

SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 01 Introduction

SSE Generation Ireland Limited

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Table of Contents

1.	Introduction	1-1
1.1	Background.....	1-1
1.2	Overview of the Proposed Development.....	1-3
1.3	Environmental Impact Assessment Report (EIAR).....	1-6
1.4	The Assessment Approach and Methods	1-9
1.5	Structure of this EIAR	1-14
1.6	References	1-20

Tables

Table 1.1: Description of Effects (Table 3.4 EPA, 2022)	1-10
Table 1.2: EIA Directive 2014/52/EU and EPA Guidelines (2022): Information for Inclusion in EIAR	1-15
Table 1.3: EIAR Review and Comment Locations	1-19

Appendices (EIAR Volume II)

Appendix 1A: EIAR Technical Team Details

Appendix 1B: Scoping Review Table

Figures (EIAR Volume III)

Figure 1.1: Location of the Proposed Development Site

1. Introduction

1.1 Background

This Environmental Impact Assessment Report (EIAR) has been prepared by AECOM Ireland Ltd. on behalf of SSE Generation Ireland Limited (SSE) (herein referred to as “the Applicant”). SSE are seeking planning permission for the proposed Open Cycle Gas Turbine (OCGT) power plant, administration building and workshop, and ancillary plant, site works and services (as described in more detail in EIAR Volume I Chapter 5) (herein referred to as the ‘Proposed Development’). The Site of the Proposed Development (herein referred to as ‘the Proposed Development Site’) is located within the existing SSE Tarbert Power Station site (‘SSE Tarbert’), in Tarbert, County Kerry (Co. Kerry).

The application boundary (‘red line boundary’) for the Proposed Development encloses an area of approximately 15.18 hectares (ha.) and encompasses land within the SSE Tarbert site (‘SSE Tarbert’), which is an area of 42ha, that is mostly under the management of the Applicant. The Proposed Development will connect to an existing electrical substation on the SSE Tarbert site.

This EIAR presents:

- A description of the Proposed Development.
- Details of the Proposed Development Site, location and layouts considered.
- The likely significant environmental effects of the construction, operation (including maintenance) and decommissioning of the Proposed Development; and
- Measures to avoid or reduce such effects.

This EIAR is provided in accordance with Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, as amended by EIA Directive 2014/52/EU (EIA Directive) and S.I. No. 296/2018 – European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (herein referred to as ‘EIA Regulations’), in order to inform the consideration of the Planning Application and provide the planning authority with the environmental information that must be taken into account when determining the application. The application area lies entirely within the administrative boundary of Kerry County Council (KCC) and notice of the application has been served to KCC accordingly, however the application will be submitted to An Bord Pleanála (ABP) for determination (see Section 1.3 for more details).

1.1.1 Overview of this Chapter

This chapter of the EIAR provides an overview of the Proposed Development, the Environmental Impact Assessment (EIA) methodology, structure of the EIAR, and is accompanied by Appendix 1A Scoping Review Table and Appendix 1B EIAR Technical Team, refer to EIAR Volume II.

This chapter is supported by Figure 1.1 (refer to EIAR Volume III) which illustrates the Proposed Development Site location.

For the purposes of the assessment, the following terms are used to describe the Proposed Development Site and its context:

- **‘The Proposed Development’** – also referred to as ‘Tarbert Next Generation Power Station’ relates to the 1 no. Open Cycle Gas Turbine (OCGT) plant, fuel storage and unloading facility, water storage tanks, surface water drainage system, electrical grid connection to substation and all associated ancillary development, site works and services, for which planning permission is being sought, which will be submitted to ABP for determination. Full details are included in EIAR Chapter 5.
- **‘The Proposed Development Site’** – also known as ‘the Site’, ‘the red line boundary’ or ‘planning application boundary’ relates to the area where the Proposed Development is located as delineated by the red line boundary. Refer to EIAR Volume III Figure 1.1.
- **‘Tarbert HFO Power Station’** – is the existing power station built in the 1960’s which runs on heavy fuel oil (HFO), which will cease operating in December 2023.
- **‘SSE Tarbert’** – relates to the wider Tarbert power station site which includes the Tarbert HFO Power Station (which will cease operating at the end of December 2023), the Temporary Emergency Generation (TEG) Power Plant (under construction), the National Oil Reserves Agency (NORA) mainland tank farm and the existing jetty facility; and
- **‘The TEG (Temporary Emergency Generation) Site’** – relates specifically to 3 no. OCGT plant installations with a combined output of 150MW under construction and which will be temporarily installed on an area of land within the SSE Tarbert site (Planning Ref. ABP-315838). This plant will commence decommissioning in 2028/2029.

The Proposed Development will be accessed via the existing SSE Tarbert site entrances (the main site entrance and the secondary/construction site entrance) off the N67 and would function independently of both the existing Tarbert HFO Power Station and the TEG Site. The Proposed Development will be capable of generating 350MW of electricity and would benefit from being located in an established and existing industrial power station site with existing connections to the wider electricity grid network. The Proposed Development includes a connection to the existing substation on the SSE Tarbert site. The electrical connection infrastructure required will be entirely ancillary to the Proposed Development, within the SSE Tarbert site will not constitute ‘transmission infrastructure’ under Section 182 of the Act.

