Proposed Derrygreenagh Power Project
Environmental Impact Assessment Report

Chapter 19: Cumulative Effects and Interactions

Prepared for:
Bord na Móna Powergen Limited
Main Street
Newbridge
Co. Kildare
W12 XR59

Prepared by:
AECOM
4th Floor, Adelphi Plaza
Georges Street Upper
Dun Laoghaire
Co. Dublin
A96 T927

T: +353 (0) 1 238 3100
aecom.com

19.0 CUMULATIVE EFFECTS AND INTERACTIONS

19.1 Introduction

19.1.1 This Chapter of the Environmental Impact Assessment Report (EIAR) provides an assessment of the potential for cumulative and interaction of effects as a result of the Proposed Development and Overall Project.

19.1.2 Annex IV (5)(e) of the EIA Directive as amended by Directive 2014/52/EU requires that the EIAR shall contain:

> *"A description of the likely significant effects of the project on the environment resulting from, inter alia:*
>
> *(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;"*

19.1.3 Furthermore, Annex IV (5) states that the EIAR shall contain:

> *"The description of the likely significant effects on the factors specified in Article 3(1) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project".*

Cumulative Effects

19.1.4 Cumulative effects are described as follows as per the EPA '*Guidelines on the information to be contained in Environmental Impact Assessment Reports'* (EPA, 2022):

> *"Cumulative Effects: The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects. While a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or insignificant), result in a cumulative impact that is collectively significant."*

19.1.5 Article 3 (1) of the EIA Directive as amended by Directive 2014/52/EU requires that:

> *"The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors: (a) population and human health; (b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC; (c) land, soil, water, air and climate; (d) material assets, cultural heritage and the landscape; (e) the interaction between the factors referred to in points (a) to (d).*

19.1.6 The '*Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*' (Government of Ireland, 2018) provides high level guidance on the assessment of cumulative effects.

19.1.7 Table 3.5 of the EPA Guidelines (2022) provides a checklist for the information required to describe effects in relation to a number of criteria. Cumulative effects is considered one of these criteria. For the assessment of cumulative effects, it should be considered whether the EIAR has:

- *'described cumulative effects?*
- *considered cumulative effects due to cumulation of effects with those of other projects that are existing or are approved but not yet built or operational?'*

19.1.8 The findings presented in this EIAR chapter draws on the assessment of effects provided in Chapters 7 to 18 of this EIAR, and information in the public domain relating to other known developments within the Study Area - within c. 5km of the Proposed Development and Overall Project. Each technical chapter of the EIAR includes a cumulative assessment which considers the cumulative impact of project elements within the Proposed Development and the Overall Project cumulatively with and other relevant plans, projects, and activities including existing projects (where relevant, projects that have applied for or received consent) and other future projects (as far as practically possible).

19.1.9 The cumulative impact assessment does not consider other developments that are already constructed and operating, as these existing developments are already accounted for in the baseline conditions established for the main assessments within Chapters 7 to 18 of this EIAR. The requirements of the EIA Directive and Guidelines to consider existing projects is therefore dealt with in those chapters. This Chapter considers only proposed developments, being "*permitted or planned project*s" noted in paragraph 3.7.3 of the EPA Guidelines (2022).

19.1.10 In scoping the project pathways (direct and indirect) that can magnify effects through the interaction or accumulation of effects, for instance the potential for cumulative significant effects to arise from multiple non-significant effects were given careful consideration.

Interaction of Effects

19.1.11 The interaction of effects within the Proposed Development in respect of each of the environmental factors have been identified and addressed in detail in the respective chapters in this EIAR. This chapter of the EIAR presents a summary of each assessment of the interaction (inter-relationship) of effects for which the Proposed Development and Overall Project may have on the receiving environment and sensitive receptors.

19.1.12 Interactions of effects are those resulting from a single development (the Proposed Development) on any one receptor that may collectively cause a greater effect (*e.g.*, such as the combined effects of noise and visual disturbance impacts during construction on birds).

19.1.13 Full details of the Proposed Development and Overall Project are provided in **Chapter 5** and details of the Existing Site and Conditions are presented in **Chapter 4** of this EIAR.

19.2 Assessment Methodology

19.2.1 This assessment aims to identify the likelihood for cumulative and interactions between effects on different environmental factors expected to occur during the construction and operation (including maintenance) of the Proposed Development and Overall Project and the decommissioning of the Power Plant Area, and where possible, identify the possibility for significant effects.

19.2.2 Cumulative construction effects are assessed assuming construction of the Proposed Development starts in 2025. This assessment is on a worst-case basis because it is possible that other developments are permitted or approved between the date of the preparation of this EIAR and the date when construction commences.

19.2.3 The cumulative operational assessment considers the total effects of the Proposed Development and the other identified developments operating concurrently.

19.2.4 With regard to the operational phase, it is envisaged that the Power Plant infrastructure (located in the Power Plant Area) will have a design life of 25 years, while the Electricity Grid Connection and gas connections will be managed by the respective transmission asset operators (TAO) and transmission service operators (TSO) (GNI for gas and ESBNI and EirGrid for electricity); as part of the national grid electricity and gas networks. For the purpose of this environmental assessment, the lifetime of the Power Plant is estimated as 25 years and this is based on the design life of the equipment proposed.

19.2.5 At the end of the design life, the Power Plant would either be decommissioned, or the lifetime could potentially be extended. Decommissioning or extension of the lifetime of the asset would therefore be expected to commence at some point after 2052. Cumulative effects during decommissioning of the Proposed Development are not considered as there is no defined time at which decommissioning will take place therefore no certainty of temporal overlap with other identified developments and their decommissioning.

19.2.6 There is no standard prescriptive method for assessing cumulative and interaction of effects. In relation to cumulative effects, the extent to which the effects of other developments can be assessed quantitatively depends on the level of information available about the other developments. Such effects are, therefore, assessed by professional judgment, although matrices and modelling are used where appropriate and where enough information regarding the other developments exists. Where environmental assessment information regarding other developments is not available or uncertain, the assessment is necessarily qualitative. These limitations are outlined in **Section 19.6**.

Cumulative Effects

19.2.7 A search of committed developments (i.e., one that has received full or outline planning permission) in the locality of the Proposed Development was undertaken using publicly available data from the MyPlan.ie 'National Planning Application' database, An Bord Pleanála (ABP) database, County Council's planning portals and the EIA portal.

19.2.8 A desktop planning history search for the last five years and within 5km of the Proposed Development and Overall Project was undertaken using these resources to assess historical and current land use. Planning applications older than ten years have not been assessed as they have been deemed to either have expired or have been constructed. A full list of planning applications obtained from the search is presented in **Appendix 19A** (refer to EIAR Volume II). A search area greater than 5km has been undertaken for certain environmental factor considerations such as air quality and climate (other gas fired power plants) which have further reaching effects. The planning applications as detailed in **Table 19.1** below have been considered.

