

Shannon Technology and Energy Park (STEP) Power Plant

Environmental Impact Assessment Report - Volume 2
Chapter 18 Interactions

Shannon LNG Limited

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18. Interactions

18.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) evaluates the potential interaction of effects described within this EIAR, which the Proposed Development may have on the receiving environment and sensitive receptors.

An evaluation of the interaction of effects is a requirement set out in Article 3 (1) of Directive 2011/92/EU of the European Parliament and the Council on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU (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; and*
- (e) the interaction between the factors referred to in points (a) to (d).”*

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.”

The interaction of effects within the Proposed Development in respect of each of the environmental factors, listed in Article 3 (1) of the EIA Directive, have been identified and addressed in detail in the respective chapters in this EIAR. This chapter presents a summary of each assessment of the interaction (or inter-relationship) of impacts, from the Proposed Development, between the various environmental factors.

A summary of the interactions (or inter-relationship) of effects identified from the Proposed Development between the following environmental aspects are outlined in this chapter:

- Land, Soils and Geology.
- Water.
- Biodiversity (Marine Ecology and Terrestrial Ecology).
- Air Quality.
- Airborne Noise and Groundborne Vibration.

- Landscape and Visual.
- Traffic and Transport.
- Cultural Heritage.
- Population and Human Health.
- Major Accidents and Disasters.
- Climate.
- Waste Management.
- Material Assets.

All potential effects arising from the interactions were identified early in the design process and in preparation of the EIAR and were therefore addressed in the design of the Proposed Development, in addition to the impact assessment studies. As a result, any potential effects were either avoided through design measures or have been addressed through specific mitigation and monitoring measures reported within respective chapters of this EIAR.

No additional mitigation or monitoring measures are proposed in this chapter.

18.2 Land, Soils and Geology

Land, soils and geology interactions are summarised under the following sections.

18.2.1 Water

Various construction activities have the potential to release sediment and cause unacceptable sediment levels in receiving watercourses; for example, site stripping and bulk earthworks, which will potentially lead to increases in sediment loading of the drainage network or direct runoff to the estuary or to the Ralappane Stream and its tributaries. Contamination from suspended sediments may also be caused by runoff from material stockpiles.

It was determined that the mitigation measures outlined in **Chapter 05** (Land, Soils and Geology) will minimise the potential for any adverse impacts from the Proposed Development to water features in the area. It was therefore determined that residual effect significance from the Proposed Development will be **Imperceptible** and **Not Significant**, provided that appropriate mitigation measures are applied (as specified in **Chapter 05** and the Construction Environmental Management Plan (CEMP), refer to refer to **Appendix A2.3**, Volume 4.

18.2.2 Biodiversity

Land take will result in the loss of a number of habitat types including hedgerows, treelines and sedimentary sea cliffs in order to facilitate the construction of the Proposed Development.

A number of species are expected to be affected within the study area, including otter, badger, bats, hare, breeding and estuarine (winter) birds and frogs, due to habitat loss and reduction in foraging resources.

With the implementation of a number of mitigation measures, including landscape planting, this will likely reduce the significance of likely significant effect from land take on a number of species within the

study area. In addition, replacement planting of native tree species will provide replacement habitat for bats. Residual impacts on habitats as a result of the land take will remain **Negative, Long-Term** and **Not Significant**.

18.2.3 Air Quality

Various construction activities, including earthworks and movement of material on and offsite have the potential to create negative impacts on air quality sensitive receptors from dust arising during the construction phase. It was concluded in **Chapter 08** (Air Quality) that, provided best practice Site construction dust mitigation measures and a proportionate level of site boundary dust monitoring are implemented onsite (all of which are common practice on well managed construction sites) potential impacts can be adequately controlled to the extent that any impact is **Not Significant**. The final list of mitigation measures to be taken forward during the construction works will be defined within the CEMP, refer to **Appendix A2.3**, Volume 4.

18.2.4 Airborne Noise and Groundborne Vibration

Movement of excavated materials onsite can result in noise and vibration impacts to sensitive receptors surrounding the Site during the construction phase. However, with the implementation of the identified mitigation measures and long-term noise monitoring outlined in **Chapter 09** (Airborne Noise and Groundborne Vibration) and the CEMP (**Appendix A2.3**, Volume 4), **No Adverse** impacts on sensitive receptors located close to the Site are predicted.