1.1.2 The Applicant

The Applicant, is an SSE Thermal Generation Holdings Limited company, wholly owned by SSE plc. SSE plc’s purpose is to provide energy needed today while building a better world of energy for tomorrow. SSE plc is a leading generator of renewable electricity in the UK and Ireland and one of the largest electricity network companies in the UK. SSE plc develops, owns, and operates low carbon infrastructure to support the zero-carbon transition. This includes onshore and offshore wind, hydro power, electricity transmission and distribution grids, and efficient conventional generation, alongside providing energy products and services for businesses and homes. SSE plc plans to invest up to £40bn over the next decade, to deliver cleaner, secure, and more affordable energy. SSE plc is UK listed, is accredited under real Living Wage and Fair Tax Mark and in Ireland holds the Business Working

Responsibly mark. SSE plc entered the Irish market in 2008 through the acquisition of Airtricity and has expanded through organic growth and a number of acquisitions, now employing almost 1,000 people on the island of Ireland and a key participant in the all-island Single Electricity Market. SSE's activities in Ireland include:

- SSE Renewables owns 784MW of onshore wind capacity across 22 windfarms on the island, and operates a total of over 1,000MW. This includes Galway Wind Park, Ireland's largest and best performing onshore wind farm (co-owned with Greencoat Renewables). SSE Renewables is currently constructing additional onshore wind capacity in Ireland, and is actively developing solar and battery projects, as well as additional onshore and offshore wind projects.
- SSE Airtricity supplies electricity and gas to over 700,000 home and business customers across the island and delivers home energy upgrades through our one stop shop, the Generation Green Home Upgrade, which aims to deliver 50,000 home energy upgrades by the end of the decade.

SSE Thermal operates an industry-leading fleet of flexible generation and energy storage assets. SSE Thermal believes flexible and efficient thermal energy will play a critical role in the transition to a net zero future, complementing renewable generation and maintaining security of supply. In terms of thermal power generation assets, SSE Generation Ireland Ltd operates an industry leading fleet of flexible generation assets in Ireland:

1. 620MW Tarbert Power Station (oil) is situated on the Shannon Estuary in SSE Tarbert, Co. Kerry. The station comprises two 60MW and two 250MW oil-fired turbines. The existing units are required to cease generation by the end of 2023 in line with the station's Industrial Emissions Licence.
2. Great Island Power Station is a 464MW Combined Cycle Gas Turbine (CCGT) (gas), located on the shores of Waterford Harbour at Great Island, Co. Wexford. The gas-fired station entered commercial operation in 2015, replacing the former oil-fired station at the site. It is now one of the cleanest and most-efficient power stations on the island of Ireland, generating enough electricity to power half a million Irish homes.
3. Rhode Power Station is a 104MW OCGT plant (gas/oil) situated at Rhode, Co. Offaly. It commenced commercial operation in 2004.
4. Tawnaghmore Power Station is a 104MW OCGT (gas/oil) plant situated south of Killala in Co. Mayo. It commenced commercial operation in 2003.

SSE's vision is to become the leading provider of flexible thermal energy in a net-zero world, and therefore has an important role in accelerating the transition to net zero. The Applicant is looking at opportunities to decarbonise and enable the transition to net zero across the SSE thermal assets in Ireland.

1.2 Overview of the Proposed Development

The Proposed Development consists of a gas turbine operating in open cycle gas turbine (OCGT) mode fuelled by Hydrotreated Vegetable Oil (HVO) with an output of 350MW, fuel pipes, storage and

unloading area, water storage tanks, electrical grid connection and all associated ancillary development, site works and services (for information on sustainability of HVO please refer to EIAR Volume I, Chapter 17 Climate).

An OCGT plant has been selected for the Proposed Development as the equipment can respond to changes in the electricity demand by starting up quickly and achieving full output within a short period of time.

The Proposed Development will comprise of the following main components (refer to Chapter 5 EIAR Volume I for more details):

- OCGT generating plant and associated building.
- Emissions stack 55m in height (external diameter 9m) with continuous environmental monitoring systems (CEMS) platform.
- Selective Catalytic Reduction (SCR) and air dilution fans, filters and exhaust gas/ ammonia mixing skids.
- Fin fan coolers.
- Main and auxiliary transformer with a blast wall separating.
- Fire suppression enclosure/skid.
- Aqueous ammonia tank.
- Ignition propane gas tank and compound.
- Demineralisation water treatment plant.
- Demin water tanks (2 No. x 7,500m³ capacity).
- Raw water and fire storage water tank (5,900m³ capacity).
- Fire water module.
- HVO storage tanks 3 No. tanks in total with two unloading bays.
- Fuel polishing building.
- HVO pipework (approximately 200m).
- Electrical connections from main transformer (unit) to 220kV substation.
- New wastewater treatment plant.
- Administration building and workshop.
- Stores.
- Carparking.
- Flood defence works; and
- Demolition works (removal of existing buildings).

EIAR Chapter 3: Need and Alternatives (EIAR Volume I), provides details of the alternatives considered and how the Proposed Development layout was selected.

1.2.1 Site Area

The Proposed Development Site is situated north of Tarbert, Co. Kerry, Ireland (Irish Grid Reference X: 475237; Y: 5826671). The entire SSE Tarbert site is located within the administrative area of KCC.

The Proposed Development Site, which is brownfield land located west of the N67, a National Secondary Road in Tarbert, is within the SSE Tarbert site. The area available for the Proposed Development (the red line boundary) is 15.18ha.

A full description of the Proposed Development Site is detailed in Chapter 4: Existing Site and Conditions (EIAR Volume I).

1.2.2 Site History

The Tarbert HFO Power Station at SSE Tarbert was developed in the 1960's, it is a 626MWe HFO fired power plant, which had been operational since 1969. The SSE Tarbert site is located on the southern shore of the Shannon Estuary, on Tarbert Island, originally agricultural land, connected to the mainland via a causeway.

