

# CHAPTER 18

## Interactions

Shannon LNG Limited  
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**Shannon Technology and Energy Park**  
Environmental Impact Assessment Report

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## 18. Interactions

### 18.1 Introduction

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

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).'*

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, however, presents a summary of each assessment of the interaction (interrelationship) 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 and Soil;
- Water;
- Biodiversity;
- Air Quality;
- Noise and Vibration;
- Landscape and Visual;
- Traffic and Transport;
- Cultural Heritage;
- Population and Human Health;
- Major Accidents and Disasters;
- Climate;
- Waste; and
- 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 within respective chapters within this EIAR. No additional mitigation or monitoring measures are proposed in this chapter.

## 18.2 Competent Expert

This assessment has been undertaken by Adèle Wratten, Senior Environmental Consultant, MEnvSci, PIEMA, REnvP (AECOM). Adèle has five years' experience coordinating multi-disciplinary teams across all stages of the EIA process. She has experience of managing site appraisal and feasibility assessments, EIA screening, scoping and Environmental Impact Assessment reports, and the discharge of consents and permits across a range of sectors including energy, water, commercial and residential developments.

## 18.3 Land and Soils

Land and soil interactions are summarised under the following sections.

### 18.3.1 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 and Soils will minimise the potential for any adverse effects 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 – Land and Soils).

### 18.3.2 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 effects from land take on a number of species within the study area. For example, hedgehogs and woodland edge bird species will likely recolonise the Proposed Development site following the new landscape planting. In addition, replacement woodland planting may provide replacement habitat for bats. Residual impacts on habitats as a result of the land take will remain **negative, long term** and **slight-not significant**.

### 18.3.3 Air Quality

Various construction activities, including earthworks and movement of material on and offsite have the potential to create negative effects 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 effect is **not significant**. The final list of mitigation measures to be taken forward during the construction works will be defined within the Proposed Development's Outline Construction Environmental Management Plan (OCEMP) (Appendix A2-4, Vol. 4).

### 18.3.4 Noise and Vibration

Movement of excavated materials onsite can result in noise and vibration impacts to sensitive receptors surrounding the Proposed Development 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 OCEMP (Appendix A2-4, Vol. 4), no adverse impacts on sensitive receptors located close to the Proposed Development site are predicted.

### 18.3.5 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 the Co. 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.

### 18.3.6 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** effects 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.

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

### 18.3.7 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 and Soils, will likely reduce identified construction phase negative impacts.

### 18.3.8 Climate

Construction activities such as land clearance and land use change can affect 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 and soils could be impacted due to sea level rise and changes to storm patterns. This reduction in climate change resilience could negatively affect the development itself 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, none of the potential effects from GHG emissions on land use were identified to be of major or high significance.

## 18.4 Water

Water interactions are summarised under the following sections.

### 18.4.1 Land and Soils

The embedded mitigation measures outlined in Chapter 02 – Project Description, including the provision of an attenuation system with a Class 1 interceptor and effluent treatment in a packaged Waste Water Treatment Plant prior to discharge to marine surface water under 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. As such, likely significant effects on receiving land and soils environment are not anticipated.

## 18.4.2 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 and lubricants 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 gravels 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 effects will likely reduce and residual impacts are predicted to be **imperceptible** and **not significant**.

In addition to this, the bridge across the Ralappane Stream and drainage ditch will likely reduce the amount of feeding area available and may affect existing fish stocks, either directly via habitat loss or indirectly via effects 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.

Sediment deposition rates from the suspended sediment plume are predicted to be low due to the high flow velocities. As discussed in Chapter 07A – Marine Biodiversity, the cold water, suspended sediment and treated effluent will undergo extremely high levels of dilution and dispersion within a short distance (approximately 1 km) of the Proposed Development site. Also, the predicted current directions on the ebb tide indicate little or no interaction with the oyster production sites in inner Ballylongford Bay.

## 18.4.3 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 effects could include desiccation of archaeological features and artefacts by the removal of water. It is considered that adverse effects to soils are not anticipated during the construction and operational phases. As such, likely significant effects upon the adjacent areas of archaeological potential are not anticipated.

