenderry Renewable Energy Complex is an established industrial site where land and soils have already been subject to historic disturbance arising from existing development, including areas of hardstanding, foundations, underground services and drainage infrastructure. As a result, soils within the complex are generally engineered and modified, particularly in the vicinity of existing plant, access roads and services.

The potential for cumulative impacts on land, soils, and geological environments in respect of the Proposed Development and the related developments during a simultaneous construction phase would be as a result of engineering works including:

- Control of soil excavation and export from site;
- Sources of fill and aggregates for the Proposed Development;
- Accidental spillages and leakage from construction traffic and construction materials may occur, which could result in localised contamination of soils and groundwater underlying the site; and
- The removal of topsoil and subsoil cover during construction, which will further increase the vulnerability of the underlying bedrock.

Any such cumulative effects would be confined to the operational footprint of the Edenderry Renewable Energy Complex and would not extend into the wider agricultural lands crossed by the Proposed Development pipeline. The related development is small in scale and largely confined to previously disturbed industrial ground; the internal gas pipeline is short in length and located wholly within an existing developed site; no new greenfield or agricultural soils are affected by the related development; and best-practice soil management, pollution prevention and spill control measures will be implemented as part of standard construction controls.

Contractors for the Proposed Development will be contractually required to operate in compliance with the CEMP which will be followed by the construction contractor and include the mitigation measures outlined in this EIAR. The CEMP for these projects will include mitigation measures to protect soil and water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 as amended by S.I. 366 of 2016 and by S.I. 287 of 2022).

In the context of the established industrial environment, and having regard to the limited scale, localised extent and temporary nature of the works, the cumulative construction-phase effects of the Proposed Development in combination with the Edenderry Renewable Energy Complex development on land, soils and the geological environment are assessed as ***neutral, imperceptible***, and ***short term.***

17.7.1.2 Other Existing / Permitted Development(s)

The Rinawade – Dunfirth Tee – Kinnegad 110 kV overhead line and Water Supply Project – Eastern and Midlands Region projects comprise linear infrastructure developments, with construction activities that may take place within shared or corridors and which, based on published programme information, may overlap temporally with the construction phase of the Proposed Development.

The potential for cumulative impacts on the geological environment in respect of the Proposed Development and the other existing / permitted developments during a simultaneous construction phase would be as a result of, those key engineering works including:

- Control of soil excavation and export from site;
- Sources of fill and aggregates for the Proposed Development;
- Accidental spillages and leakage from construction traffic and construction materials may occur, which could result in localised contamination of soils and groundwater underlying the site; and
- The removal of topsoil and subsoil cover during construction, which will further increase the vulnerability of the underlying bedrock.

The implementation of mitigation and monitoring measures detailed in Sections 5.6 and 5.7 of Chapter 5, together with compliance by the permitted developments with their respective planning conditions, will ensure minimal cumulative change to land, soils, and the geological environment during the construction phase of the Proposed Development. Contractors for the Proposed Development will be contractually required to operate in compliance with the CEMP which includes the mitigation measures outlined in this EIAR. The works contractors for other planned or permitted developments will be obliged to ensure that measures are in place to protect soil and water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and S.I. 266 of 2016).

Any future development will be required to incorporate appropriate mitigation measures (e.g. management of water quality in run-off water, landscape, etc) during the construction phase.

While there is potential for cumulative impacts between the Proposed Development and other existing or permitted developments during simultaneous construction phases, the likely cumulative impact on land, soils, and geology is considered ***negative, imperceptible,*** and ***temporary.***

17.7.2 Operational Phase

17.7.2.1 Related Development

There are no direct outward emissions associated with the Proposed Development once constructed. The gas transmission pipeline will be fully buried underground and, as such, will not give rise to operational impacts on land, soils or geology.

Above Ground Installation (AGI) and the Kilwarden Offtake Installation, as well as minor combustion emissions from small-scale gas-fired plant and backup generators. In addition, there is a low-risk potential for accidental spillages of fuels or oils during infrequent inspection and maintenance activities. However, these operational elements are fully contained within designed infrastructure and managed systems. Stormwater from the AGI is conveyed via the existing surface water drainage network within the Renewable Energy Complex, while surface water at the Kilwarden Offtake Installation is managed via on-site soakaway infrastructure. These systems are designed and operated to prevent uncontrolled discharges to land or soils. Fuel and oils associated with plant and maintenance activities are stored, handled and managed in accordance with standard operational controls and pollution prevention procedures.

The gas pipeline itself comprises a buried underground gas transmission pipeline which does not require routine ground disturbance during operation.

The related development does not introduce new operational processes that would result in ongoing soil disturbance or contamination pathways beyond those already licensed and managed at the Renewable Energy Complex.

The operational-phase cumulative effect of the Proposed Development in combination with the related developments, with respect to land, soils and geology, is assessed as ***neutral, imperceptible and long term.***

17.7.2.2 Other Existing / Permitted Development(s)

Operational activities associated with existing or permitted developments in the surrounding area may include stormwater management systems, plant operation and infrequent maintenance-related activities with associated emissions or spill risks. However, these activities are subject to their own regulatory controls, design standards and operational management systems and do not interact with land, soils or geology in combination with the Proposed Development.

Once constructed, the gas pipeline will be fully underground and will not generate operational soil disturbance, emissions to ground, or pathways for contamination of land, soils or geological resources. While there is a low-probability risk of localised spills associated with maintenance activities at associated infrastructure, these are managed through standard operational procedures and would not give rise to cumulative effects with other developments.

Other existing and/or permitted developments, including the EirGrid 110 kV line upgrade and the Water Supply Project, may also involve operational infrastructure and managed systems; however, these are subject to their own regulatory and operational controls and do not give rise to interaction pathways with land, soils or geology in combination with the Proposed Development.

The operational-phase cumulative effect of the Proposed Development in combination with other existing or permitted developments, with respect to land, soils and geology, is therefore assessed as ***neutral, imperceptible and long term.***

17.8 Hydrology and Hydrogeology

17.8.1 Construction phase

17.8.1.1 Related Development

The Edenderry Renewable Energy Complex is an established industrial site where the hydrological environment has been extensively modified by existing development, including permanent hardstanding, foundations, underground services and engineered drainage infrastructure. As a result, surface water runoff is already managed within a controlled drainage system and directed towards a single receiving waterbody, the River Figile**.**

During the construction phase, the Proposed Development may overlap temporally with construction activities associated with the related development within the Renewable Energy Complex. In relation to the potential cumulative impact on hydrology and hydrogeology during the construction phase, the construction works which would have potential cumulative impacts are as follows:

- Surface water run-off during the construction phase may contain increased silt levels or become polluted from construction activities. Run-off containing large amounts of silt can cause damage to surface water systems and receiving watercourses.

- Stockpiled material will be stored away from surface water drains, and gullies will be protected during works to ensure there is no discharge of silt-laden water into the surrounding surface water drainage or to ground.
- Contamination of surface water and groundwater from accidental spillage and leakage from construction traffic and construction materials is possible unless project-specific measures are put in place for each development and complied with.

Construction of the Proposed Development will be subject to a Construction Environmental Management Plan (CEMP), incorporating standard best-practice measures for sediment control, spill prevention and containment, and construction water management. These measures, together with the established drainage controls already operating within the Renewable Energy Complex, will ensure that construction-phase runoff and accidental discharges are effectively managed prior to discharge to the River Figile.

The mitigation measures set out in Chapter 6 (Mitigation Measures) in Section 6.6 and monitoring/reinstatement measures in Section 6.7, provides bestpractice procedures for sediment control, treatment of construction water.

The works contractors will also be obliged to ensure that measures are in place to protect soil and water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 as amended by S.I. 366 of 2016 and by S.I. 287 of 2022), and water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and S.I. 266 of 2016).

The residual cumulative impact of the Proposed Development in combination with other planned or permitted developments can therefore be considered to be ***neutral, imperceptible***, and ***short-term***.

17.8.1.2 Other Existing / Permitted Development(s)

Other existing and permitted developments identified include linear infrastructure projects which intersect or pass in close proximity to the Proposed Development, notably the Rinawade – Dunfirth Tee – Kinnegad 110 kV overhead line upgrade in the vicinity of the Yellow River, and the Water Supply Project – Eastern and Midlands Region, which crosses the Proposed Development to the north of the Edenderry Power Station site.