There are four generating units at the station, two with a capacity of 57MWe each and two with a capacity of 256MWe each. The Tarbert HFO Power Station was constructed in two stages, units one and two commissioned in 1969 (57MWe each) and units three and four commissioned in 1976 and 1977 (256MWe each). Units three and four were refurbished in 2003 and 2004 and are fuelled by HFO with both Gas Oil and propane used as a start-up fuel. Each of the units are independent and consist of a boiler, steam turbine and auxiliary plant.

There are a number of fuel storage tanks adjacent the existing Tarbert HFO Power Station. The 'Island Tank Farm' within the Proposed Development Site comprises four HFO tanks, each with the capacity of 25,000 tonnes. At present, only two of these tanks are in use while the other two are currently not used. The 'Mainland Tank Farm' located 350m to the west of the Proposed Development Site includes 4 no. tanks which are not related to the power generation that occurs at SSE Tarbert and are under the control of the National Oil Reserves Agency (NORA) providing a national reserve.

The existing Tarbert HFO Power Station employee numbers have decreased over time and there will be 14 staff employed on the SSE Tarbert site as of Q3 2023, providing 24 hours per day, 365 days per year presence to operate SSE facilities including Rhode and Tawnaghmore Power Stations.

A summary of historic planning applications on the SSE Tarbert site is provided in Table 4.1, of Chapter 4 EIAR Volume I.

The Proposed Development Site location is shown in Figure 1.1 and the Site Setting on Figure 4.1 (refer to EIAR Volume III). The following text includes details of the relevant features in relation to the Proposed Development Site:

- Within – Areas of hardstanding, outbuildings which vary between storage sheds and workshops for the existing Tarbert HFO Power Station, the existing Tarbert HFO Power

Station, staff car parking and visitor's car parking area, the northern and southern site entrances, part of the ESB 220kV electrical transmission substation, and the power station reservoir.

- North –Tarbert Lighthouse and the Shannon Estuary.
- East –the N67 National Secondary Road and the Shannon Estuary.
- South-east –the Tarbert – Killimer ferry terminal, the N67 National Secondary Road and residential receptors.
- South – the TEG site, a lagoon draining the Shannon Estuary and agricultural lands further south of the mainland.
- South-west – the TEG site and the National Oil Reserves Agency (NORA) tank farm; and
- West – the Shannon Estuary.

Access to the Proposed Development Site will be via the existing SSE Tarbert entry points off the N67 of which there are two.

1.3 Environmental Impact Assessment Report (EIAR)

This EIAR has been prepared in accordance with the EIA Directive and in accordance with the requirements of the EIA Regulations and relevant guidance documents as listed in Section 1.6, in order to inform the consideration of the planning application and provide the planning authority with the environmental information that must be taken into account when determining this planning application.

In Irish legislation, Section 172 of the Planning and Development Act (as amended) ('the Act') establishes the requirement for EIA.

The Act, states:

'An environmental impact assessment shall be carried out by the planning authority or the Board, as the case may be, in respect of an application for consent for proposed development where either—

(a) the proposed development would be of a class specified in—

(i) Part 1 of Schedule 5 of the Planning and Development Regulations 2001,

and either -

(I) such development would exceed any relevant quantity, area or other limit specified in that Part, or

(II) no quantity, area or other limit is specified in that Part in respect of the development concerned,

Or

(ii) Part 2 of Schedule 5 of the Planning and Development Regulations 2001

and either—

(I) such development would exceed any relevant quantity, area or other limit specified in that Part, or

(II) no quantity, area or other limit is specified in that Part in respect of the development concerned,

Or

(b) (i) the proposed development would be of a class specified in Part 2 of Schedule 5 of the Planning and Development Regulations 2001 but does not exceed the relevant quantity, area or other limit specified in that Part.

And

(ii) the planning authority or the Board, as the case may be, determines that the proposed development would be likely to have significant effects on the environment.'

The classes of development where an EIA is mandatory are set down in Planning and Development Regulations, 2001 – 2023 (the Regulations) made pursuant to Section 176 of the Act. In addition, Schedule 5 of the Regulations sets out thresholds for projects, and if that threshold is equalled or exceeded an EIA must be carried out. These are mandatory requirements. Finally, where a project is of a type listed in the regulations but does not equal or exceed the applicable threshold then the likelihood of the project having significant effects on the environment – as considered against a range of prescribed criteria, must be assessed.

The Proposed Development, comprises an industrial installation for the production of electricity with an output in excess of 300MW, is within the descriptions of development in the Planning and Development Regulations, 2001, Schedule 5 of the Regulations, regarding Development for the purposes of Part 10:

2.(a) A thermal power station or other combustion installation with a heat output of 300 megawatts or more.

An EIA for the Proposed Development is mandatory for any Strategic Infrastructure Development (SID). A Pre-Application SID consultation was held with ABP on 28 August 2023 and the general scope and format of the EIAR was presented.

It was presented to ABP that the Applicant would be submitting an EIAR with the Planning Application, as required for SID applications.

1.3.1 EIA Approach

EIA provides a system of sharing information about the environment which enables likely environmental effects to be foreseen and prevented during the design and consent stages of a development, and for residual effects to be taken into account by the relevant consenting authority. This helps to protect the environment and informs and improves decision-making. The EIAR presents an objective and concise record of the process and the determination of likely significant environmental effects.

The EIAR requirements for consultation are defined under Article 6 of the EIA Directive. Statutory Authorities referred to in Article 6 (1) will be consulted on the specific characteristics of the project, including its location, technical capacity, and its likely impacts on the environment.

Additionally, in accordance with the requirements of the Aarhus Convention, the public statutory authorities, and relevant stakeholders will be given the opportunity to participate in the decision-making process. This integration will allow for the sustainable implementation of the environmental management of a development.