Table 19.1: Planning Applications within the vicinity of the Proposed Development

PLANNING REF.	SUMMARY DETAILS	ADDRESS / APPLICANT	STATUS
WCC 21386	Construct a residential development of 9 no dwellings.	Clear Premier Homes - Dublin Road, Rahanine, Rochfortbridge	Granted 22/02/2022 Permitted
WCC ABP-309112-21	Development for the storage and seasoning of biomass logs.	Bord na Mona Energy Ltd, Toar, Rarthgarrett, Tyrellspass	Granted 11/05/2021 Permitted
WCC 22247	Construction of a logistics warehouse.	Dumper Depot Ltd, Farthingstown, Rochfortbridge	Granted 21/02/2023 Permitted
WCC 21371	Construct 18 no 2 storey terrace dwellings.	Mark Kelly - Castlelost, Rochfortbridge	Awaiting decision Submitted
WCC 2260051	Phased extraction of sand and gravel (wet working). An EIAR and NIS has been submitted.	Kilsaran Concrete Unlimited Company - Farthingstown Townland, Mongagh Bridge, Rochfortbridge	Awaiting decision Submitted
WCC ABP-312783	A 220 kV Gas Insulated Switchgear (GIS) Electrical substation and two 220 kV underground transmission cables.	Lumcloon Energy Ltd - Kiltotan and Collinstown and Oldtown, Rochfortbridge	Granted 09/09/2022 Permitted
OCC 22490	Construction of a materials recovery facility for the processing of up to 90,000 tonnes per annum of waste	Oxygen Environmental Unlimited Company - Derryarkin, Rhode, Co. Offaly	Awaiting decision Submitted
OCC 23277	To import soil and stone not exceeding 25,000 tons over a period of 2 yrs for the purpose of raising existing ground levels	Knockdrin and Derrygreenagh Townslands, Rhode, Co. Offaly - Tony McCabe	Awaiting decision Submitted
OCC 19176	Erection of a guyed wind monitoring mast, 100m in height, for a period of six years.	Bord na Mona Powergen Ltd - Derrygreenagh, Rhode	Granted 11/06/2019 Operational
OCC 18324	The filling of lands with inert waste for the purpose of land reclamation and all associated ancillary facilities.	Kilmurray Pre-Cast Concrete Ltd - Derryarkin, Rhode	Granted - 24/10/2019 Operational
OCC 1849	Development consisting of the extraction of sand and gravel from a greenfield area. An EIAR and NIS has been submitted.	Kilmurray Pre-Cast Concrete Ltd - Derryarkin, Rhode	Granted 29/03/2018 Permitted
OCC 1925	Extension to the southwest and south-east of the existing sand and gravel pit upgrading.	Derryarkin Sand and Gravel DAC, Derrygreenagh Knockdrin Garr and Carrick townlands, Rhode	Granted 21/03/2019 In Construction
OCC 2171	Continuation of use of an internal haul road which connects two areas of an existing sand and gravel pit.	Kilmurray Pre-Cast Concrete Ltd - Derryarkin, Rhode	Granted 12/04/2021 Operation
OCC 21247	A 23-year permission for a 44.0-hectare extension to an existing authorised sand and gravel pit. An EIAR has been submitted.	Kilmurray Pre-Cast Concrete Ltd - Derryarkin, Rhode	Granted 18/02/2022 Permitted

PLANNING REF.	SUMMARY DETAILS	ADDRESS / APPLICANT	STATUS
OCC 20237	Development of a combined heat and power generating biomass gasification plant.	Newleaf Energy Ltd, Coolcor, Rhode	Granted 06/05/2021 Permitted
OCC 20238	An energy storage facility designed to provide system support services to the electricity grid on a 2.7-hectare site.	Rhode Energy Storage Ltd - Coolcor, Rhode	Granted 20/05/2021 Permitted
OCC 19161	Development of an energy storage facility designed to provide 20MW.	Schwungrad Energie Ltd - Coolcor, Rhode, Co. Offaly	Granted 04/06/2019 Permitted
OCC 22664	Construction of a 110 kV substation, Clonin, Rhode, Co. Offaly.	Eirgrid PLC - Derryiron 110kV Substation, Clonin, Rhode	Granted 23/02/2023 Permitted
OCC 19315	Continued use of an existing guyed wind monitoring mast, 100m in height for a further period of three years.	Bord na Mona Powergen Ltd - Ballybeg Bog, Derryiron	Granted 23/08/2019 In Operation
OCC ABP-309491	A 110 kV substation, associated 110 kV underground grid connection, cabling and associated works.	OBM solar Ltd - Srah, Coolcor and Clonin, Rhode	Granted 13/10/2021 Permitted
OCC ABP-304925	Solar PV energy development within a site area of approximately 15ha.	Highfield Solar Ltd - Clonin, Rhode	Granted 11/03/2021 Permitted
OCC ABP-315436	Application for Leave to Apply for Substitute Consent for peat extraction and all associated bog development works.	Bord na Mona - Derryhinch, Drumman, Derryarkin and Ballybeg Bogs located in Counties Meath, Westmeath and Offaly.	Awaiting decision Submitted
OCC 20494	A 10-year permission for the construction of a solar PV development.	OBM Solar Ltd. Srah Greenhilld and Wood, Rhode	Granted 26/04/2021 Permitted
OCC 21488	A 10-year permission for the construction of an extension to the permitted solar PV and battery storage development permitted.	OBM Solar Ltd. Srah Greenhilld and Wood, Rhode	Granted 10/12/21 Permitted
OCC 22446	Retention Permission for continuation of use for an existing guyed wind monitoring mast.	Bord na Mona Powergen Ltd, Ballybeg Bog, Derryiorn, Co. Offaly	Granted 05/12/2022 In Operation
OCC 21364	Solar panels ground floor mounted on support structures within an area of 1.73 ha.	Paschal Kavanagh, Clonin, Rhode, Co. Offaly	Granted 22/02/2022 Permitted
WCC 21515	The development comprising 275MWe reserve gas-fired generator. An EIAR has been submitted.	Lumcloon Energy Ltd, Kiltotan and Collinstown and Oldtown, Rochfortbridge, Co Westmeath	Granted 11/05/2022 Permitted
WCC 21532	The Energy Storage System (ESS) development. Permission is sought for 10 years. An EIAR has been prepared.	Lumcloon Energy Ltd, Kiltotan and Collinstown and Oldtown, Rochfortbridge, Co Westmeath.	Granted 11/05/2022 Permitted

PLANNING REF.	SUMMARY DETAILS	ADDRESS / APPLICANT	STATUS
OCC 20331	The storage and seasoning of biomass logs followed by chipping of the seasoned logs on a site area of 5.6 ha.	Bord na Mona Energy Ltd, Croghan Biomass Facility located in the townlands of, Drumcaw or Mountlucas, Co. Offaly	Granted 30/03/2021 Permitted
OCC 22607	Retention of flood lights and a new provision of an astroturf and gym.	Daingean GAA Club, Townparks Philipstown, Daingean, Co. Offaly	Granted 06/06/2023 In Operation
OCC 21552	Retention permission for construction of a grain storage shed with solar panels placed on south facing roof plane.	Moore Feeds Ltd, Old Crohan, Crohan, Rhode, Co. Offaly	Granted 10/05/2022 In Operation
OCC 21404	An extension and redevelopment to the rear of croghan community centre.	Croghan Local Development Group, Cannakill Croghan, Rhode, Co. Offaly	Granted 20/08/2021 In Operation
WCC 186396	Extension to an existing Nursing Home incorporating 25 new bedrooms.	Bethany House Nursing Home, Bethany House Nursing Home, Main Street, Tyrrellspass, Co. Westmeath	Granted 23/02/2019 Permitted
WCC 2153	Construction of 3 no semi-detached 2 storey houses and 2 number semi-detached bungalows.	YMS Building Services Ltd, Main Street, Tyrrellspass, Co. Westmeath	Granted 10/24/2021 Permitted
WCC 206372	Permission for minor alteration and a single storey classroom extension.	St. Anne's National School, Tyrrellspass, Co. Westmeath	Granted 24/02/2021 In Operation
WCC 206180	permission for a proposed sports and recreational development adjacent to existing GAA pitch and clubhouse.	The Trustees of Tyrrellspass GAA Club, Mullingar Road, Tyrrellspass, Co. Westmeath	Granted 25/02/2021 In Construction
WCC 196169	Development consisting of cut and fill of soil material located in the adjoining field Northwest to the Tyrrellspass GAA grounds.	The Trustees of Tyrrellspass GAA Club, Mullingar, Tyrellspass, Co. Westmeath	Granted 28/11/2019 In Construction
WCC ABP-309112	Retention works for an existing biomass facility until 2030.	Bord na Mona Energy Ltd, Toar, Rathgarrett, Tyrellspass, Co. Westmeath	Granted 11/05/2021 In Construction
ABP- OCC PA19.PA0032	A 15-year planning permission, for development of the Yellow River Wind Farm (96MW)	Green Wind Energy Ltd Rhode, Co. Offaly	Granted with conditions - 03/06/2014 In Construction
ABP - OCC/WCC/MCC TBC	Regularise the planning status of the peat extraction works that have been carried out at Derryhinch, Drumman, Derryarkin and Ballybeg Bogs which form part of the Derrygreenagh Bog Group.	Derryhinch, Drumman, Derryarkin and Ballybeg Bogs Bord na Mona PLC	Potential Project
ABP – OCC TBC	Emerging project to deliver a range of low to zero carbon energy generation and storage assets across a land bank of over 3000ha.	Derrygreenagh Bog Group	Potential Project