## 18.5 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 Industrial Emissions (IE) licence and incorporate ongoing monitoring through construction and operation.

### 18.5.1 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 adverse visual effects.

### 18.5.2 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.

## 18.6 Air Quality

Air quality interactions are summarised under the following sections.

### 18.6.1 Biodiversity

As outlined in Chapter 07B – Terrestrial Ecology, air quality effects 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 Candidate Special Area of Conservation (cSAC)/ River Shannon and River Fergus Estuaries Special Protection Area (SPA). However, the assessment has noted that the majority of the cSAC/ SPA within 50 m of the construction site boundary is tidal estuary and should dust deposit beyond the Proposed Development site boundary, it is likely to be washed away naturally. In addition to this, it was identified that no rare species or habitat which are sensitive to air quality effects are located in the vicinity of the Proposed Development. In the absence of mitigation, the effect on terrestrial, freshwater and estuarine habitat during construction will be **short-term** and **not significant**.

The assessment of operational phase emissions has identified that whilst the Proposed Development will have some impact on local air quality, the extent of that effect is **slight to moderate** at limited locations where the effect does not put at risk compliance with an Air Quality Standard or Environmental Assessment Level. The Proposed Development will be operated under the conditions of an IE licence and ongoing monitoring through construction and operation, which will ensure no further impact. Details of the proposed mitigation and monitoring measures are provided in Chapter 08 – Air Quality and the OCEMP (Appendix A2-4, Vol. 4). Therefore, no significant effects on ecological receptors from operational air emissions are predicted to occur.

### 18.6.2 Cultural Heritage

Dust generated from a number of construction activities may affect the setting of cultural heritage assets identified within close proximity to the Proposed Development 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 OCEMP (Appendix A2-4, Vol. 4), to ensure that archaeological areas and sites are protected during construction.

### 18.6.3 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. For example, there is a risk of potential odour emissions from fugitive sources during the operation of the Proposed Development. Provided that the appropriate air quality mitigation measures are followed, the potential health effect during construction due to dust and odours is assessed to be neutral.

### 18.6.4 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 **minor adverse**. The fuel consumption associated with the operating of the Power Plant would contribute the majority of the operational phase emissions. Operational emissions have been assessed as **major adverse**. However, the Proposed Development would contribute towards achieving energy security for the country by reducing reliance on the UK for gas supply, as well as providing an alternative electricity supply to the typically intermittent electricity supply from wind power. It is important to note that the emissions associated with the Power Plant could reduce over time based upon projected running hours.

## 18.7 Noise and Vibration

Noise and vibrations interactions are summarised under the following sections.

### 18.7.1 Biodiversity

The Terrestrial Ecology (Chapter 07B) assessment has identified a number of potential negative impacts on sensitive ecological areas from noise and vibration generated during both the construction and operation of the Proposed Development. For example, during the construction phase it is expected that there will be considerable disturbance of the Proposed Development site, particularly during underwater piling for the jetty and controlled rock blasting on land. The noise and vibration levels have been identified as potentially causing disturbance to bats, otters, foraging birds, badger and wintering birds. While this may create a disturbance to birds within the SPA, this will be a temporary and not significant impact on a small number of birds.

However, with the implementation of good construction management practice, as described in Section 9 of the OCEMP (Appendix A2-4, Vol. 4) and in Chapter 09 – Airborne Noise and Groundborne Vibration, the risk of adverse impacts from the noise and vibration during the construction phase will be minimised.

The assessment also identified that noise generated from the operations of 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, the noise assessment determined, during operation predicted noise levels from the Proposed Development in the absence of mitigation will be less than 55 dB, which are below the threshold likely to cause disturbance responses. The principal mitigation measures required for the Proposed Development in relation to noise concern selection of equipment, sound containment, and acoustic attenuators, in order to achieve the required limits. The predicted noise levels, as outlined in Chapter 09 – Airborne Noise and Groundborne Vibration are considered to be readily technically achievable using standard methods.

### 18.7.2 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 OCEMP, to ensure that archaeological areas and sites are protected during construction.