Where construction phases overlap, cumulative effects on hydrology and hydrogeology may arise from concurrent earthworks and construction activities associated with multiple projects. As with the Proposed Development, the key potential cumulative mechanisms relate to:

- Surface water run-off during the construction phase may contain increased silt levels or become polluted from construction activities. Run-off containing large amounts of silt can cause damage to surface water systems and receiving watercourses.
- Stockpiled material will be stored away from surface water drains, and gullies will be protected during works to ensure there is no discharge of silt-laden water into the surrounding surface water drainage or to ground.
- Contamination of surface water and groundwater from accidental spillage and leakage from construction traffic and construction materials is possible unless project-specific measures are put in place for each development and complied with.

A Construction Environmental Management Plan (CEMP) (2026) is included with the application documentation. This, together with the mitigation measures set out in Section 6.6, outlines the best practice construction techniques and methodologies which will be implemented during construction of the Proposed Development to minimise potential for contamination.

The CEMP will be implemented and adhered to by the construction Contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager and Ecological Clerk of Works where relevant. All personnel working on the site will be trained in the implementation of the procedures.

The works contractors will also be obliged to ensure that measures are in place to protect soil and water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 as amended by S.I. 366 of 2016 and by S.I. 287 of 2022), and water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and S.I. 266 of 2016).

The residual cumulative impact of the Proposed Development in combination with other planned or permitted developments can therefore be considered to be ***neutral, imperceptible***, and ***short-term***.

17.8.2 Operational phase

17.8.2.1 Related Developments

During the operational phase, the Proposed Development primarily comprises buried infrastructure and does not alter existing surface water drainage patterns along the pipeline route. Within the Edenderry Renewable Energy Complex, operational hydrological interaction is limited to the Ballykilleen AGI.

Additional hardstanding at the Ballykilleen AGI will generate surface water runoff during rainfall events. Stormwater arising from this hardstanding will be captured and managed through the existing site drainage infrastructure. The pond is designed to regulate flow and provide settlement prior to discharge, with treated surface water released at a controlled rate to the River Figile.

Operational activities at the AGI may present a low-probability risk of minor accidental spills during infrequent inspection or maintenance activities. However, these risks are managed through established operational procedures and by the controlled surface water drainage and attenuation system, which provides separation between potential sources and the receiving environment.

The operational phase cumulative effect of the Proposed Development in combination with the related developments with regards to hydrology and hydrogeology is considered to be ***neutral, imperceptible,*** *and* ***long term.***

17.8.2.2 Other Existing / Permitted Development(s)

Other operational developments in the surrounding area may also generate surface water runoff from impermeable areas or involve routine maintenance activities with a low risk of accidental spills. However, such developments are subject to individual drainage designs and regulatory controls to protect surface water and groundwater quality.

For the Proposed Development, operational hydrological impacts remain limited in extent. The addition of minor areas of hardstanding does not alter the wider hydrological regime and results in only a negligible, localised reduction in infiltration. There is no plausible mechanism by which significant cumulative operational effects on hydrology or hydrogeology could arise.

There are no direct outward emissions associated with the Proposed Development once constructed. The gas transmission pipeline will be fully buried underground and, as such, will not give rise to operational impacts on land, soils or geology.

The operational phase cumulative effect of the Proposed Development in combination with other planned or permitted developments regards to hydrology and hydrogeology is considered to be ***neutral, imperceptible and long term.***

17.9 Biodiversity

17.9.1 Construction Phase

As part of the assessment of the Proposed Development, other developments currently permitted or under construction in the surrounding area of which potential effects in combination with those from the subject development of this EIAR may result in a significant effect(s) on biodiversity. The projects considered to have potential to result in cumulative impacts during the construction phase are listed in Appendix 2.3 of Chapter 2 of this EIAR.

17.9.1.1 Related Development

Conversion of existing 116 MW Cushaling Peaker Plant (potential future development)

The future Proposed Development is at a preliminary design stage and as such, the full extent of works, potential impacts, and the in-combination effects of the works with those of the subject development of this EIAR cannot be fully ascertained. However, the Edenderry Renewable Energy Complex comprises established industrial infrastructure and includes its own dedicated underground stormwater drainage network. Surface water runoff from the complex is attenuated on site prior to discharge to the Figile River in accordance with existing drainage arrangements, stormwater discharges are controlled under EPA Licence P0482-04.

The proposed Ballykilleen AGI will include a concrete standing area, internal access routes, and a site drainage system connected to the existing Edenderry Renewable Energy Complex stormwater drainage network, in line with agreement between GNI and Bord na Móna. This system will drain stormwater through the existing stormwater drainage network and discharge to the Figile River.

Based on the location, scale and nature of the three current options being explored for the Related Development, assuming works coincide with those associated with the proposed GNI 143 Ballykilleen Pipeline, the indirect nature of surface water discharge (under license) from the Related Development, and full implementation of all mitigation measures outlined within the EIAR, NIS and supporting documents in relation to biodiversity for the Proposed Development, in the absence of mitigation measures for the Related Development, it is not anticipated that significant cumulative impacts on Biodiversity would occur. Potential cumulative impacts are considered to be ***negligible-adverse, neutral, imperceptible, temporary***.

17.9.1.2 Other Existing / Permitted Development(s)

Eirgrid PLC application to Offaly County Council (OCC) to upgrade the existing Rinawade – Dunfirth Tee – Kinnegad 110kV overhead line (OCC Reg. Ref.: 2560500)

This permitted development intersects the subject Proposed Development of this EIAR between chainage points 11,350 m and 11,700 m. Due to the nature of the permitted development, limited interaction with the Proposed Development spatially and temporally, following of measures outlined in the conditions stipulated by OCC for the permitted development (CEMP, AA/NIS, Prevention of spillages and management of soil and Dust during construction, Management of surface water generated during operation; management of riparian zones, and Operational Waste Management, IPC Licence requirement, Article 27 utilisation, Resource and Waste Management Plan), and mitigation measures outlined within the EIAR, NIS and supporting documents in relation to biodiversity for the Proposed Development, it is not anticipated that significant cumulative impacts on Biodiversity would occur. Potential cumulative impacts are considered to be ***negligible-adverse, neutral, imperceptible, temporary***.

Water Supply Project Eastern and Midlands Region (An Coimisiún Pleanála (ACP) Reg. Ref.: 323980)

This submitted development intersects the subject Proposed Development of this EIAR between chainage points 22,500 m and 22,800 m. Based on the anticipated/proposed commencement/completion dates of these developments, there is the potential for concurrent works to be carried out simultaneously with overlapping Zones of Influence. Due to the nature of the submitted development, limited potential interaction with the Proposed Development spatially and temporally due to the extensive linear nature of both developments, and mitigation measures outlined within the EIAR, NIS and supporting documents in relation to biodiversity for the Proposed Development, it is not anticipated that significant cumulative impacts on Biodiversity would occur. Potential cumulative impacts are considered to be ***negligible-adverse, neutral, imperceptible, temporary***.

Ballydermot Windfarm Project (potential future development)

This potential future development would be located greater than 2 km from the Proposed Development, and would be considered to overlap in their Zones of Influence. It should be noted that the Potential Future Development is not currently in the planning system and as such cannot be considered for potential cumulative impacts on biodiversity with the Proposed Development. However, considering the potential for impacts during construction and operation of the Proposed Development both in the absence and presence of mitigation measures, the limited overlap in surface water catchments between the developments, the likelihood and potential duration of direct construction overlap given the linear nature of and proposed construction methodology of the Proposed Development, and mitigation measures outlined within the EIAR, NIS and supporting documents in relation to biodiversity for the Proposed Development, it is not anticipated that significant cumulative impacts on Biodiversity would occur. In the event of direct overlap in peak construction activity, potential cumulative impacts are considered to be ***low-adverse, not significant, temporary***.

17.9.2 Operational Phase

17.9.2.1 Related Development

Conversion of existing 116 MW Cushaling Peaker Plant (potential future development)

The future Proposed Development is at a preliminary design stage and as such, the full extent of operations, potential impacts, and the in-combination effects of the works with those of the subject development of this EIAR cannot be fully ascertained. However, the Edenderry Renewable Energy Complex comprises established industrial infrastructure and includes its own dedicated underground stormwater drainage network. Surface water runoff from the complex is attenuated on site prior to discharge to the Figile River in accordance with existing drainage arrangements, stormwater discharges are controlled under EPA Licence P0482-04.

The proposed Ballykilleen AGI will include a concrete standing area, internal access routes, and a site drainage system connected to the existing Edenderry Renewable Energy Complex stormwater drainage network, in line with agreement between GNI and Bord na Móna. This system will drain stormwater through the existing stormwater drainage network and discharge to the Figile River.