PLANNING REF.	SUMMARY DETAILS	ADDRESS / APPLICANT	STATUS
ABP - OCC TBC	Emerging project to deliver a range of low to zero carbon energy generation and storage assets across a land bank of over 5ha.	Rhode Derrygreenagh Bog Group	Potential Project
ABP / WCC TBC	Emerging project consisting of a gas connection corridor for Castlelost.	Castlelost	Potential Project
List of gas-fired plants submitted or approved			
DCC 2697/20	Permission for alterations to the existing North Wall Power station, reducing from approximately 270 MW to 230 MW.	ESB North Wall Power Generating Station, Dublin	Granted 28/08/2020 Permitted
Fingal Council FW20A/0053	Proposed development for a 75 MWe aero derivative gas fired turbine for the generation of electricity.	ESB Corduff Road, Dublin	Granted 18/11/2020 Permitted
Cork CC 186919	A 55 MWe (electrical output) aero derivative gas fired turbine.	ESB Aghada Generating Station, Co. Cork	Granted 20/12/2018 Permitted
ABP - KCC ABP PA0028	Combined Heat and Power (CHP) Plant (500 MW).	Shannon LNG Limited Ballylongford, Co. Kerry	Granted 09/07/2013 Permitted
SDCC SD15A/0061	A 10-year permission for the construction of a 115 MW peaker Power Plant.	Grange Backup Power Ltd. Grange Castle Business Park, Dublin	Granted 22/05/2015 In Construction
SDCC SD16A/0398	Amendments to previously granted planning permission reducing the capacity from 115MW to 96MW.	Grange Backup Power Ltd. Grange Castle Business Park, Dublin	Granted 27/02/2017 In Construction
Fingal Council FW19A/0090	Proposed development consisting of the installation of 10 No. containerised gas fired generating units.	Energy Stability Services Ltd Fingal, Co. Dublin	Granted 10/01/2020 Permitted
Fingal Council FW20A/0219	Amendments to the original permission, for a gas peaking facility with 10 no. containerised gas fired generating units (20MW).	Energy Stability Services Ltd Fingal, Co. Dublin	Granted 07/04/2021 Permitted
SDCC SD20A/0058	Demolition of the existing single storey house and construction of a gas-powered Power Plant with 110MW.	Data & Power Hub Services Ltd. Newcastle, Co. Dublin	Granted 17/12/2020 Permitted
DCC 3624/20	The development will consist of a 75 MWe (electrical output) aero derivative gas fired turbine for the generation of electricity.	ESB Poolbeg, Generating Station, Dublin	Granted 22/06/2021 In Construction
SDCC SD22A/0025	Retention and continuance of the use for a further two years of the temporary gas-powered generation plant.	EdgeConneX, Clondalkin, Dublin	Granted 12/05/2022 Operational
SDCC SD21A/0167	Construction of a gas fired power plant with an electrical output of up to 125MW.	Greener Ideas Limited Baldonnel, Dublin	Granted 30/08/2022 Permitted

PLANNING REF.	SUMMARY DETAILS	ADDRESS / APPLICANT	STATUS
Roscommon CC 22234	Permission for revisions and alterations of a gas fired power plant to change the output to 102MW.	Greener Ideas Ltd Athlone, Co. Roscommon	Granted 18/08/2022 Permitted
ABP- DCC ABP 313918	Temporary emergency electricity generating plant, operating on natural gas for up to 500 hours per year.	Minister for the Environment, Climate and Communications North Wall Power Generating Station, Dublin	Granted 13/09/2022 Operational
ABP - OCC ABP-315836	Emergency Electricity Generation for the installation of up to 450MW at two sites Shannonbridge generating stations.	ESB West Offaly Power Station, Co. Offaly	Granted 29/03/2023 Permitted
ABP - KCC ABP-315838	Emergency Electricity Generation for three OCGT plants with a total output capacity (net output) of 150 MW.	SSE Generation Ireland Limited Tarbert, Co. Kerry	Granted 29/03/2023 Permitted
Fingal CC ABP-317480	The construction of a Gas Turbine Power Generation Station with an output of up to 293 Megawatts.	Kilshane Energy Ltd Finglas, Dublin	Awaiting decision Submitted
ABP - DCC ABP 314778	Emergency Electricity Generation for a gas generator to provide an output of 50MW.	Department of the Environment, Climate and Communications Huntstown Power Station, Dublin	Granted 16/12/2022 Operational
DCC PWSDZ3074/23	Construction of an OCGT generating unit with an output of 299MW.	ESB Adjacent to the Dublin Bay Power Generating Station, Dublin	Awaiting decision Submitted
DCC 3137/23	Construction of an OCGT generating unit with an output of 299MW.	ESB Poolbeg Generating Station, Co. Dublin	Awaiting decision Submitted
Mayo CC 2360028	The development will consist of a 114-Megawatt gas fired peaking power plant.	Constant Energy Ltd. Bellacorick, Co. Mayo	Awaiting decision Submitted
Cork CC 235104	Construction of an OCGT generating unit with an output of 299MW.	ESB Aghada Generating Station, Co. Cork	Awaiting decision Submitted
Meath CC 2360212	The Proposed Development will comprise a 170MW (electrical output) Open Cycle Gas Turbine (OCGT) Power Plant.	SSE Generation (Ireland) Ltd. Platin, Duleek, County Meath	Awaiting decision Submitted
ABP - GCC ABP-317810	Construction of an OCGT plant with an output of 350MW.	EP Energy Developments Ltd Tynagh, County Galway	Awaiting decision Submitted

Interaction of Effects

19.2.9 The significant effects of the Proposed Development and Overall Project and the measures proposed to mitigate these effects have been outlined in this EIAR. However, in any development with the potential for environmental effect there is also the potential for interaction between effects of the different environmental factors. The result of these interactions may either exacerbate the magnitude of the effect or may in fact ameliorate it.

19.2.10 Examples of key potential interactions include:

- Biodiversity and Water Environment: interactive effects could potentially occur to the surface water environment. They could include potential impacts on aquatic species, requiring mitigation measures.
- Cultural Heritage and Archaeology, and Landscape and Visual: interactive effects could potentially occur in relation to the landscape character and setting of cultural heritage assets.
- Cultural Heritage and Archaeology, and Noise and Vibration: interactive effects arising from construction related vibration activities potentially piling depending upon the method implemented, could potentially impact on cultural heritage sites.
- Cultural Heritage and Archaeology, and Land, Soils and Geology: interactive effects arising from dewatering could potentially impact on cultural heritage sites.
- Population and Human Health and other topics: interactions in the human environment are typically complex within an EIAR as there is the potential for receptors to be impacted in a number of ways.
- Major Accidents and Disasters (MA&Ds) and other topics: interactive impacts are typically complex within an EIAR as there is the potential for receptors to be impacted in a number of ways, such as an explosion or major storm event.