In the preparation of this EIAR, the following approach to assessment has been applied:

- Review – compiling relevant background data and identifying issues and constraints.
- Baseline Surveys (November 2022 – September 2023) – site walkover visits, detailed specialist surveys and discussions with relevant statutory and other consultees, to determine the nature and status of the existing environment.
- Impact Assessment – assessing likely significant environmental effects of the Proposed Development during construction, operation (including maintenance) and decommissioning.
- Determine Mitigation measures to form part of the final design of the Proposed Development.
- Assessment of residual environmental effects and their significance; and
- Assessment of Indirect, Secondary and / or Cumulative Environmental Effects and Inter-relationships.

Detailed assessment has involved impact analysis according to accepted methodologies, consultations, and site visits leading to the evaluation of the significance and magnitude of any direct, indirect, secondary, cumulative, short, medium, and long-term, permanent, and temporary, positive and negative effects on the environment from the Proposed Development.

These assessments have enabled mitigation measures to be developed which will be implemented to avoid, reduce, or remediate likely significant environmental effects.

This EIAR describes the investigations, findings, and conclusions of the assessment, and any proposed monitoring of the environmental effects that will be undertaken during and after the construction of the Proposed Development.

An explanation of the approach to undertaking the assessment and producing the EIAR is detailed in Section 1.4. In summary, this EIAR has compiled, evaluated, and presented the likely significant environmental effects of the Proposed Development. The assessment is designed to help detecting likely significant effects, thus leading to the identification and incorporation of appropriate environmental mitigation measures into the development. The main steps in the assessment procedure can be summarised as follows:

- Examine the environmental character of the area likely to be affected by the Proposed Development through baseline studies.
- Predict the potential likely significant effects on the environment, both beneficial and adverse, of the Proposed Development.
- Introduction of design and operational modifications or other measures to avoid, reduce or offset adverse effects, and where possible, achieve beneficial effects; and

- Detail the findings of the assessment in the EIAR.

1.3.2 Project Scoping and Review

The purpose of the Scoping process is to determine which topics should be included in the EIAR, and the level of detail to which they should be assessed.

AECOM has undertaken a Scoping Review (see Appendix 1A EIAR Volume II). The Scoping Review has been prepared by the AECOM EIA technical teams to enable the scope of the assessment to be defined. A formal request for scoping under Section 37D of the Act was not made.

1.3.3 Pre-Application Engagement

The Pre-Application process included a meeting and presentation with ABP as the Planning Authority, and Kerry County Council (KCC) as the local authority. Further details in relation to the consultation process are provided within EIAR Volume I Chapter 6.

The National Parks and Wildlife Service (NPWS) were also engaged in relation to biodiversity, please refer to EIAR Volume I Chapter 9 Biodiversity for more details.

1.3.4 Consultations

Formal consultations have been undertaken prior to the submission of this EIAR, they have included formal and informal processes, more details of which are located within EIAR Volume I Chapter 6.

1.4 The Assessment Approach and Methods

The assessment of impacts has been conducted in accordance with EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (May 2022) with reference to the following general approach. The specific methodology adopted for each assessment is contained in the individual technical chapters. Likely significant effects arising from the Proposed Development have been identified and described and an assessment of the level of significance for each effect determined. Determination of the significance of the effects is a key stage in the assessment. The criteria for assessing sensitivity and magnitude level have been defined for each environmental topic in the appropriate section of the EIAR and may vary from the general approach set out in this section. The overall significance of an effect, taking the relationship between sensitivity and the magnitude level of impact into consideration, is also defined for each environmental subject.

1.4.1 Assessment Methodology

This EIAR has assessed the different phases of the Proposed Development including the construction phase, operational phase and decommissioning phase. Each phase has been assessed against the baseline, including the future baseline. The phases are as follows:

- Baseline – Based on current baseline which includes the TEG plant construction period which is ongoing.
- Construction phase scenario – The assessment of the Proposed Development construction phase, which is expected to have a duration of 29 months and consideration and assessment of any overlap with the operation phase of the TEG plant.

- Operational scenario – The assessment of the operational Proposed Development (350MW OCGT) against a future baseline scenario (i.e., the assessment will include the temporary overlap period with the existing operational TEG plant); and
- Decommissioning scenario – Assessment of the decommissioning of the Proposed Development at the end of its operational life. It is considered for assessment purposes that this will be the same as the construction phase (minus overlap with TEG plant).

1.4.2 Description of Effects

The term 'significance of effects' generally refers to the importance of the outcome of the effects which are the consequences of changes. Significance is determined by a combination of scientific (objective) and social (subjective) factors.

Table 1.1 outlines the approach to describing environmental impacts and effects in this EIAR. The methodology adopted closely follows that detailed in the EPA Guidelines (2022).

Table 1.1: Description of Effects (Table 3.4 EPA, 2022)

Quality of Effects It is important to inform the non-specialist reader whether an effect is positive, negative, or neutral.	Positive Effects A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error
	Negative/Adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem, or damaging health or property or by causing nuisance)
Describing the Significance of Effects 'Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see Determining Significance).	Imperceptible An effect capable of measurement but without significant consequences.
	Not significant An effect which causes noticeable² changes in the character of the environment but without significant consequences.
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects

	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very Significant An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound Effects An effect which obliterates sensitive characteristics
Describing the Extent and Context of Effects Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.	Extent Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
	Context Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions.
Describing the Probability of Effects Descriptions of effects should establish how likely it is that the predicted effects will occur.	Likely Effects The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects 'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.	Momentary Effects Effects lasting from seconds to minutes
	Brief Effects Effects lasting less than a day
	Temporary Effects Effects lasting less than a year.
	Short-term Effects Effects lasting one to seven years.
	Medium-term Effects Effects lasting seven to fifteen years.
	Long-term Effects Effects lasting fifteen to sixty years.
	Permanent Effects Effects lasting over sixty years

	Reversible Effects Effects that can be undone, for example through remediation or restoration
	Frequency of Effects Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
Describing the Types of Effects	Indirect Effects or Secondary Effects Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative Effects The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	‘Do-Nothing Effects’ The environment as it would be in the future should the subject project not be carried out.
	‘Worst case’ Effects The effects arising from a project in the case where mitigation measures substantially fail. It can also be a worst-case assumption where there is uncertainty in the assessment or in the effectiveness of mitigation measures.
	Indeterminable Effects When the full consequences of a change in the environment cannot be described.
	Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents, (e.g., combination of SO_x and NO_x to produce smog).