Based on the location, scale and nature of the three current options being explored for the Related Development, the indirect nature of surface water discharge (under license) from the Related Development, passive nature of the Proposed Development, in the absence of mitigation measures for the Related Development, and potential scope and scale for future repair/maintenance works, it is not anticipated that significant cumulative impacts on Biodiversity would occur. Potential cumulative impacts are considered to be ***negligible-adverse, neutral, imperceptible, long-term***.

17.9.2.2 Other Existing / Permitted Development(s)

Eirgrid PLC application to Offaly County Council (OCC) to upgrade the existing Rinawade – Dunfirth Tee – Kinnegad 110kV overhead line (OCC Reg. Ref.: 2560500)

This permitted development intersects the subject Proposed Development of this EIAR between chainage points 11,350 m and 11,700 m. Due to the nature of the permitted development, limited interaction with the Proposed Development spatially and temporally, generally passive nature of both developments, and potential scope and scale for future repair/maintenance works, it is not anticipated that significant cumulative impacts on Biodiversity would occur. Potential cumulative impacts are considered to be ***negligible-adverse, neutral, imperceptible, long-term***.

Water Supply Project Eastern and Midlands Region (An Coimisiún Pleanála (ACP) Reg. Ref.: 323980)

This submitted development intersects the subject Proposed Development of this EIAR between chainage points 22,500 m and 22,800 m. Due to the nature of the submitted development, limited interaction with the Proposed Development spatially and temporally due to the extensive linear nature of both developments, potential scope and scale for future repair/maintenance works, and passive nature of both developments, it is not anticipated that significant cumulative impacts on Biodiversity would occur. Potential cumulative impacts are considered to be ***negligible-adverse, neutral, imperceptible, long-term***.

Ballydermot Windfarm Project (potential future development)

This potential future development would be located greater than 2 km from the Proposed Development and their Zones of Influence would be considered to overlap. It should be noted that the Potential Future Development is not currently in the planning system and as such cannot be fully considered for potential cumulative impacts on biodiversity with the Proposed Development. However, considering the limited overlap in surface water catchments between the developments, the potential scope and scale for future repair/maintenance works at both developments, and the passive operational nature of the Proposed Development, it is not anticipated that significant cumulative impacts on Biodiversity would occur during operation. In the event of direct overlap in peak construction activity, potential cumulative impacts are considered to be ***negligible-adverse, neutral, not significant, long-term***.

Based on the location, scale and nature of the projects assessed and full implementation of all mitigation measures outlined within the EIAR, NIS and supporting documents in relation to biodiversity for the Proposed Development, it is not anticipated that significant cumulative impacts on Biodiversity would occur. Potential cumulative impacts are considered to be ***negligible-adverse, neutral, imperceptible, temporary***.

17.10 Air Quality

17.10.1 Construction phase

17.10.1.1 Related Development

The conversion of the existing Cushaling Peaker Plants to dual-fuel operation involves upgrading two peaker units, each containing two engines, to operate on both distillate and natural gas. From the Ballykilleen AGI, a dedicated pipeline will link to the peaker units. Within the plant, four gas metering skids, one per engine, will be installed along with associated gas piping, instrumentation, and control integration. Additional modifications include enhancements to fire protection systems with gas detection and valve control, and commissioning of dual-fuel components to support flexible and secure operation.

Dust mitigation measures outlined in Section 8.6.1 of Chapter 8 will be implemented during the construction phase, with these mitigations in place no significant cumulative dust impacts with the related development is predicted. This applies to dust soiling, human health and ecological impacts from dust.

17.10.1.2 Other Existing / Permitted Development(s)

According to the IAQM guidance (2024) should the construction phase of the Proposed Development coincide with the construction phase of any other developments within 500 m then there is the potential for cumulative construction dust related impacts to nearby sensitive receptors. Nearby developments with the potential for cumulative construction phases include:

- Kilrainy and Kilrathmurry townlands, Clonard, Co. Kildare - Quarry development and associated processing (Ref. 2360266);
- Brackagh townland, Carbury, Co. Kildare - Sand and gravel extraction (dry working), associated processing plant and upgrade works (Ref. 201409);
- Townlands of Ballykilleen, Cloncreen and Ballinowlart North, Co. Offaly - 110kV Air Insulated Switchgear (AIS) Loop Substation with 400 m long overhead line grid connection and all associated site works (Ref. ABP-309686);
- Ballykilleen, Shean, Kilcumber, Cloncant, Cushaling, and Rathmore, Edenderry, and Ballina, Geashill, Co. Offaly, and Ticknevin, Carbury, Co. Kildare - up to nine wind turbines — eight located in County Offaly and one in County Kildare — each with a maximum tip height of 187 metres. The development will include all necessary foundations and hardstanding areas. Approximately 4,750 metres of new internal access roads will be constructed, along with associated drainage and turning areas (Ref. 19524);
- Ballykilleen, Shean, Kilcumber and Ballinowlart North, Co. Offaly - The Development Of approximately 970 m of new internal access roads for the permitted Cushaling Wind Farm (Ref. 22494);
- Ballinowlart North, Ballykillen, Kilcumber, Cloncant, and Cushaling, Edenderry, County Offaly - solar PV development with a total site area of approximately 117.47 hectares. The development will include PV panels mounted on metal frames, new access tracks, underground cabling, perimeter fencing with CCTV cameras, 22 medium-voltage (MV) power stations, temporary construction compounds, and all ancillary grid infrastructure and associated works (Ref. 21598);
- Ballykilleen, Kilcumber, Cloncant, Ballydermot, Clonmel, Clonbrown, Clonroosk Little, Clonroosk Big, Coolygagan, Clonbrock Upper, Kilcloncorkry, Kilnantoge Lower, Kilnantoge Upper and Shean., Co. Offaly - works associated with the proposed uprate of the existing 110 kV Overhead Line (OHL) between the existing Cushaling 110 kV substation in the townland of Ballykilleen, Co. Offaly and the existing Portlaoise 110 kV substation in the townlands of Clonminam and Kylekiproe, Co. Laois (Ref. 2560087);
- Ballykilleen, Edenderry, Co. Offaly - the continued operation of Edenderry Power Plant from the beginning of 2024 to the end of 2030 exclusively using sustainable biomass fuel. The applicant proposes to increase the volume of biomass consumed at the facility from a current maximum of 300,000 to 530,000 tonnes per annum (Ref. 21291).

With the implementation of mitigation measures outlined in Section 8.6.1 of Chapter 8 throughout the construction phase of the Proposed Development, significant cumulative dust impacts are not predicted.

17.10.2 Operational phase

17.10.2.1.1 Related Development

Bord na Móna (BnM) are planning to convert the existing diesel-powered peaking plant, at its Renewable Energy Complex, located just south of Edenderry, Co. Offaly, to natural gas turbines to reduce carbon dioxide (CO_2) emissions.

In order to reduce the risk to human health and the environment 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" (AQS) are health or environmental-based levels for which additional factors may be considered. The ambient air quality limit values for pollutants are set out in *Annex I* of *Directive (EU) 2024/2881.*

The AGI associated with the Proposed Development will include a small gas-fired boilers and a gas-fired generator, each with a thermal input of less than 1 MW. These units are not subject to IE licensing and will be operated intermittently, primarily for plant operational support and emergency use.

Given their small scale, low operating hours and use of natural gas as a fuel, emissions from the boiler and generator will be minor when compared with emissions from the existing licensed gas turbines. These units are not expected to result in any measurable deterioration in ambient air quality or exceedance of applicable air quality standards.

Air quality has the potential to be impacted through pollutant emissions from the on-site gas turbines. The facility currently holds an Industrial Emission (IE) Licence from the Environmental Protection Agency (IE Licence Reg. No. P0482-04). This assessment relates to the plant activity at the site under the current licence (ref. P0482-04). The IE licence for the facility sets out a number of emission limit values for the main emission points on site, the gas turbines being emission points A2-1, A2-2, A2-3 and A2-4. These emission limit values are in place to reduce negative impacts to ambient air quality. Table 17-1 shows the emission limit values for emissions to air as stated in the IE licence.