Significance of Effects

19.2.11 The cumulative effects of other developments with the Proposed Development and Overall Project are assessed against the significance criteria outlined in **Table 1.5** of **Chapter 1** (Introduction) of this EIAR. These effects are determined from the potential impacts identified in the individual assessments. Mitigation measures are identified if required, and where relevant residual impacts assessed.

19.3 Legislation and Planning Policy Context

19.3.1 This EIAR has been prepared in accordance with the EU EIA Directive 2011/92/EU and as amended by EIA Directive 2014/52/EU and in accordance with the requirements of the EU (Planning and Development) (Environmental Impact Assessment) Regulations 2018, in order to inform the consideration of the application and provide the planning authority with the environmental information that must be taken into account when determining the application.

19.3.2 The requirement for cumulative and interaction of effects on assessments is stated in the relevant European Directive and Irish legislation, as detailed below:

- European Directive 2014/52/EU on the assessments of effects of certain public and private projects on the environment requires an assessment of: "the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project".
- S.I. No. 296 of 2018 - European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018:

  "Schedule 6; Article 94, 2(e)(i)(V) the cumulation of effects with other existing or approved developments, or both, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources".

  "Schedule 6; Article 94, 2(e)(ii) the description of the likely significant effects on the factors specified in paragraph (b)(i)(I) to (V) of the definition of 'environmental impact assessment' in Section 171A of the Act should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the proposed development, taking into account the environmental protection objectives established at European Union level or by a Member State of the European Union which are relevant to the proposed development".

19.4 Cumulative Effects Assessment

Air Quality

19.4.1 The potential cumulative effects of the Proposed Development and Overall Project with other projects have been considered in terms of impacts on Air Quality. There are a number of proposed or permitted housing developments within the vicinity of the Proposed Development and Overall Project.

19.4.2 The cumulative assessment also considers the potential future Derrygreenagh Renewable Energy application. A description of the developments is provided in **Appendix 19A**.

19.4.3 The construction dust emissions to air from other committed developments and cumulative emissions sources in the area around the Site are not close enough to generate cumulative impacts should they occur at the same time, aside from the submitted development Planning Ref: 21/2192[1]. The magnitude of effect considered in the non-cumulative assessment of dust emissions would remain the same when considering cumulative effects including the construction phase of the submitted development Planning Ref: 21/2192. The risk and associated level of mitigation would therefore be the same as set out in the Chapter 7 Air Quality.

19.4.4 For the cumulative operational emissions to air, with the magnitude of the predicted impacts and NO_2 and CO concentrations, it is considered unlikely that the Proposed Development and Overall Project will interfere with policies or plans in place to bring about sustained achievement of the AQS values. The overall effect of changes in NO_2 and CO concentrations due to emissions from the Proposed Development is considered to be **Imperceptible**.

19.4.5 To conclude, cumulative effects on air quality are expected to be **Imperceptible**. Any other proposed developments which are not accounted for in background pollutant concentrations would be unlikely to cause a significant impact.

Cultural Heritage and Archaeology

19.4.6 In order to assess the cumulative effects on archaeology and cultural heritage the Proposed Development and Overall Project is considered in the context of a number existing, proposed and permitted developments in the area, refer to **Appendix 19A**.

19.4.7 The addition of the Proposed Development and Overall Project to this already largely altered landscape (i.e., through the existing and renewable energy developments) will not result in a visual impact to any nearby recorded monuments, protected structure or NIAH structures or features. Therefore, as the Proposed Development and Overall Project will not result in any significant indirect visual impact on cultural heritage sites, there will not be any potential for cumulative impacts of same.

19.4.8 In terms of potential cumulative direct impacts, potential direct impacts which may occur to sub-surface archaeological features within the site of the Proposed Development and Overall Project will be mitigated against.

19.4.9 The Proposed Development and Overall Project in combination with other developments, could result in potential negative effects to sub-surface archaeological feature (i.e., cumulative impacts). Since each of these projects considered cumulatively (listed in Section 4.7 of **Chapter 4**) have been or will be subject to thorough assessment from a cultural heritage perspective through the EIAR process, all potential negative

[1] Planning Ref: 21/2192 refers to the development of an OCGT power plant (299MW) and associated infrastructure and buildings at Tynagh Power Station in Derryfrench, Loughrea, Co. Galway. Permission was granted on 8 February 2023.

effects of other projects are deemed to have been dealt with through the use of effective mitigation measures and planning conditions issued by the relevant Planning Authorities. There is no potential for cumulative impacts to surface or sub-surface archaeological features arising from the Proposed Development and Overall Project in combination with other project.

19.4.10 The analysis of potential direct and indirect impacts on cultural heritage concludes that the Proposed Development and Overall Project will result in **no significant** impacts. There is no potential for cumulative impacts arising from the Proposed Development and Overall Project in combination with other projects. **No significant** cumulative impacts on cultural heritage are anticipated during the construction, operation or decommissioning phase, following successful implementation of the mitigation measures outlined in **Chapter 8** of the EIAR.

Biodiversity

19.4.11 The majority of the cumulative projects listed in **Table 9.16** of **Chapter 9**, sufficiently distant and of a certain nature and scale that there are no pathways for these to act in-combination with the Proposed Development and Overall Project. Of the developments which are relatively close to the Proposed Development and Overall Project (i.e., within c. 1km of the site), there is no likelihood of in-combination effects with the ecological receptors addressed in **Chapter 9** following mitigation measures outlined in respective projects.

19.4.12 With respect to the receptors for which there are residual effects identified from the Proposed Development and Overall Project (refer to Section 9.7 of **Chapter 9**), amphibians are likely to remain in suitable terrestrial habitat within 200-250m of breeding ponds, and therefore none of the projects identified will cumulatively impact amphibians or their habitat.

19.4.13 None of the projects identified will have impacts on breeding or wintering birds which may combine with the Proposed Development and Overall Project, due to the nature of these projects and their distance from the Proposed Development and Overall Project.

19.4.14 The scale and location of each of these plans and projects have been considered cumulatively with each other and the construction and operation of the Proposed Development and Overall Project. Any impacts arising would not cause significant effects to any ecological receptors over those already identified and considered in each assessment.

Landscape and Visual

19.4.15 Projects considered (refer to **Appendix 19A**) have the potential to create varying degrees of combined and sequential landscape effects due to a further industrialisation of the landscape. While these changes will be most evident locally up to approximately 500m to 1km from site boundaries, in combination they can increase the prevalence of industrial elements in the wider study are. Overall, the magnitude of cumulative landscape change is considered to be **Low**. The significance/ quality will be **Slight Adverse**.

19.4.16 Visually, cumulative effects will be mainly related to a combined visibility of industrial features in available views, particularly from elevated locations throughout the study area such a Croghan Hill and Knockdrin Hill or elevated sections of the R446. Combined visibility will increase industrial elements in available views, intensifying the prevalence of industrial focus points in open views in particular where there is no or little intervening screening vegetation or topography. The frequency of sequential views of industrial facilities will likely increase, altering the perception of the visual experience in the study

area. Overall, the magnitude of cumulative landscape change is considered to be **Low**. The significance / quality will be **Slight Adverse**.