### 18.7.3 Population and Human Health

Construction activities can result in noise and vibration impacts to sensitive receptors surrounding the Proposed Development 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 OCEMP (Appendix A2-4, Vol. 4), no adverse impacts on sensitive receptors are predicted from onsite construction activities. A significant impact arising from noise generated by construction traffic on the existing road network is predicted on Link 2 (L1010 – Site entrance to Tarbert). However, this impact is limited to a relatively small number of properties and may be less significant than indicated due to the contextual factors discussed in Section 9.7.4 of Chapter 09.

## 18.8 Landscape and Visual

Landscape and visual interactions are summarised under the following sections.

### 18.8.1 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.

### 18.8.2 Population and Human Health

Visual effects will mainly relate to the introduction of large turbine halls and ancillary buildings including storage tanks, the LNG Terminal and LNG ships. 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 Section 18.5.1 and Chapter 11 – Landscape and Visual, it is considered that the proposed landscape planting and retention of existing vegetation to screen the site will mitigate the majority but not all of the likely adverse visual effects.

### 18.8.3 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. Lastly, landscaping will help mitigate the effects of combined Development-rated climate change impacts to biodiversity by creating habitats for flora and fauna.

## 18.9 Traffic and Transport

Traffic and Transport interactions are summarised under the following sections.

### 18.9.1 Land and Soils

Similar to the above, accidental spillage or leakage of oils and fuels from construction machinery or site vehicles may potentially result in the impact of soils and groundwater underlying the Proposed Development 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 and Soils it was determined that the likelihood and magnitude of the potential effects on land and soils occurring during the construction phase will significantly reduce. It was therefore determined that residual effects to soil and groundwater from accidental spillage and leaks will be **imperceptible** provided that appropriate mitigation/ control measures as specified is applied.

### 18.9.2 Water

There is risk of pollution due to accidental spillage and leaks from vehicles using the Proposed Development during its operation, 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.

### 18.9.3 Biodiversity

During construction, potential impacts on water quality include spillage of fuels, lubricants, hydraulic fluids and cement from construction plant, which may result in negative effects on fish and aquatic vertebrates. However, as outlined in Section 18.4.2, 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** and **not significant**.

### 18.9.4 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 Proposed Development site entrance), including residential dwellings adjacent to the L1010. With the implementation of appropriate mitigation measures, the residual effects significance from dust impacts was identified as **imperceptible** and **not significant**.

During the operational phase, there will be emissions to air from road traffic entering and existing the Proposed Development 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.

### 18.9.5 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 Proposed Development 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 adverse impacts** on sensitive receptors located close to the Proposed Development 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 between the Proposed Development site entrance and Tarbert.

### 18.9.6 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.

### 18.9.7 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 Proposed Development 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 OCEMP, 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.

### 18.9.8 Population and Human Health

It was identified in the Chapter 13 – Population and Human Health, that 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 and imperceptible effect** on severance between local residents in the study area and the facilities which they use during the construction period. 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.

## 18.9.9 Climate

Chapter 15 – Climate concluded that there will be GHG emissions resulting from both the construction and operational phase of the Proposed Development; for example, 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.

## 18.10 Major Accidents and Disasters

### 18.10.1 Land and Soils/ Water/ Biodiversity

A release of pollutants for example, from loss of containment of MFO, LNG and/ or contaminated firewater, may result in harm to the environment by discharging into the Shannon Estuary or surrounding land. However, the Major Accidents and Disasters (MADS) assessment (Chapter 14) identified that 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. 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.

### 18.10.2 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 (as confirmed in Chapter 14 – Major Accidents and Disasters). In the unlikely event such an event does occur, there would likely be a short-term spike in nitrogen dioxide emissions and possibly PM<sub>10</sub> and PM<sub>2.5</sub> 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.

## 18.11 Climate

### 18.11.1 Water

Potential climate risks to the Proposed Development (climate change resilience) during the operational phase include 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 mitigation measures for the Proposed Development resulted in **no residual impacts** that were identified in relation to climate change resilience.