1.4.3 Determining Significance

Table 1.1. provides seven categories by which to determine the significance of an impact. Plate 1.1 is an illustration provided in the EPA Guidelines (2022) of how comparing 'the character of the predicted effect to the sensitivity of the receiving environment can determine the significance of the effect.

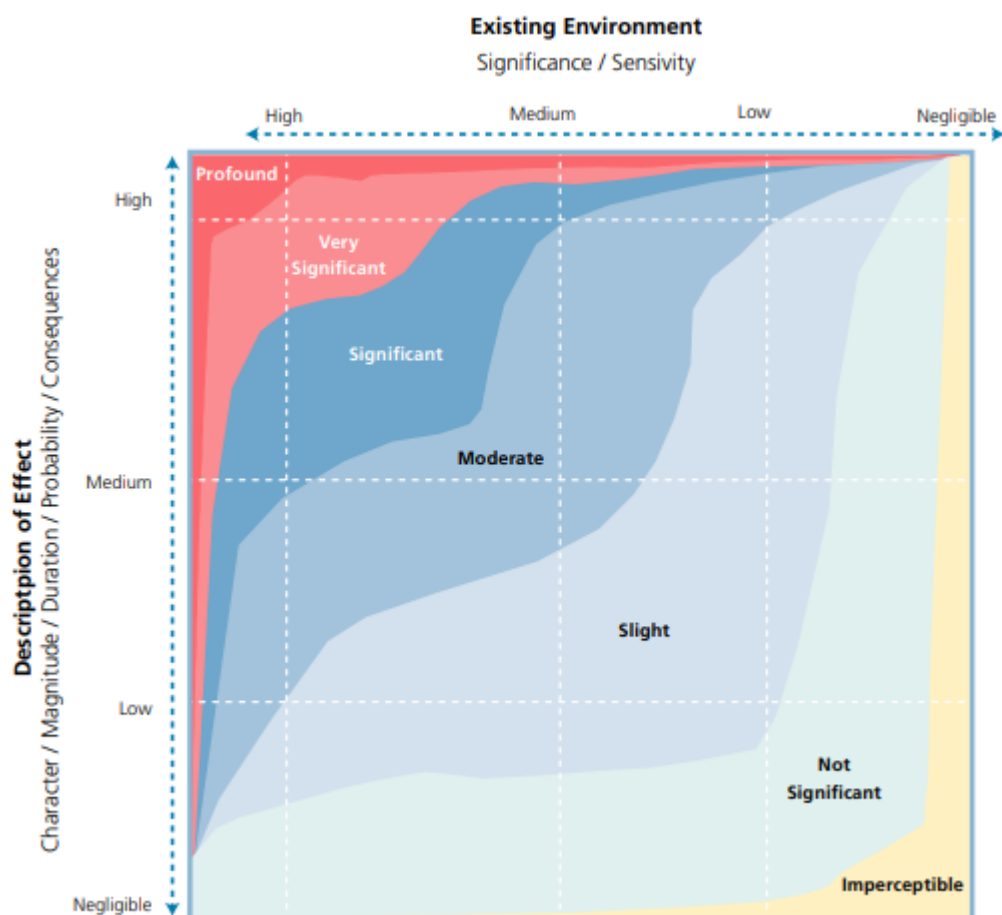


Plate 1.1: Chart showing typical classification of the Significance of Effects (Figure 3.4 of EPA EIAR Guidelines)

1.4.4 Cumulative Effects / Other Developments

In February 2022, a submission consisting of an Environmental Report (Planning Ref. ABP-315838-23) was submitted to ABP for an emergency generation development project in accordance with the Development (Emergency Electricity Generation) Act 2022 (the 2022 Act), and in line with the conditions in the Minister for the Environment, Climate and Communications' decision to approve the designated development (the TEG Plant), for a 150MW OCGT plant on a south-western portion of the SSE Tarbert site. Construction works for this project have commenced, and once complete in 2024 the project will be operational for approximately five years (until 2029). After this time, the project is expected to be decommissioned, dismantled and removed from SSE Tarbert in line with that project's requirements.

An application has been submitted by EirGrid (Planning Ref 23350) for works covering an area of approximately 6.9ha on lands within the SSE Tarbert site. These proposed works will consist of removal of existing cable and the addition of two new lengths of 220kv underground cabling approximately 340m

in length to connect into the existing ESB substation. The works, if consented, will be within a section of the Proposed Development Site.

In 2018 an application was submitted by SSE Renewables (Ireland Limited) for the construction of a battery storage facility within the SSE Tarbert site (Planning Ref. 18932), this application was granted a 10-year planning permission. The project will consist of 50 self-contained battery container units and associated colling units, step up transformers and a control building. The project is to be located on the lands which are currently being used for the TEG project, therefore the project may be constructed once the TEG plant has been decommissioned and dismantled in approximately 2028/2029.

1.4.4.1 Timescales

For the purposes of the assessment, it is expected that the construction period for the Proposed Development will be 29 months.