Noise and Vibration

16.1.1 Regarding the consideration of the contribution of other developments in the area (specifically those listed in **Appendix 19A**), it is useful to consider how much additional construction noise contribution would be required at each noise sensitive receptors (NSR) to exceed the assessment criteria of 65dB $L_{Aeq,12hr}$. As none of the listed developments are of a similar scale to the Proposed Development and Overall Project, and/or of similar proximity to NSRs, any cumulative adverse effect is therefore considered **Imperceptible** to **Not Significant** at NSRs positions with regards to construction phase noise levels generated by the Proposed Development and Overall Project on-site activities and potential concurrent construction activities related to construction of other developments..

19.4.17 In addition, the cumulative construction traffic assessment concluded that **no significant** cumulative adverse effect is expected at residential receptors with regards to construction traffic noise levels generated by cumulative impacts of the Proposed Development and Overall Project with other committed development traffic flows on existing roads. The changes are considered **Imperceptible** and **Short-Term**.

19.4.18 During the operational phase, cumulative effects from noise levels in the Day and Evening periods are not a concern as none of the committed developments identified above, either individually or in-combination, would be likely to produce significantly greater noise emissions than those predicted for the Proposed Development and Overall Project alone, with such a magnitude as to exceed these limits cumulatively. Therefore, cumulative impact in the Day and Evening can be excluded.

19.4.19 During the night-time scenario of the operational phase, the most likely receptor to be affected is NSR6 (refer to **Chapter 11**). Predicted operational sound levels from the Proposed Development and Overall Project are already at the relevant limit of 35 dB $L_{Aeq,8hr}$ at that location. A high-level review of the distances, operational times and nature of the other committed developments has been undertaken and confirms that these activities are either **Not Significant** or likely to generate noise in the night-time scenario of sufficient level in the vicinity of NSR6. At other receptors, the predicted levels from the Proposed Development and Overall Project are lower than the limit values. Operations at the other developments identified above are either not expected to be continuous during the night-time or are not likely to operate at all at night. On this basis, the cumulative impacts can also be excluded for all NSRs in the night-time period as well.

19.4.20 Any cumulative adverse effect is therefore considered **Negative** though **Not Significant** at residential receptor positions with regards to operational phase noise levels generated by the Proposed Development and Overall Project on-site activities and potential concurrent operational activities related to the operation of other developments.

Water Environment

19.4.21 Most of the projects listed in **Appendix 19A** are sufficiently distant and of a nature and scale that there are no pathways for these to act cumulatively with the Proposed Development and Overall Project. Of the committed developments which are relatively close to the Proposed Development and Overall Project, (*i.e.*, within c. 1km of the Site) there is no likelihood of cumulative effects with the water environment receptors addressed in **Chapter 12**, following the implementation of mitigation measures outlined in respective projects.

19.4.22 Most of the projects listed in **Appendix 19A** are sufficiently distant and of a nature and scale that there are no pathways for these to act in-combination with the Proposed

Development and Overall Project. Of the developments which are relatively close to the Proposed Development and Overall Project (i.e., within c. 1km of the site), there is no likelihood of in-combination effects with the water environment receptors addressed in **Chapter 12** following mitigation measures outlined in respective projects.

19.4.23 The scale and location of each of the projects listed have been considered cumulatively with each other and the construction and operation of the Proposed Development and Overall Project. Any impacts arising would not cause significant effects to any water environment receptors over those already identified and considered in each assessment.

Land, Soils and Geology

19.4.24 Most of the projects listed in **Appendix 19A** are sufficiently distant and of a nature and scale that there are no pathways for these to act in-combination with the Proposed Development and Overall Project. Of the developments which are relatively close to the Proposed Development and Overall Project (i.e., within c. 1km of the site), none are closer than 150m to the Proposed Development and Overall Project and there is therefore considered to be no likelihood of in-combination effects with the Land, Soil, and Geology environment receptors addressed in **Chapter 13** following mitigation measures outlined in respective projects

19.4.25 The scale and location of each of the projects listed have been considered cumulatively with each other and the construction and operation of the Proposed Development and Overall Project. Any impacts arising will result in **No Significant** impacts to any Land, Soil, and Geology receptors over those already identified and considered in each assessment. The Proposed Development and Overall Project is therefore not predicted to give rise to any cumulative impacts in terms of Land, Soil, and Geology at the site and surrounding area at either the construction, operational, or decommissioning phases.

Traffic and Transport

19.4.26 There are a number of neighbouring applications to be considered in the cumulative assessment. **Appendix 14F** sets out a filtering process to identify ones required to be included in the traffic cumulative assessment. Only those which generate significant traffic on our network have been considered.

19.4.27 To allow for a robust assessment, the traffic generated by these developments has been added to the road network to ensure that if it were to overlap with the Proposed Development and Overall Project, construction traffic not result in **no significant** impacts on the road network. The cumulative impact assessment concluded that R400 will remain within daily design capacity.

19.4.28 In addition to the above, junction modelling for the Proposed Power Plant Area access and surveyed junctions 5a/b – M6 Junction 3/ R400 roundabouts were carried out, assessing a worst-case of the peak, combined traffic plus trips from the cumulative assessment in the 2027 base year. The results concluded that the junctions are considered to operate satisfactorily, and no more analysis are required.

19.4.29 During the operational phase, the only development expected to generate regular operational traffic for the Proposed Development and Overall Project is the Power Plant Area. The Power Plant Area generates less traffic during operations than has been assessed during construction phase. Therefore, no further operational assessment has been undertaken.

Population and Human Health

19.4.30 During the construction phase, the site will employ good practice measures and suitable mitigation such that there would be **no significant** effect on receptors beyond the site boundary (as outlined in the relevant technical chapters and the CEMP). Other developments in the vicinity of the Proposed Development and Overall Project would be expected to bring forward a scheme with suitable measures in place to prevent significant impacts at receptors due to construction dust, noise and vibration, and water pollution.

19.4.31 The Proposed Development results in no land use impacts. There are subsequently no cumulative land use impacts during the operational phases on the land occupied by the Proposed Development and the surrounding area.

19.4.32 The assessment of Severance is inherently cumulative as the traffic data assessment includes the change in traffic generated by other committed developments.

19.4.33 Operation of the Proposed Development is expected to generate employment. The construction of other committed developments is also expected to lead to employment generation and, therefore, there could be a cumulative effect on employment of the local workforce.

19.4.34 The cumulative assessment of 'Access to Healthcare Services and other Social Infrastructure' is as per the cumulative assessment of 'Severance' set out previously.

19.4.35 For the assessment of 'Air Quality, Noise and Neighbourhood Amenity', there are no anticipated cumulative noise or dust effects during either the construction or operational phases.

19.4.36 The assessment of 'Climate Change' is based on the greenhouse gas (GHG) emissions assessment provided in **Chapter 17** (Climate). The GHG assessment is by nature a cumulative assessment as it considers whether the Proposed Development and Overall Project will contribute significantly to emissions on a national level.

Material Assets

19.4.37 During the construction phase, potential disruptions to existing utilities will be **Not Significant, Slight** or **Moderate**. It is not unreasonable to assume that the committed developments listed in **Appendix 19A**, which have also gone through the planning process, will also implement standard and best practice mitigation measures to the extent that impacts are not significant. Providing standard best practice control measures are implemented as required on all sites, the cumulative impact will be **Not Significant**.

19.4.38 Other projects considered have the potential to create varying volumes of waste from a number of waste categories, depending on the project. The quantities of these wastes are not anticipated to be large. Overall, there will be **No Significant** cumulative impact on waste services.