### 18.11.2 Biodiversity

Potential development-related risks to biodiversity may be exacerbated by climate change during the construction and operational phases. For example an increase in the likelihood and severity of heat waves might have a negative impact on biodiversity. However, embedded mitigation measures for the Proposed Development resulted in **no significant** residual impacts in relation to combined impacts to biodiversity.

### 18.11.3 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.

### 18.11.4 Population and Human Health

Chapter 15 – Climate outlines an assessment of the effects of the Proposed Development on climate change during its initial 28-year operational phase. The assessment states that operation of the Proposed Development will result in annual carbon emissions of approximately 859,161 tCO<sub>2</sub>e. As a standalone development, this represents a major adverse impact, however the impact of this development needs to be considered in the context of the key role it will play in assisting Ireland to transition to a low carbon economy. All future energy scenarios show gas power plant being required in the period to 2050 and beyond. The Proposed Development will diversify the supply of natural gas and electricity to the Irish market. It does not in itself increase demand for natural gas or electricity. In a 'business as usual' scenario, where the Proposed Development is not progressed, this demand would be met by alternative, and potentially more carbon intensive power suppliers. The efficiency of the Power Plant combined with its ability to operate at a low minimum generation capacity means that the Power Plant will be dispatched ahead of a less efficient OCGT power plant as it will provide lower direct emissions and also provide system inertia (and other system services) at a lower output allowing for higher instantaneous renewable (non-synchronous) generation that would otherwise be the case if the Power Plant was not developed. 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 Proposed Development has a unique location and flexible design that can easily transition to alternative low carbon fuels, subject to future planning applications, once the technology and public policies are established.

The population and human health assessment identified that measures in the OCEMP (Appendix A2-4, Vol. 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**.

### 18.11.5 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 identified residual impacts** in relation to climate change resilience.

## 18.12 Waste

### 18.12.1 Land and Soils

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 (such as preparing a Site Waste Management Plan) will reduce the significance of effect to **not significant**. This will include potential effects from wastewater, as discussed in Section 18.12.2 below.

### 18.12.2 Water

The risk of potential significant impacts on the water environment during the construction phase (in the absence of adequate management and mitigation measures) can arise from several activities; for example, 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 impact of the Proposed Development is considered to be **imperceptible**.

### 18.12.3 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 additional effect** interaction has been determined.

### 18.12.4 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 is proposed in Chapter 16 – Waste in relation to measures for onsite management and temporary storage of waste. This will ensure appropriate management of waste and avoid any significant adverse effects on the local population.

## 18.13 Summary

A summary of the identified interactions between topics is provided in Table 18-1 below.

**Table 18-1 Summary of Environmental Interactions**

Environmental Aspect/ Interaction	Land & Soils		Water		Biodiversity		Air Quality		Noise & Vibration		Landscape & Visual		Traffic & Transport		Cultural Heritage		Population & Human Health		Major Accidents & Disasters		Climate		Waste		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
<b>Land &amp; Soils</b>																										
<b>Water</b>	✓	x																								
<b>Biodiversity</b>	✓	✓	✓	x																						
<b>Air Quality</b>	✓	x	x	x	✓	✓																				
<b>Noise &amp; Vibration</b>	✓	x	x	x	✓	✓	x	x																		
<b>Landscape &amp; Visual</b>	✓	x	x	x	x	✓	x	x	x	x																
<b>Traffic &amp; Transport</b>	x	x	✓	x	✓	✓	✓	✓	✓	✓	✓	✓														
<b>Cultural Heritage</b>	✓	x	x	x	x	x	✓	x	✓	x	x	x	✓	x												
<b>Population &amp; Human Health</b>	✓	x	x	x	x	✓	✓	x	✓	x	✓	✓	✓	✓	x	x										
<b>Major Accidents &amp; Disasters</b>	✓	x	x	✓	x	✓	x	✓	x	x	x	x	x	x	x	x	x	x								
<b>Climate</b>	✓	x	x	✓	x	✓	✓	✓	x	x	x	✓	✓	✓	x	x	x	✓	x	✓						
<b>Waste</b>	✓	✓	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	✓	✓	x	x	x	x				
<b>Material Assets</b>	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

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