With regard to the operational phase, it is envisaged that the Proposed Development will have a design life of 25 years. For the purpose of the environmental assessment, the lifetime of the Proposed Development is estimated as 25 years post commissioning and this is based on the design life of the equipment proposed. The operational requirements of the Proposed Development will inevitably change during its design life, and it will be subject to regular reviews to identify potential modifications and amendments that would allow the asset to have a future sustainable use beyond 25 years. Any replacement of major components for modifications and amendments will be subject to the necessary planning restrictions at the time they are intended to be carried out.

At the end of the design life, the Proposed Development would either be decommissioned, or the lifetime could potentially be extended subject to compliance with the necessary planning requirements for amendment, modification and / or operation, as applicable.

1.4.4.2 Indication of Difficulties Encountered

There were no significant difficulties encountered during the preparation of this EIAR, however where difficulties were encountered for the specialist EIAR chapters, they have been identified and discussed in their relevant chapters.

1.5 Structure of this EIAR

The EIAR has been prepared to satisfy the requirements of Schedule 6 of the EIA Regulations – ‘Information to be contained in EIAR’.

The format of the EIAR reflects that proposed at the EIAR scoping stage and covers the assessment topics agreed through the EIA scoping process.

The EIAR must contain the information specified in Article 5(1) and (2) and Annex IV of the EIA Directive. It must also include any additional information specified in Schedule 6 of the Planning and Development Regulations 2001 (as amended) which is relevant to the specific characteristics of the development or type of development and to the environmental features likely to be significantly affected.

Table 1.2 signposts where the relevant information required to satisfy the Regulations is presented within this EIAR.

Table 1.2: EIA Directive 2014/52/EU and EPA Guidelines (2022): Information for Inclusion in EIAR

REFERENCE	EIAR CHAPTER WHERE REQUIRED INFORMATION IS PRESENTED
Directive 2014/52/EU Article 3	
<i>(1) 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:</i>	
<i>(1)(a) Population and human health</i>	EIAR Chapter 15: Population and Human Health
<i>(1)(b) Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC</i>	EIAR Chapter 9: Biodiversity
<i>(1)(c) Land, soil, water, air and climate</i>	EIAR Chapters: • 13: Land and Soils • 12: Water Environment • 7: Air Quality • 17: Climate
<i>(1)(d) Material assets, cultural heritage and the landscape</i>	EIAR Chapters: • 16: Material Assets • 8: Cultural Heritage • 10: Landscape and Visual
<i>(1)(e) The interaction between the factors referred to in points (a) to (d)</i>	EIAR Chapters 7 – 19, within the Cumulative Effects Section of each Chapter, and Chapter 20: Interactions
<i>(2) The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned.</i>	EIAR Chapter 19: Major Accidents and Disasters
Directive 2014/52/EU Article 5	
<i>(3) Where an environmental impact assessment is required, the developer shall prepare and submit an environmental impact assessment report. The information to be provided by the developer shall include at least:</i>	
<i>(3)(a) A description of the project comprising information on the site, design, size and other relevant features of the project</i>	EIAR Chapters 1 - 5
<i>(3)(b) A description of the likely significant effects of the project on the environment</i>	EIAR Chapters 7 - 19
<i>3(c) A description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment</i>	EIAR Chapter 5: Proposed Development and Chapters 7 – 19
<i>3(d) A description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment</i>	EIAR Chapter 3: Need and Alternatives
<i>3(e) A non-technical summary of the information referred to in points (a) to (d)</i>	NTS provided as a standalone document

REFERENCE	EIAR CHAPTER WHERE REQUIRED INFORMATION IS PRESENTED
3(f) Any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.	See following rows.
Directive 2014/52/EU Annex IV	
(1) A description of the project, including in particular:	
(1) (a) A description of the location of the project	EIAR Chapter 4: Existing Site and Conditions
(1) (b) A description of the physical characteristics of the whole project, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases	EIAR Chapter 5: Proposed Development
(1) (c) A description of the main characteristics of the operational phase of the project (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used	EIAR Chapter 5: Proposed Development
(1) (d) An estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases	EIAR Chapter 5: Proposed Development and Chapters 7 – 19
(5) A description of the likely significant effects of the project on the environment resulting from, inter alia:	
(5)(a) the construction and existence of the project, including, where relevant, demolition work	EIAR Chapters 7 – 19
(5)(b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;	EIAR Chapter 5: Proposed Development and Chapters: • 9: Biodiversity • 12: Water Environment • 13: Land and Soils
(5)(c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste	EIAR Chapters 7 – 19
(5)(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)	EIAR Chapters 7 – 19
(5)(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	EIAR Chapters 7 – 19 Chapter 20: Cumulative Effects
(5)(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change	EIAR Chapter 17: Climate
(5)(g) the technologies and the substances used	EIAR Chapter 5: Proposed Development

REFERENCE	EIAR CHAPTER WHERE REQUIRED INFORMATION IS PRESENTED
EPA Guidelines (2022) Section 3.5.5 (The Operation of the Project)	
<i>This is one of the most important sections of an EIAR. While accurate descriptions are vital to ensure credibility, not all of these topics will be relevant to many projects, particularly smaller scale ones:</i>	
<i>principal processes or activities, the scope of the project, the operations described in general terms, processes, regular activities, occasional activities, occupants, materials used</i>	EIAR Chapter 5: Proposed Development
<i>natural resources used (including energy and materials)</i>	EIAR Chapter 5: Proposed Development and Chapters: • 9: Biodiversity • 12: Water Environment • 13: Land and Soils
<i>residues and emissions</i>	EIAR Chapter 5: Proposed Development and Chapters: • 7: Air Quality • 11: Noise and Vibration • 12: Water Environment • 13: Land and Soils • 16: Material Assets • 18: Waste Management
<i>waste management</i>	EIAR Chapter 18: Waste Management
<i>secondary processes/activities</i>	EIAR Chapter 5: Proposed Development

This EIAR is presented as three volumes:

- Volume I – Environmental Impact Assessment Report (Main Text).
- Volume II – Appendices; and
- Volume III – Figures.