19.4.39 The scale and location of each of the projects listed have been considered cumulatively with each other and the construction and operation of the Proposed Development and Overall Project. Any impacts arising would result in **no significant** effects to any Material Assets and Waste and Resource Management receptors over those already identified and considered in each assessment.

Major Accidents and Disasters

19.4.40 During the construction phase, once the mitigation measures (detailed in **Chapter 17**) for the Proposed Development and Overall Project are implemented, **No Significant** cumulative with the Proposed Development and Overall Project and committed developments / projects during construction are anticipated.

19.4.41 During the operational phase, once the mitigation measures (detailed in **Chapter 17**) for the Proposed Development and Overall Project are implemented, **No Significant** cumulative with the Proposed Development and Overall Project and committed developments / projects during operations are anticipated.

Climate

19.4.42 The IEMA Guidance (IEMA, 2022) makes it clear that the standard approach to cumulative effects assessment for GHGs differs from that taken for many other environmental disciplines.

19.4.43 The environmental receptors for disciplines such as air quality, noise, traffic, landscape and visual intrusion etc. will generally be located in relatively close proximity to the source. The receptor for GHGs, however, is the entire global climate.

19.4.44 The current IEMA guidance states that:

> *"All global cumulative GHG sources are relevant to the effect on climate change, and this should be taken into account in defining the receptor (the atmospheric concentration of GHGs) as being 'high' sensitivity to further emissions.*
>
> *"Effects of GHG emissions from specific cumulative projects should not be individually assessed, as there is no basis for selecting any particular (or more than one) cumulative project that has GHG emissions for assessment over any other.".*

19.4.45 In essence, there is no difference in the impact on the global climate of a tonne of carbon dioxide equivalent emitted at the Proposed Development and Overall Project compared to the same mass of CO_2e emitted anywhere else on the planet.

19.4.46 Similarly, cumulative effects assessment is not sensible for climate change risks. The climate change risks identified for the Proposed Development and Overall Project are a function of global climate change and the influence from specific individual projects cannot be individually assessed.

19.4.47 Therefore, is it considered that cumulative effects are not relevant for this climate change assessment.

19.5 Interactions

19.5.1 As part of the requirements of an EIAR, the interaction of the effects on the surrounding environment must be addressed. Potential interactions (both positive and negative) have been considered for the construction, operation, and decommissioning phases of each of the different environmental aspects.

19.5.2 The predicted impacts of eventual decommissioning and demolition of the Power Plant Area are considered to be comparable to, or less than, those assessed for construction activities. Therefore, it is considered that impacts and subsequent effects identified for construction in this assessment can also be used to represent potential impacts and effects during the decommissioning phase. In addition, decommissioning of the Electricity Grid Connection and Gas Connection Corridor are not envisaged and have not been assessed under this EIAR as they will be managed by EirGrid and Gas Networks Ireland (GNI) respectively once they are operational and will become an important part of the Republic of Ireland's national grid infrastructure.

19.5.3 Mitigation of interactions of effects is best achieved through management and control measures to prevent the individual impacts in the first instance or reduce the impacts themselves and therefore reduce the likelihood of such interactions occurring.

19.5.4 **Table 19.2** summarises the potential interactions between different aspects, and these are discussed further in the following sections.

Table 19.2: Potential Interactions of Effects

	Air Quality		Cultural Heritage & Archaeology		Biodiversity		Landscape & Visual		Noise & Vibration		Water		Land, Soils & Geology		Traffic & Transport		Population and Human Health		Material Assets		Major Accidents & Disasters		Climate	
	Con	*Op*	*Con*	*Op*	*Con*	*Op*	*Con*	*Op*	*Con*	*Op*	*Con*	*Op*	*Con*	*Op*	*Con*	*Op*	*Con*	*Op*	*Con*	*Op*	*Con*	*Op*	*Con*	*Op*
Air Quality																								
Cultural Heritage & Archaeology	✓	✘																						
Biodiversity	✓	✓	✘	✘																				
Landscape & Visual	✘	✓	✓	✓	✓	✓																		
Noise & Vibration	✘	✘	✓	✘	✓	✓	✘	✘																
Water	✘	✘	✓	✘	✓	✓	✘	✘	✘	✘														
Land, Soils & Geology	✓	✘	✓	✘	✓	✘	✓	✘	✓	✘	✓	✓												
Traffic & Transport	✓	✘	✓	✘	✓	✓	✓	✘	✓	✘	✓	✘	✓	✘										
Population & Human Health	✓	✓	✘	✘	✘	✘	✘	✓	✓	✓	✘	✓	✓	✘	✓	✘								
Material Assets	✘	✘	✘	✘	✘	✓	✘	✓	✘	✘	✓	✓	✘	✓	✓	✘	✓	✘						
Major Accidents & Disasters	✘	✓	✘	✘	✘	✓	✘	✘	✘	✘	✘	✓	✘	✓	✓	✓	✓	✓	✘	✓				
Climate	✓	✓	✘	✘	✘	✘	✘	✘	✘	✘	✓	✓	✘	✘	✓	✓	✘	✓	✘	✘	✘	✓		

Con	*Construction Phase*
Op	*Operational Phase*

✘	No interaction
✓	Interaction

Discussion of Interactions

19.5.5 The following sections summarise the primary interrelationship of aspects of the environment with the potential for significant effects as a result of the Proposed Development and Overall Development.

19.5.6 A summary of the interactions presented in **Table 19.2** are outlined below.

Air Quality

19.5.7 During the construction phase of the Proposed Development and Overall Project, air quality interactions with other environmental aspects relate to dust and air pollutants resulting in impacts on human health, changes to the setting of cultural or archaeological assets, impacts on ecological receptors (e.g., physical smothering), effects on amenity due to increased dust deposition, and effects on climate due to increased GHG emissions. Interactions during the operational phase involve emissions from the Power Plant stacks and associated air quality impacts on ecological and human receptors, deposition of pollutants on the ground, and increased GHG emissions affecting climate.

19.5.8 Emissions resulting from the construction and operational phases will be controlled in accordance with standard good working practices as described in the relevant EIAR Volume I chapters (which include, for example, dust suppression measures) and are considered to be **Not Significant**. Taking into consideration the implementation of mitigation and enhancement measures, the distance of receptors from areas where emissions are generated, and compliance of the Power Plant Area with the requirements of the European Union (Large Combustion Plants) Regulations 2012 S. I. No. 566 of 2012 under an Industrial Emissions (IE) Licence, no significant impacts on cultural heritage assets, climate, human, amenity, or ecological receptors due to changes on air quality were identified.

19.5.9 Air Quality interactions with Cultural Heritage, Biodiversity, Landscape and Visual, Land, Soils and Geology, Population and Human Health, and Climate, are discussed under the relevant following sections.

Cultural Heritage and Archaeology

19.5.10 Chapter 8 Cultural Heritage (EIAR Volume I) notes that it considers a study area appropriate to each element of the Overall Project. For the assessment of effects on archaeology and cultural heritage, the study area ranges from 0.5-1km from the relevant element, and from 0.5-3km for the visual setting assessment of designated heritage assets.

19.5.11 During the construction phase, there is potential for effects on the setting or integrity of heritage assets (e.g., historic monuments) or previously unrecorded archaeological features derived from changes in air quality, landscape and visual characteristics of the area, noise and vibration levels, ground conditions, and groundwater levels, as a result of construction traffic and works. The assessment identified **Moderate to Slight, Short-Term** to **Long-Term**, and **Neutral** to **Adverse** effects on protected structures and designated assets, although no significant effects were identified. Potential effects on previously unrecorded archaeological assets are, however, assessed to be **Moderate** to **Significant**, **Permanent**, and **Adverse**. Taking into consideration the implementation of embedded and proposed mitigation measures proposed and described in the relevant chapters of EIAR Volume I, the residual effect on these assets are assessed to be **Moderate**, **Adverse**, and **Permanent**.