18.2.5 Landscape and Visual

It is considered that the emergence of new structures within an extended area of construction activity will be the most visually prominent aspect of the construction works relating to the Proposed Development. Views of the construction area and associated earthworks will be partly restricted due to the undulating nature of the topography within County Kerry part of the study area.

Landscape and visual effects will therefore range from **Low** to **High** and their significance from **Slight Neutral** to **Significant Adverse** but **Temporary-Short-Term** depending on the distance to the Proposed Development and the extent of intervening topography and vegetation.

18.2.6 Cultural Heritage

Groundworks associated with the construction of the Proposed Development will likely impact upon a number of known cultural heritage assets and any previously unrecorded archaeological assets, should they exist, and will alter the special interests or qualities of an asset. For example, groundworks associated with the Proposed Development will result in **Significant** impacts on an unoccupied and derelict farm complex, an abandoned gun emplacement and a well as these will be permanently removed to facilitate the construction of the Proposed Development, altering their special interests and qualities.

Archaeological testing in 2008 revealed 60 Areas of Archaeological Potential. Of these, 31 Areas of Archaeological Potential are located within the footprint of the Proposed Development. These 31 sites will undergo archaeological excavation to determine if they are of importance before any construction activities begin onsite.

Mitigation has been proposed to reduce likely significant effects which will ensure any archaeological and architectural assets are identified and recorded to best practice, thereby enriching the known heritage of County Kerry.

18.2.7 Population and Human Health

During construction, excavations and earthworks, temporary stockpiling of potentially dusty materials, cutting and grinding of materials and cement, use of unsurfaced haul roads and construction traffic haul roads could result in some temporary air quality, noise and neighbourhood amenity impacts.

Appropriate mitigation measures outlined in **Chapter 05** (Land, Soils and Geology), will likely result in **No Significant Negative** effects during the construction phase.

18.2.8 Climate

Construction activities such as land clearance and land use change can affect greenhouse gas (GHG) emissions resulting from a loss of a carbon sink. There will be unavoidable GHG emissions resulting from the construction phase of the Proposed Development.

Removal of vegetation during land clearance and ground disturbance could also increase the likelihood or severity of flooding after extreme rainfall. Further, land, soils and geology have the potential to be impacted due to sea level rise and changes to storm patterns. This reduction in climate change resilience has the potential to negatively affect the Proposed Development by causing additional costs onsite through damage or loss of any materials stockpiles and reducing Site access.

However, with embedded mitigation measures and identified mitigation measures, as outlined in **Chapter 15** (Climate). **No Significant** effects from GHG emissions on land, soils and geology were identified.

18.3 Water

Water interactions are summarised under the following sections.

18.3.1 Land, Soils and Geology

The embedded mitigation measures outlined in **Chapter 02** (Description of the Proposed Development), including the provision of an attenuation system with a Class 1 interceptor and effluent treatment in a packaged Waste Water Treatment Plant (WWTP) prior to discharge to water under an Industrial Emissions (IE) licence conditions and monitoring requirements, will minimise the potential for adverse impacts to soils and groundwater from drainage, process / sanitary effluent and chemical / fuel storage from the Proposed Development during the operational phase. A discharge licence will be required for the temporary construction phase storm water discharges to the estuary. As such, **No Significant** effects on receiving land, soils and geology environment are anticipated.

18.3.2 Biodiversity

As outlined in **Chapter 07B** (Terrestrial Ecology), potential impacts on water quality could arise from mobilised suspended solids as well as spillage of fuels, lubricants, hydraulic fluids and cement from construction plant. In the absence of appropriate mitigation measures, site stripping, earthworks and material stockpiles associated with the construction could potentially give rise to a high degree of solids washout which could discharge into the local drainage network and the Ralappane Stream.

Silt generated during the construction phase could potentially interfere with spawning of Stone Loach and Stickleback smothering spawning habitat and deposited eggs and newly hatched larvae. If sufficient quantities of silt enter local watercourses it could potentially settle on the bottom, smothering benthic flora, ultimately affecting faunal feeding and breeding sites. However, with the implementation of mitigation measures as outlined in **Chapter 06** (Water), the significance of impacts will likely reduce and residual impacts are predicted to be **Imperceptible**.