Table 17-1 Emission Limits in Licence

Emission Point	Parameter	Emission Limit Value (mg/m^3)
A1-1 (Main Boiler)	Oxides of sulphur	600
	Nitrogen oxides (as NO_2)	325
	Dust	50
A2-1, A2-2, A2-3, A2-4	Nitrogen oxides (as NO_2)	120
	Dust	20

Currently, the plant is licenced to operate using gas oil as its primary fuel. The total quantity of gas oil used during operation in 2024 was 2,102.7 tonnes. All gas oil will be replaced by natural gas. There will be no change to either emission points or stack placement. Although there are currently no proposed changes to the licence, as set out in *566/2012 - European Union (Large Combustion Plants) Regulations 2012*, Schedule 2 Section 6, the emission limit value for NO_x for turbines operating using natural gas is $50mg/m^3$, lower than the current 120 mg/m^3 limit values for A2-1, A2-2, A2-3 and A2-4 in the current IE licence.

During combustion, natural gas releases significantly less nitrogen oxides (NO_x), sulphur dioxide (SO_2) and particulate matter (PM) (both PM less than 10 microns and PM less than 2.5 microns known as PM_{10} and $PM_{2.5}$) than the currently licenced liquid fuel. Therefore, it is expected that the change in fuel source will result in a reduction in NO_x, SO_2, PM_{10} and $PM_{2.5}$.

The site is currently in compliance with the emission limit values set out in the IE licence. The site will be required to amend its IE licence to include updated emission limit values for the turbines when operating using natural gas, which will be lower than the current limit values. Therefore, the change in fuel source for the site will not result in increased air emissions in comparison to the existing emissions. The operational air quality effects of the change in fuel source are predicted to be ***long-term***, ***direct***, ***localised***, ***positive*** and ***significant***.

17.10.2.1.2 Other Existing / Permitted Development(s)

There are no significant direct emissions associated with Proposed Development once constructed, there are no potential operational impacts associated with this aspect of the development on air quality.

Cumulative traffic emissions from site maintenance vehicles and vehicles associated with permitted developments have the potential to impact air quality during the operational phase. However, as the number of vehicles required for maintenance activities is low and infrequent, cumulative impacts are considered ***neutral, imperceptible*** and ***long-term.***

The operational phase cumulative effect of the Proposed Development in combination with other planned or permitted developments regards to air quality is considered to be ***neutral, imperceptible,*** *and* ***long term.***

17.11 Climate

17.11.1 Related Developments

The Proposed Development represents the physical infrastructure necessary to connect the end-user facility – the Cushaling Peaker Plant – to the gas network. This project is the related development to the gas pipeline however while Gas Networks Ireland (GNI) is the Applicant for the proposed gas pipeline infrastructure, GNI does not own or operate the Cushaling Peaker Plant within the Edenderry Power Station that will combust the natural gas supplied by the pipeline.

The primary greenhouse gas emissions associated with the cumulative operation of the Proposed Development will occur during the operational stage with the independently operated electricity power generation installation.

In order to quantify the GHG emissions associated with the Cushaling Peaker Plant data was provided by the end-user facility operators.

The facility holds an Industrial Emissions Directive (IED) licence from the Environmental Protection Agency (EPA) (IE Licence Reg. No. P0482-04). The facility is currently licenced to operate using gas oil as its primary fuel source. The facility operates as a peaking unit, and therefore, is not required to operate continuously, operational hours vary with demand throughout the year. The total number of operational hours as well as the quantity of gas oil used and power generated annually over the previous 5 years, 2020 – 2024, are outlined in Table 17-2.

Table 17-2 Operational Data for Facility using Gas Oil

Year	Estimated Hours of Operation	Actual Gas Oil Consumption (tonnes)	Power Generation (MWh)
2020	137	2102.7	7960.3
2021	33	429.75	1898.1
2022	527	2297.22	30570.8
2023	395	5810.9	22928.5
2024	147	2236.54	8500.8

For the purposes of this assessment the following formula has been applied in order to calculate the tonnes of CO_2 emitted by the plant when operating using gas oil and natural gas:

$$\text{Emissions (kg CO}_2\text{)} = \frac{\text{Electricity output (kWh}_e\text{)}}{\text{Net electrical efficiency (\%)}} \times \text{SEAI Emissions Factor } \left(\frac{\text{kgCO}^2}{\text{kWh}}\text{fuel}\right)$$

The peaker plant has an overall potential power output of 116 MW_e, this is estimated to remain relatively similar when operating using natural gas. The overall electrical efficiency of the peaker units is c.35% when operating on either gas oil or natural gas.

The assessment has used the emission factors for gas oil and natural gas as published by the Sustainable Energy Authority of Ireland (SEAI)[7]. A figure of 0.2639 $kgCO_2/kWh$ was used for gas oil and a figure of 0.2035 $kgCO_2/kWh$ was used for natural gas.

In order to ensure the assessment remained conservative, the maximum operational hours for the plant over the 5-year period (2020 – 2024) have been used in the assessment, i.e. 527 hours (see Table 17-2 above). This has been used to compare emissions when operating using gas oil and natural gas to ensure consistency in the approach.

Based on 527 hours of operation and 116 MW_e a figure of 61,132,000 kWh_e has been used in the assessment. Table 17-3 below details the predicted tonnes of CO_2 emitted for both the gas oil and natural gas scenarios.

Table 17-3 Estimated Tonnes CO_2 Emitted - Gas Oil vs Natural Gas

	GAS OIL		NATURAL GAS	
Electricity output	61,132,000	kWh	61,132,000	kWh
Electrical efficiency of turbines	35%	efficiency	35%	efficiency
SEAI Emission Factor	0.2639	$kgCO_2/kWh$	0.2035	$kgCO_2/kWh$
Quantity CO_2 emitted	46,093,528	$kgCO_2$	35,543,891	$kgCO_2$
	46,094	**tCO_2**	**35,544**	**tCO_2**

As can be seen in Table 17-3, emissions when operating using natural gas are predicted to be lower than when operating using gas oil. There is a potential reduction of 10,550 tCO_2 based on the above parameters. This figure will vary depending on the actual hours of operation, but overall, emissions of CO_2 when the plant is operating using natural gas will be lower than the current gas oil scenario. Additionally, the carbon intensity of natural gas will decrease in the future in line with integration of renewables such as biomethane.

The Electricity Sector has a 2030 carbon budget of 3 $MtCO_2e$. Emissions (as per Table 17-3) from the peaker plant when operating using gas oil are approximately 1.5% of the 2030 electricity sector budget. In comparison, emissions from the peaker plant when operating using natural gas (as per Table 17-3) are predicted to be 1.2% of the 2030 electricity sector budget.

17.11.1.1 Significance of Cumulative Emissions

The operation of the related development will give rise to greenhouse gas (GHG) emissions. These emissions are associated with combustion activities within a permitted energy facility, which will be fuelled by natural gas supplied via the proposed transmission pipeline.

The Institute of Sustainability and Environmental Professionals (ISEP), formerly the Institute of Environmental Management and Assessment (IEMA), guidance note on "*Assessing Greenhouse Gas Emissions and Evaluating their Significance – 2nd Edition*" (IEMA, 2022) states that:

[7] https://www.seai.ie/data-and-insights/seai-statistics/conversion-factors

"the crux of significance regarding impact on climate is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050".

The purpose of the proposed upgrade of the facility is to reduce CO_2 emissions from the Cushaling Peak Plant. As per the above assessment, the change in fuel type from gas oil to natural gas will result in reduced CO_2 emissions and an associated reduced climate impact.

The proposed pipeline development will facilitate the conversion to natural gas as the primary fuel for the facility thereby allowing for the transition to a lower carbon intensive fuel and the associated climate benefits. This directly aligns the facility with Ireland's 2050 Net-Zero trajectory.

In addition, the end-user facility operates under a Greenhouse Gas Emissions Permit pursuant to the European Communities (Greenhouse Gas Emissions Trading) Regulations 2012 (S.I. No. 490/2012, as amended). This permit will also be applicable to the upgraded facility. These permits require annual reporting and surrendering of allowances equivalent to all CO_2 emissions from combustion activities. The availability of allowances is reduced annually at the EU level, thus ensuring emissions decline across the sector.

Background on EU ETS

The end-user facility holds a Greenhouse Gas (GHG) Emissions Permit to operate and as such, the facility is part of the European Union Emissions Trading System (EU ETS).

The EU ETS is an EU-wide market-based scheme that regulates GHG emissions from large industrial emitters, including electricity generation, cement manufacturing, heavy industry, and any installation with a thermal input capacity exceeding 20 MW – which applies to this end-user facility.