19.5.12 Effects of the operational phase derive from landscape changes associated with the permanent presence of the Proposed Development and Overall Project which change the setting of heritage assets in the study area. As the significance of effect will remain as determined for the construction phase, there is no need to reassess each asset or requirement for mitigation measures.

Biodiversity

19.5.13 Ecological features considered for the assessment in Chapter 9 (EIAR Volume I) include sites, habitats, or species with nature conservation importance. Effects on ecological features during the construction phase derive from interactions with the following environmental aspects: Air Quality (e.g., deposition of dust on aquatic habitats); Noise and Vibration (e.g., increased noise levels affecting notable species such as bats); Water Environment (e.g., changes in water levels affecting environmental stabilisation of the bare peat areas); Land, Soils and Geology (e.g., impacts to badgers and their setts due to excavation works); Traffic and Transport (e.g., pollution and/or sedimentation events due to construction traffic); and Waste Management (discussed under Chapter 16: Material Assets of EIAR Volume I) (e.g., hazardous waste not managed or stored correctly impacting habitats for qualifying interest species). Interactions between Biodiversity and other environmental aspects are numerous, complex, and detailed in full in Chapter 9: Biodiversity (EIAR Volume I). In addition, during the operational phase, there are also interactions between Biodiversity and MA&Ds (e.g., risk of mortality of notable species in the event of a MA&D) and Material Assets (e.g., bird mortality through collision with overhead lines).

19.5.14 With the implementation of mitigation measures presented in Chapter 9 and all other relevant chapters, residual effects for the Proposed Development and Overall Project will largely be considered to be **Imperceptible** or **Not Significant** with the exception of **Permanent, Negative,** and **Slight** effects on bats; **Short-Term, Negative,** and **Slight** effects to Amphibian populations; **Permanent, Negative,** and **Slight** effect on badger populations; **Permanent, Negative,** and **Slight** effects on breeding and wintering birds. These effects are at the Local geographic scale, although effects on birds extend to a County geographic scale as well.

19.5.15 Biodiversity and Landscape and Visual interactions are discussed under the Landscape and Visual section.

Landscape and Visual

19.5.16 Landscape and Visual interactions with Traffic and Transport during the construction phase are due to temporary, adverse effects of construction traffic and signage upon the local landscape and views. There will also be interactions with Land, Soils, and Geology from the disturbance and compaction of surfaces and presence of soil storage areas during excavation and earthworks, and interactions with Biodiversity from the loss or damage to existing vegetation and habitat.

19.5.17 During the operational phase, there will be interactions between Landscape and Visual and Material Assets from to the introduction of industrial components of the Proposed Development and Overall Project into the landscape (noticeable vertical elements in particular), which will result in an adverse effect. There is also potential for interactions with Air Quality due to visible plumes from the OCGT and CCGT; however, the risk of significant or prolonged visible plumes is low.

19.5.18 Landscape mitigation measures for the Proposed Development focus on architectural mitigation such as façade treatment and minimising lighting during night-time, in addition to additional planting proposed to integrate the facility where possible. Although increased planting has a positive interaction with Biodiversity, overall mitigation

measures will not reduce the effects identified on the Landscape and Visual assessment. The significance of construction and operational effects for the different elements of the Proposed Development and Overall Project vary depending on variables such as distance from visual receptors and existence of intervening vegetation, and range from **None** to **Significant**. These effects are detailed in Chapter 10: Landscape and Visual of EIAR Volume I.

Noise and Vibration

19.5.19 Chapter 14 (Traffic and Transport) determines the routes traffic will travel to and from the various access points of the Proposed Development and Overall Project (refer to Section 14.2 of Chapter 14 EIAR Volume I for a full description of routes and access points relevant to each element of the Proposed Development and Overall Project). There are a number of receptors along these routes which have the potential to be impacted by increased noise levels associated with construction traffic. However, the assessment of noise effects relating to construction traffic concluded that residual effects on residential receptor positions will be **Negative**, **Imperceptible** and **Short-Term**.

19.5.20 Additionally, there is potential for interactions with Land, Soils and Geology associated with construction activities such as excavations and earthworks which can result in noise and vibration impacts on sensitive receptors. However, these effects are considered to be **Not Significant**, **Negative** and **Short-Term** to **Temporary**.

19.5.21 Noise and Vibration interactions with Cultural Heritage, Biodiversity, Landscape and Visual, and Population and Human Health are discussed under the relevant sections.

Water Environment

19.5.22 During the construction phase, there is potential for Water Environment interactions with Lands, Soils, and Geology (for example, due to the release of sediments from disturbed and excavated soils into catchment areas); Traffic and Transport (due to accidental spillage or leakage of oils and fuels from construction machinery or site vehicles); Waste Management (discussed under Chapter 16: Material Assets of EIAR Volume I) (for example, due to the incorrectly stored or management waste entering waterbodies); and Climate (due to exposed soils increasing the risk of flood from pluvial sources).

19.5.23 During the operational phase, there is potential for Water Environment interactions with Land, Soils, and Geology (from increased surface water runoff from new impervious areas); Waste Management (from small quantities of oils and chemicals delivered to the site); MA&Ds (from the release of toxic substances to water environments in the event of a MA&D); and Climate (due to the potential for flooding based on a future climate change scenario).

19.5.24 The overall risk of fluvial flooding for the Proposed Development and Overall Project is considered to be low. Similarly, construction activities are considered to result in an **Imperceptible** effect on the risk of increased pluvial flooding. In addition, with the implementation of mitigation measures described in Chapter 12: Water Environment (refer to EIAR Volume I) and the CEMP prepared for this application (Appendix 5A of EIAR Volume II), all residual effects on the Water Environment are considered to be **Imperceptible.**

19.5.25 Water Environment interactions with Cultural Heritage, Biodiversity, Land, Soils and Geology, and Population and Human Health are discussed under the relevant sections.

Land, Soils and Geology

19.5.26 Land, Soils and Geology interactions with other environmental aspects during the construction phase include Water Environment (associated with impacts on the geological environment from dewatering of excavations); Traffic and Transport (associated with disturbance of soils or accidental spillage or leakage of oils and fuels from construction machinery or vehicles); and Waste Management (discussed under Chapter 16: Material Assets of EIAR Volume I) (e.g., hazardous waste not managed or stored correctly impacting soils). With the implementation of embedded and proposed mitigation measures outlined in Chapters 13: Land, Soils, and Geology as well as other relevant chapters, including implementation of the CEMP and CTMP, effects on Land, Soils, and Geology will ranging from **Imperceptible** to **Moderate Adverse**.

19.5.27 During the operational phase, MA&Ds could result in the release of potentially dangerous or hazardous substances in soils. However, Chapter 18: MA&Ds identified that the design of the Proposed Development and Overall Project will incorporate appropriate standards and mitigation measures necessary to reduce the risks of accidents and disasters to an acceptable level. In addition, the assessment in Chapter 7: Air Quality (refer to EIAR Volume I) identified no significant effects associated with the deposition on soil of pollutants from the Power Plant stacks; therefore, there will be no interactions with Air Quality and Land, Soils, and Geology.

19.5.28 Land, Soils and Geology interactions with Cultural Heritage, Biodiversity, Landscape and Visual, and Population and Human Health are discussed under the relevant sections.