A bridge will cross the Ralappane Stream and there are two drainage ditches within the Site, which will be culverted. The bridging works could potentially indirectly affect existing fish stocks via impacts on water quality. However, it is noted that this stream is small with limited fish stocks and it is unlikely to be a significant source of prey for Otter. The drainage ditches do not support fish species, are unlikely to provide significant breeding habitat for Common Frog and therefore have Negligible value for Otter foraging.

Should sediments be released to the Shannon Estuary, the impact of increased turbidity, if realised, will be short lived with the local currents in the immediate area resulting in sediment being rapidly removed from the system and significant sediment deposition in the area will not occur. In the event of significant release of sediment from the construction works, local currents are such that any localised deposition of sediment will be short lived with sediments rapidly dispersed seaward. As discussed in **Chapter 07A** (Marine Ecology), excessive suspended sediments can cause stress and affecting the gills of fish, resulting in injury or mortality and the loss of suitable fish spawning habitat and declines in egg and early life stage success rates.

As discussed in **Chapter 07A** (Marine Ecology), through the implementation of construction best practice and mitigation and monitoring measures, the risk of activities during the construction resulting in the uncontrolled release of sediment material to the nearby river and habitat types is extremely unlikely to occur.

18.3.3 Cultural Heritage

Chapter 12 (Cultural Heritage) notes the presence of areas of archaeological potential which are located outside, but adjacent to the Proposed Development. These areas of archaeological potential contain sub-surface features and deposits which could be affected by changes in the local water table arising from construction works. These impacts could include desiccation of archaeological features and artefacts by the removal of water. It is considered that adverse impacts to soils are not anticipated during the construction and operational phases. As such, the likely significance of effects will likely reduce and residual impacts are predicted to be **Imperceptible** and **Neutral**.

18.4 Biodiversity

Biodiversity interactions are summarised below. Additional interactions with air quality, noise and climate are identified in the sections that follow. The Proposed Development will be operated under the conditions of an IE licence and incorporate ongoing monitoring through construction and operation.

18.4.1 Landscape and Visual

Chapter 10 (Landscape and Visual) notes that the Proposed Development will retain existing screening vegetation onsite where possible. A detailed landscape mitigation plan indicates the retention of existing vegetation including hedgerows and proposes new planting along the entrance road minimising the impact on vegetation cover within the area and supporting the integration of the Proposed Development into its environs. It is considered that the proposed landscape planting will mitigate the majority but not all of the likely **Moderate / Significant, Adverse** visual effects.

18.4.2 Population and Human Health

Biodiversity and the natural environment are considered to be a determinant of health, when health is defined broadly as encompassing general wellbeing, not just the absence of illness. There may be opportunities for the Proposed Development to maintain or enhance biodiversity, or for potential negative impacts to be mitigated.

Chapter 13 (Population and Human Health) therefore considers biodiversity as part of its assessment of human health impacts. It is however acknowledged that many habitats and species will have limited / no direct interaction with humans and so potential impacts will be indirect or limited.

18.5 Air Quality

Air quality interactions are summarised under the following sections.

18.5.1 Biodiversity

As outlined in **Chapter 07B** (Terrestrial Ecology), air quality impacts from construction works on sensitive ecological receptors may include the deposition of dust on vegetation, within watercourses or protected habitats *i.e.*, Lower River Shannon Special Area of Conservation (SAC) / River Shannon and River Fergus Estuaries Special Protection Area (SPA) and Ballylongford Bay pNHA.

However, the assessment has noted that the majority of the SAC / SPA within 50 m of the construction Site boundary is tidal estuary which provides high levels of dilution, construction works will be located are over 80 m from Ballylongford Bay pNHA and no impacts are predicted to occur to habitats in the pNHA. No rare species or habitat which are sensitive to air quality impacts are located within the Site.

In the absence of mitigation, the impact from dust deposition effect on terrestrial, freshwater and estuarine habitat during construction will be **Short-Term** and **Not Significant**, at a local geographic scale.

The operational of the Proposed Development will include a number of sources with emissions to air associated with the CCGT and other energy generating combustion plant onsite. Emissions to air associated with such plant vary with the type of plant and its purpose, the thermal capacity of the plant and the fuel used to enable combustion.