On 14 July 2021, the European Commission adopted a series of legislative proposals setting out how it intends to achieve climate neutrality in the EU by 2050, including the intermediate target of at least a 55% net reduction in greenhouse gas emissions by 2030. The package of proposals is known as the 'Fit for 55' package.

The package includes revisions to the legislation put forward as part of the Climate and Energy Framework 2021-2030, including the EU Emissions Trading System (ETS), Effort Sharing Regulation, transport and land use legislation, setting out in real terms the ways in which the Commission intends to reach EU climate targets under the European Green Deal.

Under this new package of legislative proposals, the sectors of the economy covered by the current ETS must reduce emissions by 61% by 2030 compared to 2005 levels by increasing annual emissions reduction to 4.2% per annum. This is a substantial increase from the previous target which was a 43% reduction by 2030.

As outlined in European Commission publication "*Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment*" (EC, 2013) the context of global or EU-wide emissions, the GHG emissions associated with the end-user facility should be assessed in the context of the ETS. The approach that has been adopted at EU level is the EU Climate and Energy Package. In this regard, the EC guidance (EC, 2013) has stated that:

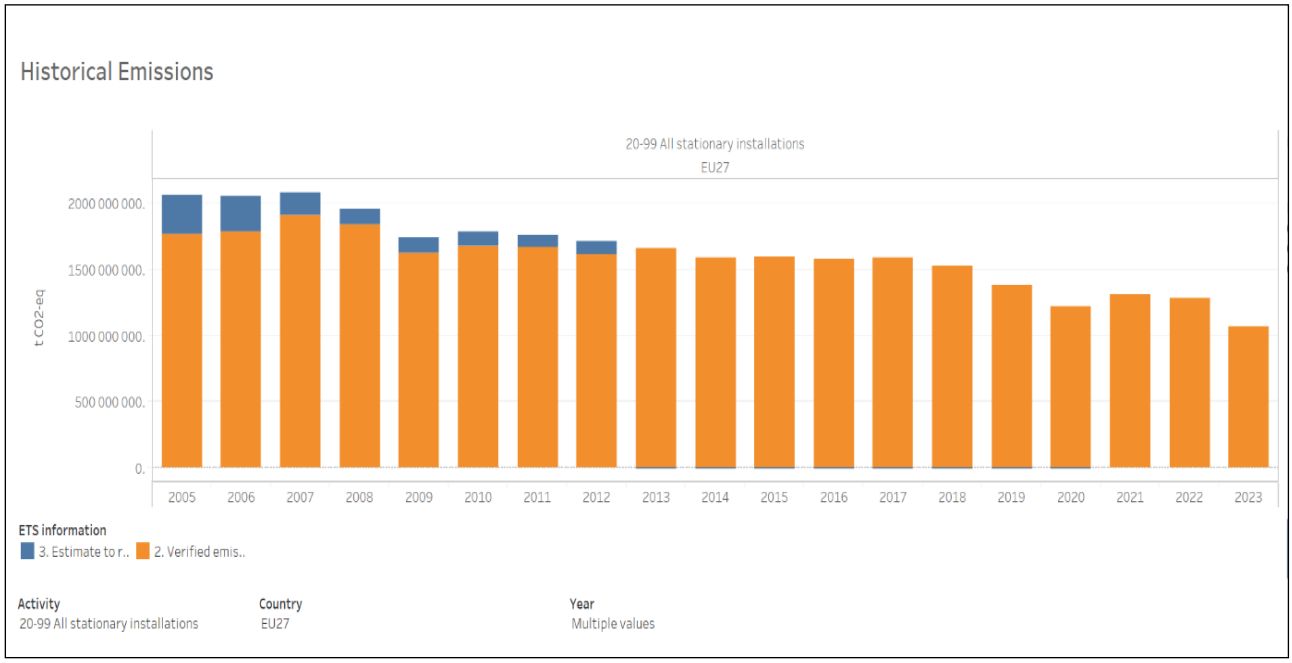
"The EU Emissions Trading System, the backbone of the EU mitigation effort, which sets a cap on emissions from the most polluting sectors including over 11,000 factories, power plants and other installations, including airlines. By 2020, the cap should result in a 21% reduction relative to 2005 levels. The EU ETS covers about 40% of all EU emissions." (EC, 2013).

As outlined in the EU publication "*The EU Emissions Trading System in 2020: trends and projections*" (EU, 2020), the European Union's energy system is decarbonising rapidly. The report states:

"*Total ETS emissions from stationary installations declined by 9.1% between 2018 and 2019, the largest drop in a decade, driven by a strong decrease in coal use for power production*" (EU, 2020)

As shown in Figure 17-6 in the most recent verified emissions from the ETS covering 2005 – 2023 this trend is continuing (with the exception of 2021 due to COVID impacts in 2020). On an EU-wide basis, the ETS market in 2023 was approximately 1,064 million tonnes CO_2e.

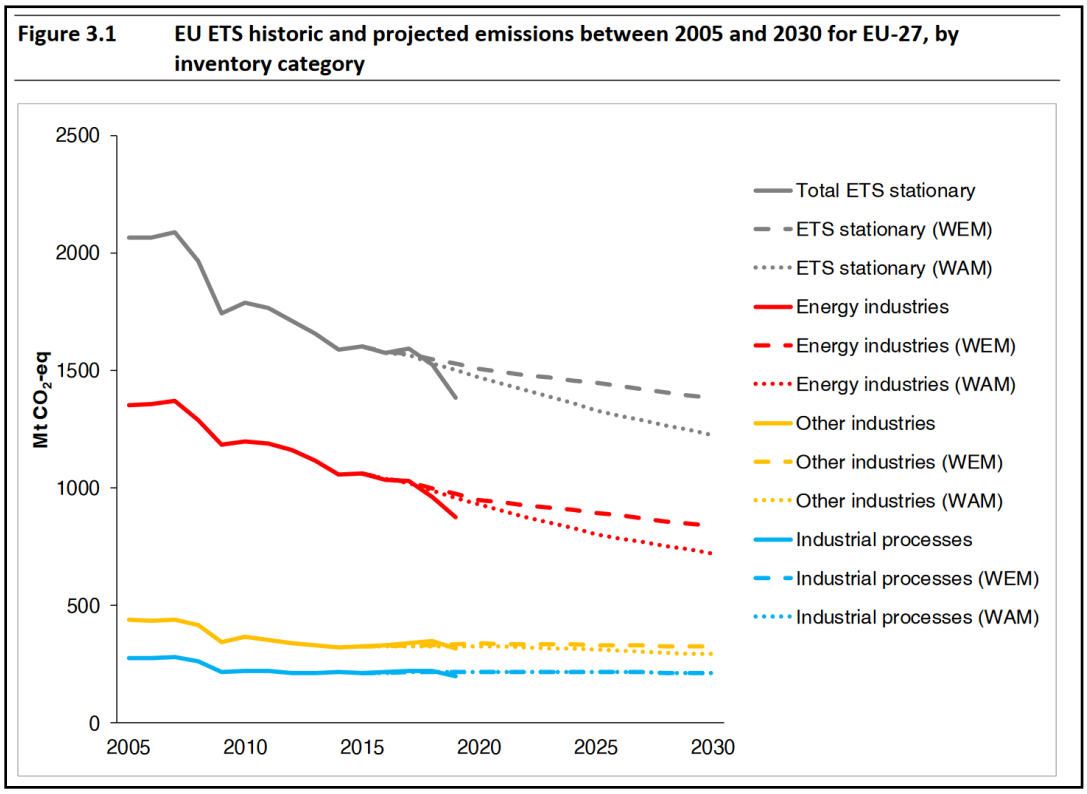
Figure 17-6 Historical ETS Verified Emissions 2005 - 2023



Taken from https://www.eea.europa.eu/data-and-maps/dashboards/e missions-trading-viewer-1

The European Topic Centre on Climate report entitled "*Trends and projections in the EU ETS in 2020*" (ETC, 2020) indicates that the reduction in GHG emissions is predicted to continue up to at least 2030 due to current policies in place. As shown in Figure 17-7 , both the energy industries and "other industries" are predicted to decrease significantly by 2030.

Figure 17-7 Historical ETS Verified Emissions & Project Emissions 2005 – 2030



Therefore, as the end-user facility is part of the EU ETS through their GHG Permit, this will further incentivise them towards decarbonisation.

17.11.1.2 Cumulative Effects Conclusion

The operation of the end-user facility will give rise to greenhouse gas (GHG) emissions. These emissions have been assessed in the context of the 2030 electricity sectoral ceiling and carbon budgets.