This specific document is Volume I which contains the EIAR main text. A Non-Technical Summary (NTS) is also provided as a standalone document.

This Chapter of the EIAR provides an introduction to the assessment process and approach, in addition to outlining the structure of the resultant EIAR. Chapter 1 establishes how the legal requirements are fulfilled as well as setting out the assessment approach, including a general methodology for the environmental assessment. EIAR Chapter 2 provides information about the Planning Policy in relation to the Proposed Development. EIAR Chapter 3 provides information about the need for and reasonable alternatives to the Proposed Development. EIAR Chapter 4 provides a description of the existing Site and conditions while EIAR Chapter 5 discusses the Proposed Development. EIAR Chapter 6 summarises consultations regarding the Proposed Development and the EIAR process.

EIAR Chapters 7 to 19 of this EIAR provide specialist assessments of impact to environmental topics. These comprise:

- Chapter 7 Air Quality.

- Chapter 8 Cultural Heritage.
- Chapter 9 Biodiversity.
- Chapter 10 Landscape and Visual.
- Chapter 11 Noise and Vibration.
- Chapter 12 Water Environment.
- Chapter 13 Land and Soils.
- Chapter 14 Traffic and Transport.
- Chapter 15 Population and Human Health.
- Chapter 16 Material Assets.
- Chapter 17 Climate.
- Chapter 18 Waste Management; and
- Chapter 19 Major Accidents and Disasters.

Interactions are considered in EIAR Chapter 20, and a Summary and Conclusions is presented in EIAR Chapter 21.

In addition to the information provided in each of the chapters, there is also supporting information within EIAR Volume II – Appendices which is cross referenced as required. Figures are provided in EIAR Volume III – Figures.

1.5.1 The Assessment Team

Details and a statement (a 'statement of competence') of the relevant expertise and qualifications of each of the contributors to the EIAR is required by EIA Regulations.

This assessment has been undertaken and the subsequent EIAR prepared by AECOM on behalf of the Applicant. In accordance with EIA Regulations, AECOM confirms that experts involved in the preparation of this EIAR are fully qualified and competent in their respective fields. Each expert has extensive proven expertise in the relevant field concerned, thus ensuring that the information provided herein is complete and of high quality.

Details of the assessment team (including a short biography for each team member) and relevant company, as well as their respective inputs to the EIAR is presented in Appendix 1B (refer to EIAR Volume II).

1.5.2 EIAR Review and Comment

The Environmental Impact Assessment Report (Volume I, II and III including the Non-Technical Summary) will be available for inspection or purchase on a payment of the specified fee (which fee shall not exceed the reasonable cost of making such a copy) during office hours, for a period of at least seven weeks (from receipt of application) at the offices of An Bord Pleanála and Kerry County Council:

Table 1.3: EIAR Review and Comment Locations

An Bord Pleanála

Kerry County Council

64 Marlborough Street	County Buildings
Rotunda	Rathass
Dublin 1	Tralee
DO1 V902	Co. Kerry
Ireland	V92 H7VT

The prescribed information set out in Article 97B of the EIA Regulations (as substituted by Article 65 of S.I. No. 296/2018 - European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018) has been uploaded to EIA Portal in advance of submission.

1.6 References

Transport Infrastructure Ireland (TII) (2022) Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Development PE-ENV-01106 (tiipublications.ie)

Institute of Air Quality Management (2016) Guidance on the assessment of dust from demolition and construction Version 1.1 dated 01/06/16.

Institute of Air Quality Management (2017) Land-Use Planning & Development Control: Planning for Air Quality v1.2

Environmental Protection Agency (2020). Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)

Environmental Protection Agency (EPA) (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.

European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 S.I. No. 296/2018 - European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (irishstatutebook.ie)

EU EIA Directive 2011/92/EU: Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (codification) (Text with EEA relevance) (legislation.gov.uk)

EIA Directive 2014/52/EU 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 (Text with EEA relevance) (legislation.gov.uk)

SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 02 Planning Policy

SSE Generation Ireland Limited

November 2023

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Table of Contents

2.	Planning Policy	2-1
2.1	Introduction	2-1
2.2	European Energy Policy	2-1
2.3	National Policy	2-3
2.4	Regional Planning Policy	2-10
2.5	Local Planning Policy	2-11
2.6	References	2-14

2. Planning Policy

2.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) provides an overview of EU, national, regional and local planning policy that is relevant to the Proposed Development. Before addressing the relevant planning policy, it provides, by way of context, an overview of relevant European and national energy policy, guidance and legislation. For a detailed consideration and assessment of the Proposed Development against applicable planning policy, please refer to the Planning Statement (PS, 2023) produced by Gravis Planning which accompanies the Planning application.

2.2 European Energy Policy

2.2.1 Energy Roadmap 2050

The Energy Roadmap 2050 was published by the European Commission in 2011 and explores the transition of Europe's energy systems so that they are compatible with the greenhouse gas (GHG) reduction targets set out in the Renewable Energy Directive (2009/28/EC) [Which has since been replaced by Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable resources (Referred to as 'recast' or 'REDII') – refer to Section 2.2.4 below – and, more recently, by 'REDIII', a series of further amendments to the Directive, adopted by the EU Council on 9th October 2023 but yet to be transposed into Irish law], while also increasing competitiveness and security of supply.