As detailed in **Chapter 08** (Air Quality), the long-term cumulative impacts at the nature conservation receptors are screened as **Insignificant** for locations where the cumulative PC for all pollutants considered is less than 1% of the relevant air quality standards or Critical Loads.

The Proposed Development will be operated under the conditions of an IE licence and ongoing monitoring throughout operation. Details of the proposed mitigation and monitoring measures are provided in **Chapter 08** (Air Quality) and the CEMP (**Appendix A2.3**, Volume 4). Therefore, **No Significant** impacts on ecological receptors from operational air emissions are predicted to occur.

18.5.2 Cultural Heritage

Dust generated from a number of construction activities may affect the setting of cultural heritage assets identified within close proximity to the Site. As discussed in **Chapter 12** (Cultural Heritage), Ralappane House (RPS KY 003-001) is located to the south of the Proposed Development, and although this asset will not be physically impacted by the Proposed Development, there is the possibility of a **Negative** effect to the setting of the designated assets by dust from construction related traffic which may diminish the importance of this asset. This effect will be **Short-Term** and will cease once construction is complete. In addition to this, during the construction phase, procedures will be adopted, as described in the CEMP (**Appendix A2.3**, Volume 4), to ensure that archaeological areas and sites are protected during construction.

18.5.3 Population and Human Health

During the construction phase, construction activities including excavations and earthworks, temporary stockpiling of potentially dusty materials may result in some temporary air quality and neighbourhood amenity effects.

There is a risk of potential odour emissions from fugitive sources during the operation of the Proposed Development. Provided the appropriate air quality mitigation measures are followed, the potential health effect during construction and operational phases due to dust and odours is assessed to be **Neutral**.

18.5.4 Climate

There will be unavoidable GHG emissions resulting from the construction and operational phases of the Proposed Development as materials, energy and fuel use, and transport will be required. However, with embedded mitigation measures their effects have been assessed as **Slight Adverse**.

The fuel consumption associated with the operating of the Proposed Development would contribute the majority of the operational phase emissions. Operational emissions have been assessed as **Major Adverse**. Further, the specifications of the Proposed Development are such that it would be required to have a GHG Permit, to submit annual emissions reports and to surrender sufficient EU Allowances to cover its annual emissions under the terms of the EU Emissions Trading System.

However, it is acknowledged however that without a supply of gas-powered electricity generation, Ireland would not meet its 80% by 2030 renewable energy electricity target, in turn allowing Ireland to meet its national carbon reduction target. It is important to note that the emissions associated with the Proposed Development could reduce over time based upon projected running hours. Additionally, the

Proposed Development has the potential to transition fuel sources from natural gas to lower carbon fuels (*i.e.* hydrogen) to further assist in the pathway towards net zero.

18.6 Airbourne Noise and Vibration

Noise and vibrations interactions are summarised under the following sections.

18.6.1 Biodiversity

During the construction phase it is noted that main sources of noise and vibration associated with the construction of the Proposed Development are the blasting within terrestrial habitats and rock breaking along the cliff / estuary during the construction of the drainage outfall pipe, as outlined in **Chapter 07B** (Terrestrial Ecology). Vibration levels are expected to be highest during blasting operations, however these will be carefully managed.

Noise and lighting during the construction phase has the potential to significantly impact foraging habitats of local bat populations. Noise and vibration levels during the construction phase has potential to cause disturbance to bats, otters, foraging birds, badger and wintering birds.

However, during the construction phase, noise levels will fall off quickly outside the Site boundary even during peak construction works. While this may create a disturbance to birds within the SPA, mammals and habitats, this will be **Temporary** and **Not Significant**.

With the implementation of mitigation measures, as described in the CEMP (**Appendix A2.3**, Volume 4), and in **Chapter 09** (Airborne Noise and Groundborne Vibration), the risk of **Significant, Adverse** impacts from the noise and vibration during the construction phase will be **Imperceptible**.

During the operational phase, noise generated from the Proposed Development may also disturb or displace badgers from favoured foraging habitats, bats and otters, hedgehogs and birds, resulting in **Long-Term, Negative** effects on these sensitive ecological receptors.

However, following mitigation, peak operational noise levels will be 45-55 dB(A) along the along the Shannon Estuary shoreline adjacent to the Site. To the east and west of the Site, noise levels will be 35-40 dB(A) falling to <35 dB(A) west of Knockfinglas Point. In the subtidal waters within the immediate vicinity of the Proposed Development, noise levels following mitigation will be <55 dB(A). Waders and waterfowl in the Shannon Estuary are likely to habituate to operational noise and disturbance and continue to forage along the intertidal and sub-tidal habitats.