The GHG emissions from the end-user facility will be regulated through a GHG permit under the EU ETS. As outlined in European Commission 2013 publication *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment:*

"The EU Emissions Trading System, the backbone of the EU mitigation effort, which sets a cap on emissions from the most polluting sectors including over 11,000 factories, power plants and other installations, including airlines. By 2020, the cap should result in a 21% reduction relative to 2005 levels. The EU ETS covers about 40% of all EU emissions."

The EU ETS is decarbonising and current projections indicate that the reduction in GHG emissions is predicted to continue up to at least 2030 due to current policies in place.

The pipeline itself has a limited operational climate footprint. As the purpose of the pipeline is to safely transport gas and the pipeline itself has a limited climate footprint, it will not materially add to the operational emissions from the end-user.

The purpose of the proposed upgrade of the end-user facility is to reduce CO_2 emissions from the Cushaling Peak Plant. As per the above assessment, the change in fuel type from gas oil to natural gas will result in reduced CO_2 emissions and an associated reduced climate impact.

The proposed pipeline development will facilitate the conversion to natural gas as the primary fuel for the facility thereby allowing for the transition to a lower carbon intensive fuel and the associated climate benefits. This directly aligns the facility with Ireland's 2050 Net-Zero trajectory.

The cumulative operational phase effects of the change in fuel source are predicted to be ***long-term***, ***direct***, ***positive*** and ***not significant***.

17.11.2 Other Existing / Permitted Development(s)

With respect to the requirement for a cumulative assessment the ISEP (ISEP, 2022) and TII (TII, 2022a) guidance on which the assessment is based states that:

"*the identified receptor for the GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable. By presenting the GHG impact of a project in the context of its alignment to Ireland's trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland's ability to meet its national carbon reduction target. This assessment approach is considered to be inherently cumulative*".

As per the above, the cumulative impact of the Proposed Development and other wider projects in relation to GHG emissions is considered ***direct, long-term, positive*** and ***not significant***.

17.12 Noise and Vibration

17.12.1 Construction Phase

17.12.1.1 Related Development

Given that the nearest noise sensitive locations (NSLs) along the Proposed Development route are approximately 500 m from works associated with the conversion of the Cushaling Peaker Plant and provided the mitigation measures outlined in Section 10.6.1 are implemented throughout the construction phase of the Proposed Development, significant cumulative noise and vibration impacts are not predicted.

17.12.1.2 Other Existing / Permitted Development(s)

As the operational noise impact associated with the Proposed Development is ***neutral, imperceptible*** and ***long term***, there will be no cumulative noise or vibration effects associated with the Proposed Development.

17.12.2 Operational Phase

17.12.2.1 Related Development

Due to the significance in distance between all external developments listed above and the Proposed Development and provided the mitigation measures outlined in Section 10.6.1 are implemented throughout the construction phase of the Proposed Development, significant cumulative noise and vibration impacts are not predicted.

17.12.2.2 Other Existing / Permitted Development(s)

As the operational noise impact associated with the Proposed Development is ***neutral, imperceptible*** and ***long term***, there will be no cumulative noise or vibration effects associated with the Proposed Development.

17.13 Landscape and Visual

Cumulative landscape and visual impact assessment concerns additional changes to the landscape or visual amenity caused by a Proposed Development in conjunction with other developments (associated or separate from it), or actions that occurred in the past or present or are likely to occur in the foreseeable future. In this instance, cumulative effects have been subdivided into effects generated from related developments and effects generated in combination with other existing/permitted developments. Related developments in this instance include the conversion of the existing 116 MW Cushaling Peaker Plant located within the Edenderry Power Station whilst other existing/permitted developments considered include the following;

- upgrade works to the existing Rinawade – Dunfirth Tee – Kinnegad 110kV overhead line (Offaly County Council (OCC) Reg. Ref;
- the planned Ballydermot Windfarm, and;
- the proposed Water Supply Project Eastern and Midlands Region (An Coimisiún Pleanála (ACP) Reg. Ref.: 323980).

17.13.1 Construction Phase

17.13.1.1 Related Developments

With regard to cumulative construction stage effects arising in combination with other related developments, these principally relate to the Ballykilleen AGI component of the Proposed Development and the southernmost sections (Pipeline Section 6) of the proposed underground pipeline, as these represent the closest elements of the Proposed Development to the related development. The related development is wholly contained within the Edenderry Power Station complex, which is characterised by a highly anthropogenic built form and associated land uses. Consequently, the majority of construction phase activities, with the exception of HGV movements to and from the site, will take place within the established confines of the existing complex.

Whilst the proposed and related developments will result in an increase in construction activity intensity and/or an extension of the construction period, the potential for these activities to give rise to significant cumulative effects on landscape character and visual receptors is considered to be limited. Construction stage activities associated with the Proposed Development will be largely confined to their immediate environs, with both the proposed pipeline and AGI compound comprising elements of a relatively modest scale. Thus, it is deemed that the construction stage cumulative effects with related developments will be limited and are deemed ***not significant***.

17.13.1.2 Other Existing/Permitted Developments

In a similar manner to the related developments outlined above, the potential for notable cumulative construction stage effects arising from the Proposed Development is limited by its localised nature and relatively modest scale. Whilst the presence of other existing and permitted developments, if constructed concurrently, would result in an increased intensity of construction stage activity within the study area, the contribution of the Proposed Development to such cumulative effects is anticipated to be comparatively minor. This is attributable to the limited scale and extent of the Proposed Development and, in particular, the predominantly underground nature of the pipeline corridor, which would give rise to construction stage effects that are largely localised and temporary in nature. Thus, it is deemed that the construction stage cumulative effects with other existing/permitted developments will be limited and are deemed ***not significant***.

17.13.2 Operational Phase

17.13.2.1 Related Developments

As with potential cumulative construction stage effects in combination with related developments, the contribution of the Proposed Development to any notable change in the character of the surrounding landscape at the operational stage is limited. This is primarily due to the proposed AGI being fully contained within the established confines of the Edenderry Power Station complex, which itself represents a prominent and modified land use within the surrounding landscape context.

The proposed pipeline will give rise to negligible operational landscape effects, as it will be fully reinstated following construction, with a post-and-wire fence along the pipeline corridor constituting the only discernible above-ground element of the Proposed Development. In addition, the proposed AGI will present with a very limited degree of visual exposure within the surrounding landscape. Partial views of the built elements will be available from the adjacent regional road; however, these views will occur within an existing context of prominent built development associated with the Edenderry Power Station and adjoining substations.

In this context, the Proposed Development has the potential to contribute to only a very modest and highly localised level of cumulative visual effects. Thus, cumulative operational landscape and visual effects arising in combination with related developments are assessed as ***not significant***.

17.13.2.2 Other Existing/Permitted Developments

As noted above, the only above-ground elements associated with the Proposed Development comprise the permanent Kilwarden Offtake Installation and the Ballykilleen AGI. The proposed pipeline will have little discernible presence within the surrounding landscape at the operational stage, as it will be fully reinstated following construction, with a post-and-wire fence along the pipeline corridor representing the sole above-ground feature.

In this context, the Proposed Development will make a very modest contribution to cumulative operational effects when considered in combination with other existing and permitted developments. The other developments assessed generally comprise more prominent built forms, with the exception of the Water Supply Project, which similarly consists largely of an underground pipeline. Consequently, the principal cumulative effect associated with the Proposed Development relates to a limited increase in the intensity of built development within the surrounding landscape. This does not represent an intensification of development that would materially or significantly alter the character of the surrounding landscape, which is already influenced by a range of highly anthropogenic built forms and land uses. Thus, cumulative operational phase effects with regard to other existing/permitted developments are assessed as ***not significant***.

17.14 Archaeological, Architectural and Cultural Heritage

17.14.1 Construction phase

17.14.1.1 Related Development

There have been twelve licensed archaeological investigations within the study area, from 2002 to 2017 relating to small scale development works. Archaeological features were identified in eight of these. Should any sub-surface features exist that will be potentially impacted on by the Proposed Development, they will be archaeologically recorded in advance of construction works in these areas, in consultation with and under license to the National Monuments Service of the Department of Housing, Local Government and Heritage.

While the Proposed Development traverses areas of elevated archaeological potential, including watercourses, townland boundaries and five identified Arears of Archaeological Potential, the potential for cumulative impacts with related developments is limited. Mitigation measures are recommended in Chapter 11, Section 11.6 (Mitigation Measures) to address any potential impact on archaeological, cultural, or architectural heritage. With these measures in place, there will be no residual impacts on archaeology and cultural heritage associated with the construction phase of the Proposed Development.