Traffic and Transport

19.5.29 The interaction between Traffic and Transport and Waste Management (discussed under Chapter 16: Material Assets of EIAR Volume I) is associated with the disposal of waste. During the design process, every effort has been made to balance the import and export volumes of materials thereby minimising construction traffic generation in the first instance. In addition, an Outline Construction Environmental Management Plan (CEMP), a Peat and Spoil Management Plan (PSMP), and Outline Construction Traffic Management Plan (CTMP) (Appendices 5A, 5B, and 14H of EIAR Volume II, respectively) have been prepared to mitigate negative impacts on the environmental during the construction phase. As a result of the implementation of mitigation, residual impacts from material imports and exports on construction traffic will be **Not Significant**.

19.5.30 During the operational phase, small quantities of oils and chemicals (i.e., lubrication oils, propane, CO_2 cleaning agents and glycol / antifreeze) will also be delivered to the Power Plant Area. Such chemicals may result in small quantities of operational waste. However, operational waste impacts from the Proposed Development and Overall Project are expected to be **Negligible**.

19.5.31 Traffic and Transport interactions with Air Quality, Cultural Heritage, Biodiversity, Landscape and Visual, Noise and Vibration, Water Environment, Population and Human Health, MA&Ds, and Climate are discussed under the relevant sections.

Population and Human Health

19.5.32 During the construction phase of the Proposed Development and Overall Project, there is potential for interactions with Air Quality and Land, Soils, and Geology (from construction works such as excavation and earthworks resulting in dust emissions and poor air quality); Noise and Vibration, and Traffic and Transport (from construction traffic and works noise impacting local receptors); Waste Management (discussed under Chapter 16: Material Assets of EIAR Volume I) (from the incorrect management of waste resulting in littering that can cause a nuisance to the public and attract vermin); and

MA&Ds (for example, due to fatal injuries sustained by construction staff working in proximity to high voltage electricity).

19.5.33 Potential operational phase interactions with Population and Human Health and other environmental aspects include Air Quality (from the increased concentration of air pollutants associated with the Power Plant stacks); Landscape and Visual (due to the permanent introduction of industrial elements into the landscape); Noise and Vibration (associated with noise emissions from the elements of the Proposed Development such as the Power Plant and electrical substations); Water Environment (due to changes in water quality as a result of proposed discharges); MA&Ds (given their potential to result in harm to human health); and Climate (due to increased emissions and their effect on climate change which a determinant of human health and well-being).

19.5.34 Taking into consideration adherence to the mitigation measures outlined in Chapter 15: Population and Human Health (refer to EIAR Volume I) and all other relevant chapters (including, for example, implementation of the CEMP, CTMP and Bord na Móna's Community Gain Scheme), there will be no negative residual impacts or effects on Population and Human Health during the construction or operational or decommissioning phases of the Proposed Development and Overall Project.

Material Assets

19.5.35 Interactions between Material Assets and Climate relate to damage to infrastructure or reduced efficiency in operational plant and equipment due to changes in climate variables (e.g., extreme heat or rainfall) linked to climate change. However, the assessment concluded that the likelihood of these risks is **Rare** or **Unlikely**, and that effects are **Not Significant**. Similarly, MA&Ds have the potential to result in damages to infrastructure; however, the assessment of MA&Ds identified no likely significant effects.

19.5.36 Material Assets and Waste Management interactions with Cultural Heritage and Archaeology, Biodiversity, Landscape and Visual, Noise and Vibration, Traffic and Transport, Population and Human Health, and Climate are discussed under the relevant sections.

Major Accidents and Disasters

19.5.37 During the construction phase, there is potential for interactions between MA&Ds and Traffic and Transport. Hazards associated with construction traffic include the potential for collisions and the risk of an abnormal or heavy load from falling from its transport vehicle onto the road network. An Outline CTMP and Abnormal Loads Reports (Appendices 14H and 14B of EIAR Volume II, respectively) have been prepared for the Proposed Development and Overall Project. With the implementation of mitigation measures discussed in these appendices as well as Chapter 14: Traffic and Transport (EIAR Volume I), these events would be considered unlikely to occur and no significant residual effects were identified.

19.5.38 MA&Ds and Climate interactions refer to changes in climate variables linked to climate change resulting in MA&Ds (e.g., increased temperatures resulting in operational instability of certain components of the Power Plant Area). However, as stated in the previous section, an initial climate change risk assessment concluded that the likelihood of these risks is **Rare** or **Unlikely**, and that effects are **Not Significant**, and the assessment of MA&Ds also found residual effects to be **Not Significant**.

19.5.39 MA&Ds interactions with Air Quality, Biodiversity, Water Environment, Land, Soils and Geology, Population and Human Health, and Material Assets are discussed under the relevant sections.

Climate

19.5.40 During the construction phase of the Proposed Development and Overall Project, there will be Climate interactions with Air Quality and Traffic and Transport associated with GHG emissions impacting climate change, which originate from the manufacturing of raw materials, transportation to and from the site of materials and waste, and emissions from construction activities (e.g., fuel use). An Outline CTMP and Outline CEMP have been prepared as part as this planning application to mitigate negative impacts on the environmental during the construction phase. With the implementation of these plans as well as good practice measures as discussed in Section 18.6 of EIAR Volume I Chapter 18: Climate, residual GHG effects of the construction phase of the Proposed Development and Overall Project are deemed '**Minor Adverse**' and therefore '**Not Significant'**.

19.5.41 Similarly, interactions between Climate and Air Quality during the operational phase are associated with GHG emissions from the operation of the Proposed Development and Overall Project. The effects of these emissions are partially mitigated by good practice and embedded mitigation measures discussed in Chapter 18. The residual GHG effects of the construction phase of the Electricity Grid Connection and the Gas Connection Corridor are deemed '**Minor Adverse**' and therefore '**Not Significant'**. When viewed in isolation, the residual operational GHG emissions of the Power Plant Area can be classified as '**Moderate Adverse**' and '**Significant**'. However, the Proposed Development will provide support to the electricity supply system at times of peak demand, which would contribute to providing a secure energy supply to the national grid. It is reasonable therefore to view the Power Plant Area not as an isolated, standalone piece of generating capacity but as an element within an interconnected system that will be part of a wider move to replace existing, unabated high-carbon electricity generation installations. In addition, the Power Plant has been designed with the capability to run on hydrogen blend fuels, should this become a feasible fuel option in future[2]. This makes the Power Plant adaptable to a low-carbon fuel source in line with Ireland's net-zero trajectory. Therefore, the residual GHG effects of the Power Plant Area can be said to be '**Minor Adverse'** and therefore '**Not Significant'**, as it does comply with existing and emerging policy requirements and is fully in line with Ireland's trajectory towards net zero.

19.5.42 Climate interactions with Biodiversity, Water Environment, Population and Human Health, Material Assets, and MA&Ds are under the relevant sections.

[2] While there is future potential to run the Power Plant on a blend of hydrogen, it is not proposed as part of this planning application, nor is it assessed or modelled in this EIAR. Any future use of hydrogen at a later date will be subject to a detailed assessment and separate planning application.

19.6 References

Environmental Protection Agency (EPA) (2022). *Guidelines on the information to be contained in Environmental Impact Assessment Reports*.

European Union (2014). *Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.*

European Union Planning and Development (Environmental Impact Assessment) Regulations 2018 S.I. No. 296 of 2018.

Government of Ireland (GOI) (2018). *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*.

Institute of Environmental Management and Assessment (IEMA) (2022). *Assessing Greenhouse Gas Emissions and Evaluating their Significance.* Available at: https://www.iema.net/preview-document/assessing-greenhouse-gas-emissions-and-evaluating-their-significance#:~:text=GHG%20emissions%20should%20be%20assessed,increase%20or%20decrease%20in%20emissions