As outlined in **Chapter 07A** (Marine Ecology), there is potential that controlled rock blasting on land will generate underwater noise disturbance. Sound levels will be low with the only predicted impact being on pinniped species within 75 m from the shoreline. Thus, any effects from the Proposed Development activities are expected to be **Minor, Temporary**, and localized to the area immediately around the Proposed Development, with **No Significant Long-Term** effects on marine mammal or fish populations.

18.6.2 Cultural Heritage

As discussed in **Chapter 12** (Cultural Heritage), Ralappane House (RPS KY 003-001) is located to the south of the Proposed Development. There is the possibility of negative effects to the setting of the designated asset by noise and vibration from construction related traffic and onsite construction activities which can diminish the importance of this asset. This effect will be **Short-Term** and will cease

once construction is complete. In addition to this, during the construction phase, procedures will be adopted, as described in the CEMP (**Appendix A2.3**, Volume 4), to ensure that archaeological areas and sites are protected during construction.

18.6.3 Population and Human Health

Construction activities can result in noise and vibration impacts to sensitive receptors surrounding the Site during the construction phase. However, with the implementation of the identified mitigation measures and long-term noise monitoring outlined in **Chapter 09** (Airborne Noise and Groundborne Vibration) and the CEMP (**Appendix A2.3**, Volume 4), **No Significant Adverse** effects on sensitive receptors are predicted from onsite construction activities.

As noted in **Chapter 09** (Airborne Noise and Groundborne Vibration) a minor, negligible or no-change increase is expected on the majority link during the construction phase, except for Link 2 (L1010 road – Site entrance to Tarbert) where a **Moderate** increase is predicted. This impact is limited to the relatively small number of noise sensitive properties located along this stretch of existing road.

18.7 Landscape and Visual

Landscape and visual interactions are summarised under the following sections.

18.7.1 Biodiversity

As outlined in previous sections, replacement woodland planting may provide some replacement habitat for bats, and species including hedgehogs will likely recolonise the Site following this planting. The residual impact on these species is therefore expected to be **Negative, Slight** and **Long-Term** following the implementation of the Landscape Masterplan, refer to **Appendix F2.3**, Volume 3.

18.7.2 Population and Human Health

Visual effects will mainly relate to the introduction of large turbine halls and ancillary buildings including storage tanks. The main visual receptor groups are residents and vehicle travellers including ferry passengers, workers, visitors / tourists. Residents will have the highest sensitivity to change than the road users or ferry passengers. Vehicle travellers and workers will focus on traffic or their commercial tasks and not primarily on available views.

Ship passengers will see the Proposed Development in conjunction with the prominent existing Tarbert Power Station and Moneypoint Power Station structures. As discussed in **Chapter 11** (Landscape and Visual), the Proposed Development is located in a prominent setting along the shoreline of the Shannon Estuary with a low rise but undulating landscape as a backdrop, particularly when seen from the County Clare side. The principal landscape and visual mitigation measures for the Proposed Development is therefore inherent in the design of its architecture and its colour scheme. Landscape mitigation measures have been developed in order to screen the lower sections of the proposed range of buildings and the proposed access road to help the integration into the landscape.

18.7.3 Climate

Climate change interacts a number of ways with landscape and visual sensitivities. Landscaping will increase terrestrial carbon sinks and reduce the net GHG emissions from the Proposed Development.

In addition to this, landscaping will aid mitigation of climate change risks to the Proposed Development by reducing air temperatures and flooding impacts.

Landscaping will help mitigate the effects of combined Development-rated climate change impacts to biodiversity by creating habitats for flora and fauna.

18.8 Traffic and Transport

Traffic and transport interactions are summarised under the following sections.

18.8.1 Land, Soils and Geology

As noted in **Sections 18.2** and **18.3**, accidental spillage or leakage of oils and fuels from construction machinery or site vehicles may potentially result in the impact of soils underlying the Site if inappropriately handled or stored. Potential contaminants could migrate through the subsoils and impact underlying groundwater.