Where related developments require ground disturbance to land that has not been developed in recent times, the planning process will require mitigation measures are undertaken comprising geophysics and / or archaeological testing and / or archaeological monitoring under license from the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht.

The Proposed Development will not alter the predicted construction-phase effects of the related developments; therefore, the conclusions of their EIARs remain unchanged. Consequently, the cumulative construction-phase effect of the Proposed Development in combination with the related developments on archaeology and cultural heritage is considered ***neutral, not significant,*** and ***permanent.***

17.14.1.2 Other Existing / Permitted Development(s)

Archaeological, architectural and cultural heritage impacts arise solely from direct ground disturbance within the footprint of a development and do not involve emissions, pathways or zones of influence extending beyond the site boundary. As such, there is no mechanism by which the Proposed Development could interact cumulatively with other existing or permitted developments in respect of archaeological or cultural heritage.

All existing and permitted developments within the wider area have been, or will be, subject to individual archaeological assessment, licensing and mitigation measures under the statutory control of the National Monuments Service. Any archaeological remains encountered during construction would be addressed through preservation by record in accordance with licensing requirements and would not give rise to residual adverse effects.

Given the site-specific nature of archaeological impacts, the absence of any shared impact pathways, and the statutory controls governing all development-related ground disturbance, the consideration of cumulative impacts between the Proposed Development and other unrelated existing or permitted developments is not applicable. Accordingly, there is no potential for cumulative impacts with other existing and permitted development on archaeological, architectural or cultural heritage during the construction phase.

17.14.2 Operational phase

17.14.2.1 Related Development

There is no potential impact on archaeological, architectural and cultural heritage expected as a result of the operational phase of the Proposed Development.

17.14.2.2 Other Existing / Permitted Development(s)

There is no potential impact on archaeological, architectural and cultural heritage expected as a result of the operational phase of the Proposed Development. Therefore, there is no cumulative impact.

17.15 Material Assets - Traffic and Transportation

17.15.1 Construction Phase

17.15.1.1 Related Development

The potential cumulative impact on traffic and transportation during the construction phases are those key works which could result in cumulative impact if not adequately mitigated arise from additional trips due to the works associated with the related project.

Works associated with the conversion of the existing distillate fired power station to gas at the Edenderry Renewable Energy Complex will include laying short length of pipeline internal to the site, and some new plant equipment being installed to change the burners from liquid to gas. A nominal amount of traffic would be associated with this work c.10 vehicles per day over a two-week period.

Potential cumulative adverse traffic effects may occur along the R401 south of Edenderry during the construction phase of the Proposed Development. These impacts could arise in combination with construction activities associated with the conversion proposals. The potential for significant cumulative effects is between the Proposed Development, and the Conversion proposal is sufficiently reduced to imperceptible by the construction-phase mitigation measures proposed within this EIAR, including the requirement for the related development to adhere to a Construction Environmental Management Plan.

The combined impact with the development would be negligible from a transportation perspective having ***neutral, negligible and temporary effects.***

The additional traffic will have a temporary negligible impact on the local network. Construction works for the gas pipeline will be carried out in a linear manner predominantly over farmland. Works within the carriageway associated with open trench crossings will result in localised delays due to traffic management and diversions. Based on the assessment of the network links there will be moderate effects on the receiving traffic and transportation environments. The need for diversion for the R401 road crossing (RDX17) would be the only element of the Proposed Development that would impact the traffic accessing the Renewable Energy Complex.

This situation would occur over a short period of the overall programme of works and would therefore be temporary in nature. The cumulative impact for the affected roads making up the local network will be of ***negative, moderate***, and ***temporary*** effects.

17.15.1.2 Other Existing / Permitted Development(s)

Other significant developments have been identified and their relative impact reviewed from the planning information submitted in support of those developments. A review of the existing projects within the vicinity of the site and the projects set out in Section 17.4 has identified a number of projects that at a worst case, may have a simultaneous construction phase capable of combining with the Proposed Development. Other projects identified in Appendix 2.3 were assessed as having minimal associated traffic impact or already included in the background traffic survey information.

Table 17-4 Other Projects

Project	Timeline	Construction Traffic	Comments
Rinawade – Dunfirth Tee – Kinnegad 110kV overhead line (OCC) Reg. Ref.: 2560500	03/2027-11/2027	40 LV trips per day 12 HV trips per day	Project is not expected to be concurrent with the Proposed Development works therefore there would not be a cumulative impact

Water Supply Project Eastern and Midlands Region ACP) Reg. Ref.: 323980	Relevant works reference *AE028* Q3 2029- Q4 2031	68 LV/car trips per day 6 shuttle bus trips per day 108 HV trips per day	Works may be coincident with Proposed Development works
Ballydermot Windfarm (planned)	Unknown	Unknown	Access would be via the Cushaling Wind Farm access off R401 and the number of trips would not be anticipated to be significant and could be accounted for in background traffic growth

From the above table only the Water Supply project would be expected to have a measurable cumulative impact. The roads impacted due to a cumulative impact are assessed in Table 17-5 and Table 17-6 below. For simplicity the grown 2028 traffic flows have been used in the assessment. The assessment set out in Table 17-5 in accordance with TII document DN-GEO_030301 Road Link Design.

Table 17-5 Rural Road Flow to Capacity

Road	2028 AADT	Construction trips	Total	% increase	Capacity Level of Service D (AADT)	Percentage Capacity (Do Nothing)	Percentage Capacity (Do Something)
R401	3,003	302	3305	10.1%	5000	60.1%	66.1%

For the urban section of road, it is more appropriate to use Highways England's TA 79/99 Traffic Capacity of Urban Roads to assess the relative flow to capacity for the roads. The relative capacity is assessed based on the hourly flows. The assessment is set out in Table Table 17-6.

Table 17-6 Urban Road Flow to Capacity

Road	2028 Maximum Hourly Flow	Construction Trips (Peak Hour)	Total	% Increase	Busiest Direction Flow Capacity	Percentage Capacity (Do Nothing)	Percentage Capacity (Do Something)
R402 urban	1,092	40	1112	3.7%	1140	95.8%	97.5%

The proportional additional trips on the R401 are reasonably moderate relative to the existing flow there is significant residual capacity for the latter carriageway. The R402 south of Edenderry is already operating slightly below capacity, but the additional traffic generated by the development is low overall. The impact of the construction trips relative to the Service Level D for the carriageway cross sections as set out in DN-GEO_030301 Road Link Design and TA 79/99 Traffic Capacity of Urban Roads show that the additional construction trips will have negligible impact on the carriageway capacity.

The increase in traffic during the construction phase on the existing road has the potential for a ***neutral, not significant and temporary effects*** (Effects lasting less than a year) on the existing road network***.***

As the works associated with the gas and water pipeline works will require trenching and reinstatement at the crossing of the R401 there will be a need to carry out the works under traffic management road closure with associated diversions. This will impact local traffic to the road crossing through disruption and longer journeys at diversions. These works will be carried out over only part of the overlapping time frame required for this part of the works, typically in the order of five days and would therefore be temporary in nature.

Based on the assessment of the network links there will be moderate effect on the receiving traffic and transportation environments. The need for diversions would be restricted where works necessitate occupation of the carriageway. The cumulative impact for the affected R401 making up the local network will be of ***negative, moderate,*** and ***temporary*** effects.

17.15.2 Operational Phase

17.15.2.1 Related Development

As there will be a small amount of intermittent operational traffic generated by the pipeline, the conclusions of the residual impact for the related project would also be applicable in a cumulative context.

As the operational phase would generate less traffic than the construction phase it would be expected that the impact on the local transportation environment would be lower. Therefore, the cumulative impact of the operational phase would be concluded to be ***long term neutral*** and ***imperceptible***.

17.15.2.2 Other Existing / Permitted Development(s)

The operational phase cumulative impact of the Proposed Development, as the number of vehicles required for maintenance activities for the Proposed Development is low, in combination with other planned or potentially permitted developments with regards to traffic and transportation can therefore be considered to be ***neutral, imperceptible,*** and ***long-term***.

17.16 Material Assets - Utilities

17.16.1 Construction phase

17.16.1.1 Related Development

The Proposed Development entails minimal use of material assets during construction. Coordination and consultation should take place between the project team and third-party utility providers, and other relevant service providers as the design and construction progresses. The location of the Proposed Development has limited access to existing utilities; however, confirmation from utility suppliers indicates that the Proposed Development and related developments will not impact capacity for off-site development.