However, with the implementation of mitigation measures outlined in **Chapter 05** (Land, Soils and Geology) it was determined that the likelihood and magnitude of the potential effects on land, soils and geology occurring during the construction phase will significantly reduce. It was therefore determined that residual significance to land, soils and geology from accidental spillage and leaks will be **Imperceptible** provided that appropriate mitigation / control measures as specified is applied.

Accidental spillage or leakage of the secondary fuel supply (distillate oil) during routine deliveries during the operational phase may potentially result in the impact of soils underlying the Site.

However, with the implementation of mitigation measures outlined in **Chapter 05** (Land, Soils and Geology) it was determined that the likelihood and magnitude of the potential effects on land, soils and geology occurring during the deliveries of fuel during the operational phase will significantly reduce. It was therefore determined that residual significance to land, soils and geology from accidental spillage and leaks will be **Slight** provided that appropriate mitigation / control measures as specified is applied.

18.8.2 Water

There is risk of pollution due to accidental spillage and leaks from vehicles, during the operational phase, as well as fuel spillages from machinery operating close to watercourses during the construction phase.

However, the mitigation measures outlined in **Chapter 06** (Water), in addition to the embedded mitigation measures that have been included in the design, will minimise the potential for any adverse impacts to receiving watercourses both during the construction and operational phases of the Proposed Development. It was therefore determined that residual impact to water from accidental spillage and leaks will be **Imperceptible** provided that appropriate mitigation / control measures as specified are applied.

18.8.3 Biodiversity

As noted above in **Section 18.3.2**, potential impacts on water quality, during the construction phase could arise from spillage of fuels, lubricants, hydraulic fluids and cement from construction traffic and plant. This has the potential to impact negatively on fish and aquatic vertebrates. However, with the

implementation of mitigation measures outlined in **Chapter 06** (Water), the significance of effects will likely reduce and residual impacts are predicted to be **Imperceptible**. As outlined in **Chapter 07B** (Terrestrial Ecology), potential impacts on water quality

18.8.4 Air Quality

During the construction phase, construction traffic will likely generate dust which may result in negative effects on sensitive receptors within 50 m of a public road used by construction traffic (within 500 m of the Site entrance), including residential dwellings adjacent to the L1010 road. With the implementation of appropriate mitigation measures, the residual effects significance from dust impacts was identified as **Imperceptible** and **Neutral**.

During the operational phase, there will be emissions to air from road traffic entering and existing the Site. The assessment identified that cumulatively emissions to air from road traffic with Site emissions will likely result in **Imperceptible** to **Slight Adverse** residual effects.

18.8.5 Noise and Vibration

Noise generated by changes to traffic flows on existing road will likely result in negative noise and vibration effects on sensitive receptors located close to the Site. During the operational phase, **Long-Term** impacts associated with noise generated by changes to traffic flows on existing roads will likely occur.

However, with the implementation of identified mitigation measures outlined in **Chapter 09** (Airborne Noise and Groundborne Vibration) **No Significant Adverse** effects on sensitive receptors located close to the Site are predicted, with the exception of one likely **Short-Term Significant** impact with regard increased traffic flows during the construction phase on the L1010 road between the Site entrance and Tarbert.

18.8.6 Landscape and Visual

Increased vehicular traffic as a result of the Proposed Development will affect views for receptors such as residents or tourists during both construction and operation, particularly along scenic roads, protected views and prospects as well as the Wild Atlantic Way touring route. As discussed in **Chapter 10** (Landscape and Visual), residents will have the highest sensitivity to change than the road users or ferry passengers. Vehicle travellers and workers will focus on traffic or their commercial tasks and not primarily on available views. At some viewpoints, the Proposed Development will be screened from view by intervening vegetation, however a residual **Moderate-Significant Adverse** effect will remain at some locations as the Proposed Development will increase the prevalence of large industrial infrastructure in the landscape.

18.8.7 Cultural Heritage

The change in traffic on the existing road network as a result of the Proposed Development during the construction and operational phase will likely affect the setting of cultural heritage assets identified within / close to the Site. It was also identified that archaeological deposits may be compacted due to construction traffic movement or materials storage and / or damage through rutting of superficial deposits from construction traffic.