The works contractor is obliged to implement best practice measures to ensure there are no interruptions to services such as telecommunications, water mains, sewer, and the electrical grid. Any planned interruptions will be agreed in advance with the relevant utility providers.

As part of the related development at the Edenderry Renewable Energy Complex, a diversion of an existing ESB Networks 20 kV overhead power line will be required. In accordance with ESB Networks procedures, detailed engagement on the design of the diversion, including confirmation of whether the line is re-routed overhead or placed underground, cannot be determined at this stage. Responsibility for progressing the diversion rests with Bord na Móna as landowner. Following the granting of planning permission, Bord na

Móna will submit a formal diversion application to ESB Networks, who will assess feasible rerouting options and determine appropriate technical solutions in accordance with their statutory and operational requirements.

When considered in combination, the cumulative construction-phase impact of the Proposed Development and the related development on material assets (utilities) is assessed as ***negative, slight,*** and ***temporary,*** reflecting short-term disruption risk to ESB Networks 20 kV overhead power line the during construction rather than any permanent loss of utility infrastructure or capacity.

17.16.1.2 Other Existing / Permitted Development(s)

As noted above, the Proposed Development entails minimal use of material assets during construction.

Upgrade works to the existing Rinawade – Dunfirth Tee – Kinnegad 110 kV overhead line (Offaly County Council Reg. Ref. 2560500) intersect the Proposed Development in the vicinity of the Yellow River crossing. Both projects comprise linear infrastructure works, with construction activities that may take place within shared or proximate utility corridors.

The proposed Water Supply Project Eastern and Midlands Region (An Coimisiún Pleanála Reg. Ref. 323980) also intersects the Proposed Development to the north of the Edenderry Power Station. The proposed water supply infrastructure runs in an east–west direction through the townlands of Shean / Ballykilleen, in proximity to the GNI143 Ballykilleen Pipeline road and watercourse crossings, RDX17 and WCX29. Based on available programme information, there is potential for an overlap in construction timelines between the Water Supply Project and the Proposed Development. This potential interaction has been considered as part of the assessment.

The Ballydermot Windfarm project has also been identified as a potential future development, with potential clashes related to access road development.

In the absence of coordination, there is potential for construction-phase utility conflicts or clashes. These potential interactions are common to large-scale linear utility projects and are typically managed through co-ordinated construction planning, detailed utility mapping, and advance agreement. Where cumulative effects could arise in relation to material assets and utilities, these are confined to the construction phase and relate to logistical interactions between projects, rather than environmental impacts.

With appropriate inter-project coordination, including liaison between project teams, agreement on construction phasing, and coordination of access arrangements, cumulative effects on material assets (utilities) are not anticipated. While there is potential for cumulative impacts during simultaneous construction phases, the likely cumulative impact on material assets (utilities) is assessed as ***neutral, imperceptible****, and* ***short-term.***

17.16.2 Operational Phase

17.16.2.1 Related Development

During the operational phase, the Proposed Development will operate as a buried gas transmission pipeline with limited above-ground infrastructure. As set out in Sections 15.4.2 to 15.7.2, operational interactions with electricity, water, wastewater, telecommunications and gas infrastructure are minimal and fully accommodated within existing utility networks.

During the operational phase, the GNI143 Ballykilleen Pipeline and Kilwarden Offtake Installation will require no ongoing utility connections. The Ballykilleen AGI will connect to existing utilities serving the Edenderry Power Station site, including the surface water drainage system (private network), and will also require power and broadband connections for system monitoring and data transmission. The Proposed

Development will therefore have limited interaction with material assets (utilities), primarily related to these connections.

The related development at the Edenderry Renewable Energy Complex will operate within an established industrial setting with sufficient utility capacity in place. Any permanent utility diversions associated with the related development, including the diversion of the existing ESB Networks 20 kV power line, will have been completed prior to operation and formalised through the relevant statutory utility provider processes.

Once operational, there will be no requirement for further utility diversions, capacity upgrades or service interruptions arising from either the Proposed Development or the related development. Accordingly, when considered in combination, the operational-phase cumulative impact of the Proposed Development and the related development on material assets (utilities) is assessed as ***neutral, imperceptible, and long-term***.

17.16.2.2 Other Existing / Permitted Development(s)

The operational phase of the Proposed Development will not place significant demands on utility infrastructure. No new permanent connections or operational loads are introduced that would affect availability or capacity of electricity, water, wastewater, telecommunications or gas infrastructure serving other existing or permitted developments.

Other existing and permitted developments within the study area will continue to operate independently within their own permitted utility arrangements. As the potential for cumulative interactions with material assets and utilities is confined to the construction phase, no cumulative operational effects are predicted.

Accordingly, the operational-phase cumulative impact of the Proposed Development in combination with other existing or permitted developments on material assets (utilities) is assessed as ***neutral, imperceptible,*** and ***long-term.***

17.17 Material Assets - Waste

17.17.1 Construction Phase

17.17.1.1 Related Development

The construction of the Proposed Development and the related developments within the Edenderry Renewable Energy Complex will require site clearance, excavation and levelling works, resulting in the generation of excavated soils and Construction and Demolition Waste (C&DW). Where construction activities overlap temporally, there is potential for a short-term increase in waste arisings within the local area.

In the absence of appropriate waste management practices, operational waste could be managed contrary to the waste hierarchy, resulting in otherwise recyclable or recoverable materials being unnecessarily disposed of to landfill. Such a scenario could give rise to indirect, long-term, negative effects on the local and regional environment. Improper storage or disposal of waste could also lead to localised littering or pollution issues, with associated secondary effects such as attraction of vermin. Without mitigation, these effects would be indirect, potentially significant and negative.

There is a high density of licensed waste collection permit holders operating within the Eastern Midlands region and nationally, as confirmed by the National Waste Collection Permit Office and the Environmental Protection Agency. As such, sufficient capacity exists to manage waste generated by the Proposed Development and the related developments concurrently, if required. Similar waste streams are anticipated across these developments, including excavated soils, concrete, packaging materials and general construction waste.

Development at the Edenderry Renewable Energy Complex will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the effect will be ***short-term, not significant*** and ***neutral.***

17.17.1.2 Other Existing / Permitted Development(s)

In a worst-case scenario, multiple developments in the area could be constructed concurrently or overlap during the construction phase. The construction of the Proposed Development and other existing and permitted developments will require site clearance, excavation, and levelling, generating a need for soil removal and/or import. Concurrent works will also produce additional Construction and Demolition Waste (C&DW) in the local area.

Due to the high number of licensed waste contractors in the South Dublin Area, Eastern Midlands regions and across Ireland, as confirmed by the National Waste Collection Permit Office and the Environmental Protection Agency, sufficient capacity exists to manage waste generated by these sites simultaneously, if required. Similar waste materials are expected to be generated across all developments.

An increased density of construction activities in the short term may result in higher traffic from waste contractors; however, this is likely to improve the efficiency of waste collections overall and will be temporary in duration.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the effect will be ***short-term, not significant*** and ***neutral.***

17.17.2 Operational Phase

17.17.2.1 Related Development

During the operational phase of the Proposed Development, small quantities of waste will be generated on an intermittent basis, primarily associated with routine inspection, upkeep and maintenance activities. Typical waste streams are expected to include minor quantities of packaging, spent consumables, components and general maintenance waste.

The nature and scale of the Proposed Development means that operational waste arisings will be small in volume and infrequent.

Operational activities at the Edenderry Renewable Energy Complex will be required to comply with relevant national and local waste legislation, policies and management plans. Waste will be removed by authorised waste contractors and transferred only to appropriately licensed waste facilities. The use of unauthorised facilities will be avoided through appropriate oversight and management procedures.

With the application of standard operational waste management practices and regulatory controls, the potential for adverse effects is effectively mitigated. Accordingly, the operational phase impact on material assets (waste), when considered alone or cumulatively with the related development at the Edenderry Renewable Energy Complex, is assessed as ***neutral***, ***imperceptible*** and ***long-term.***

17.17.2.2 Other Existing / Permitted Development(s)

There are existing residential and commercial developments close by, along with the permissions for large infrastructure development pending approval. All of the current and potential developments will generate similar waste types during their operational phases. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An

increased density of development in the area is likely improve the efficiencies of waste collections in the area.

Other developments in the area and the developments planned for the surrounding land will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a ***long-term, imperceptible*** and ***neutral***.