As discussed in **Chapter 12** (Cultural Heritage), there is the possibility of negative effects to the setting of Ralappane House (RPS KY 003-001) is located to the south of the Proposed Development as a result of the construction traffic which could diminish the importance of this asset. This effect will be **Short-Term** and will cease once construction is complete. In addition to this, during the construction phase, procedures will be adopted, as described in the CEMP (**Appendix A2.3**, Volume 4), to ensure that archaeological areas and sites are protected during construction.

The assessment also identified that all physical effects to known and unknown heritage assets will occur during the construction phase and there is no requirement for mitigation measures during the operational phase.

18.8.8 Population and Human Health

As outlined in **Chapter 13** (Population and Human Health), the presence of construction traffic has potential to lead to severance between residential properties and the workplaces, community facilities and educational facilities which they frequently access.

The Proposed Development was assessed to have a **Negligible** impact on severance between local residents in the study area and the facilities which they use during the construction phase. The additional construction traffic from the Proposed Development is not expected to result in any congestion considerable enough to deter local residents from accessing the workplaces, educational facilities or community facilities which they use.

No additional effects from additional traffic on the existing road network on Population and Human Health during the construction and operational phase were identified during the assessment.

18.8.9 Climate

As outlined in **Chapter 15** (Climate), there will be GHG emissions resulting from both the construction and operational phase of the Proposed Development, from the introduction of construction vehicles and commuter vehicles during operation. With the implementation of identified mitigation measures during the construction, impacts associated with construction vehicles will likely not result in any adverse effects on climate.

There would be unavoidable GHG emissions resulting from commuter vehicles during the operational phase of the Proposed Development. No mitigation measures have been proposed to reduce or offset the effects from these emissions.

18.9 Major Accidents and Disasters

18.9.1 Land, Soils and Geology / Water / Biodiversity / Air / Human Health

During the operational phase, there is the potential for a release of pollutants for example, from contaminated firewater, may result in harm to the receiving environment (including to land, soils, geology, water, biodiversity, air and the local population) by discharging into the Shannon Estuary or surrounding land.

As outlined in **Chapter 14** (Major Accidents and Disasters (MADS)) the engineering design of the Proposed Development will incorporate all of the appropriate standards and mitigation measures

necessary to reduce the risks of accidents and disasters to an acceptable level, *i.e.* as low as reasonably practicable (ALARP), which is the standard expected by the Regulatory Authorities.

Therefore, the consideration of embedded mitigation measures, and best practices has demonstrated that risk of a major pollution related accident on the receiving environment is **Low** during the operational phase.

18.9.2 Air Quality

There is a potential interaction with MADS and such an event would give rise to emissions of pollutants to air. The air quality assessment does not include an emergency scenario specifically, as the risk of such an event is considered very low, refer to **Chapter 14** (MADS).

In the unlikely event such an event does occur, there would likely be a **Short-Term** spike in nitrogen dioxide emissions and possibly PM₁₀ and PM_{2.5} emissions, that would increase the concentrations of these pollutants that the nearest receptors to the Site are exposed to. However, due to the distance between the nearest air quality sensitive receptors and the potential sources of emissions, such an increase is unlikely to cause an exceedance of an air quality standard or Environmental Assessment Level.

18.10 Climate

18.10.1 Water

During the operational phase there is a potential climate risks to the Proposed Development (climate change resilience), including increased frequency and severity of extreme weather events (such as heavy and / or prolonged precipitation). Increases in winter precipitation as well as sea level rise could also lead to surface water flooding and standing waters.

However, embedded design and mitigation measures for the Proposed Development will result in **No Residual** effects that were identified in relation to climate change resilience.

18.10.2 Biodiversity

Potential risks to biodiversity may be exacerbated by climate change during the construction and operational phases of the Proposed Development. An increase in the likelihood and severity of heat waves might have a **Negative** impact on biodiversity.

However, embedded design and mitigation measures for the Proposed Development resulted in **No Significant** residual effects in relation to biodiversity.

18.10.3 Landscape and Visual

Climate change may reduce the success of landscaping if unsuited vegetation is introduced. However, this is mitigated against by planting species more tolerant to changing climatic conditions. As such no residual interaction is identified in **Chapter 10** (Landscape and Visual).

18.10.4 Population and Human Health

Chapter 15 (Climate) outlines an assessment of the effects of the Proposed Development on climate change during its initial 25-year operational phase. The assessment states that operation of the Proposed Development will result in annual carbon emissions of approximately 21,742,544 tCO₂e.

The Proposed Development will support the achievement of energy security by providing an alternative electricity supply to the typically intermittent electricity supply from wind power, enabling the expansion of renewable energy generation capacity and the transition to a reliable and consistent low carbon energy network through comparatively fast response times and the integration of the battery energy storage system (BESS). Additionally, it is acknowledged that without a supply of gas-powered electricity generation, Ireland would not meet its 80% by 2030 renewable energy electricity target, in turn allowing Ireland to meet its national carbon reduction target. It is important to note that the emissions associated with the Power Plant could reduce over time based upon projected running hours. Finally, the ability of the Power Plant to operate at a 50% blend of hydrogen by design, offers the potential for the Power Plant to become even more efficient in emission terms over the period to 2050 as and when the required policies and supply chains for hydrogen are implemented.

The population and human health assessment identified that measures in the CEMP (**Appendix A2.3**, Volume 4) related to climate change resilience will be implemented accordingly. The potential health impact during operation due to the generation of GHGs leading to climate change is therefore assessed to be **Negative**.

18.10.5 Major Accidents and Disasters

Extreme weather conditions exacerbated by climate change could cause damage to the physical elements of the Proposed Development. However, embedded mitigation measures for the Proposed Development resulted in **No Significant** residual impacts were identified in relation to climate change resilience.

18.11 Waste Management

18.11.1 Land, Soils and Geology

Construction waste arisings including hazardous wastes have the potential to cause pollution if adequate storage and handling procedures are not followed. The mitigation measures detailed in **Chapter 16** (Waste Management) and the Resource Waste Management Plan (RWMP) (refer to **Appendix A16.1**, Volume 4) will reduce the significance of effect to **Not Significant**.

18.11.2 Water

The risk of potential significant impacts on the water environment during the construction phase (in the absence of adequate management and mitigation measures) which can arise from several activities including from uncontained spillage of wastewater effluent and / or runoff from chemical and waste storage or handling areas.

Mitigation measures for this risk are provided in **Chapter 06** (Water) such as storing diesel and chemical odorants in bunded facilities / tanks. As a result, the potential residual effects from the Proposed Development is considered to be **Imperceptible**.

18.11.3 Traffic and Transport

A potential interaction associated with air and noise impacts of vehicles collecting waste is identified and considered as part of the overall construction traffic. **No Significant** additional effect interaction has been determined.

18.11.4 Population and Human Health

The potential effects on human beings in relation to the generation of waste are that incorrect management of waste could result in littering which could cause a nuisance to the public and attract vermin. Mitigation measures are outlined in **Chapter 16** (Waste Management) and the RWMP (**Appendix A16.1**, Volume 4) in relation to measures for on-site management and temporary storage of waste. This will ensure appropriate management of waste and result in **No Significant Adverse** effects on the local population.

18.12 Summary

A summary of the identified interactions between topics is provided in **Table 18.1**.

Table 18.1: Summary of Environmental Interactions

Environmental Aspect / Interaction	Land, Soils & Geology		Water		Biodiversity		Air Quality		Noise & Vibration		Landscape & Visual		Traffic & Transport		Cultural Heritage		Population & Human Health		Major Accidents & Disasters		Climate		Waste Mgt.		Material Assets		
	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	
Land, Soils & Geology																											
Water	✓	x																									
Biodiversity	✓	✓	✓	✓																							
Air Quality	✓	x	x	x	✓	✓																					
Noise & Vibration	✓	x	x	x	✓	✓	x	x																			
Landscape & Visual	✓	x	x	x	✓	✓	x	x	x	x																	
Traffic & Transport	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓															
Cultural Heritage	✓	x	x	x	x	x	✓	x	✓	x	x	x	✓	x													
Population & Human Health	✓	x	x	x	x	✓	✓	✓	✓	x	✓	✓	✓	✓	x	x											
MA&Ds	x	✓	x	✓	x	✓	x	✓	x	x	x	x	x	x	x	x	x	✓									
Climate	✓	x	x	✓	x	✓	✓	✓	x	x	x	✓	✓	✓	x	x	x	✓	x	✓							
Waste Mgt.	✓	✓	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	✓	✓	x	x	x	x					
Material Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			

Con	Construction Phase	✓	Weak / Some / Strong Interaction
Op	Operational Phase	x	No Interaction