The Energy Roadmap 2050 has informed national energy policy in the years since its publication, including Ireland's Climate Action Plans, by providing a detailed analysis of the issues involved in transitioning to more sustainable, decarbonised energy systems and carrying out modelling of different approaches. This generated a series of policy options/ scenarios which assist political decision making by showing different decarbonisation pathways as well as their main economic, social, and environmental impacts.

2.2.2 European Parliament Resolution of 14 March 2013 on the Energy Roadmap 2050, a future with energy (2012/2103(INI)) (2016/C 036/11)

The European Parliament made the 'Resolution on the Energy Roadmap 2050' in March 2013, and it made a number of important points regarding the positive impact that the Energy Roadmap 2050 could have.

The main points of the Resolution as they relate to the Proposed Development include that:

- The Resolution endorses the Energy Roadmap 2050 as a basis for proposing legislative and other initiatives on energy policy, including milestones and targets on greenhouse gas emissions and renewable energy.
- It acknowledges that electricity from low carbon sources is indispensable for decarbonisation.

- The transition to a low-carbon and energy efficient economy is an opportunity not only for sustainability but also for security of supply.
- It stresses that for many renewable energy resources, it is impossible to guarantee a stable energy supply under current technological conditions, which requires that conventional energy sources need to be maintained on stand-by.
- It states that the Commission should support the move to third generation biofuels based on food crop waste products.
- It sets out the belief that all types of low-carbon technology will be needed to achieve the ambitious goal of decarbonising the EU's energy system in general and the electricity sector in particular.

2.2.3 2030 Climate and Energy Framework

The EU's '2030 Climate and Energy Framework'¹ sets a legally binding target for EU member states of achieving at least 32% of electricity generation from renewable sources by 2030.

The Framework includes EU-wide targets and policy objectives for the period from 2021 to 2030. Some of the key targets for 2030 under the Framework include:

- At least 40% cut in greenhouse gas emissions (from 1990 levels)²;
- At least 32% share for renewable energy; and
- At least 32.5% improvement in energy efficiency.

2.2.4 Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable resources ('recast')

Directive 2018/2001 entered into force in 2018 and has been legally binding since 2021. It sets an overall European renewable energy target and includes rules to ensure the uptake of renewables in the transport sector and in heating and cooling.

The Directive sets common principles and rules for renewable energy support schemes, sustainability criteria for biomass and the right to produce and consume renewable energy. The Directive (also referred to as 'RED II') provides specific sustainability criteria and detail on the carbon intensity of individual biofuels, including HVO. This includes assessment of the feedstocks used and the emissions from its production, processing, and supply.

The target for renewable energy in the EU has been increased with the adoption of Renewable Energy Directive III ('REDIII') in October 2023, with an overall EU renewable energy target of 42.5% in order to accelerate the phase-out of the Union's dependence on Russian fossil fuels by increasing the availability of affordable, secure and sustainable energy in the Union. Beyond that mandatory level, Member States should endeavour to collectively achieve an overall Union renewable energy target of 45 % in line with the REPowerEU Plan (details below).

¹ European commission Information Page: [2030 climate & energy framework \(europa.eu\)](https://european-council.europa.eu/media/1000000000/1/related_content/eu-climate-energy-framework-2030.pdf)

² As part of the European Green Deal the Commission has aims to increase this to at least 55% compared to 1990 levels, with legislative proposals for same adopted in 2021.

2.2.5 REPowerEU Plan (2022)

The EU Commission published the REPowerEU Plan in May 2022 to introduce measures that would rapidly reduce the EU's dependence on Russian fossil fuels well before 2030 by accelerating the clean energy transition.

The REPowerEU Plan is based on three pillars:

- Saving energy.
- Producing clean energy; and
- Diversifying the EU's energy supplies

The Commission has proposed to increase the target for renewable energy sources in the Directive to 45% by 2030. In March 2023, the European Council and Parliament provisionally agreed to raise the binding renewable energy target to at least 42.5% by 2030. This means almost doubling the existing share of renewable energy in the EU.

The Proposed Development complies with European Policy objectives. It will contribute to greenhouse gas reduction targets, facilitate the integration of more renewable generation into the electricity network, and help to maintain security of supply while supporting Ireland in its transition to a low carbon economy.

2.3 National Policy

2.3.1 Climate Action and Low Carbon Development (Amendment) Act 2021

The *Climate Action and Low Carbon Development Act 2015* (GOI, 2015) (the 2015 Act) established the national goal to move to a low carbon, climate resilient and environmentally sustainable economy. The National Mitigation Plan and the National Adaptation Framework were first established under the 2015 Act. A more ambitious target has now been committed to in law through the *Climate Action and Low Carbon Development (Amendment) Act 2021* (the 2021 Act). The 2021 Act amends the 2015 Act in order to strengthen the governance framework on climate action by the State through the introduction of a legally binding interim target of 51% reduction in greenhouse gas emissions by 2030 relative to a baseline of 2018. The 2021 Act establishes a target to achieve a carbon neutral economy by no later than the end of the year 2050 and introduces a system of successive five-year carbon budgets starting in 2021.

2.3.2 Climate Action Plan 2023

The Climate Action Plan 2023 (CAP23) was published in December 2022. CAP 2023 sets out a 'roadmap' to achieve a carbon neutral energy system by 2050. It commits Ireland to aim for up to 80% of its electricity supply to be generated from renewables by 2030, with no generation from peat or coal.

To achieve Ireland's targets under the Plan, a detailed sectoral roadmap setting out a range of measures and actions for each sector of the economy is included. For the electricity sector, the need for additional flexible dispatchable generation capacity is clear. CAP23 states that '*rapid delivery of flexible gas*

generation is needed at scale and in a timeframe to replace emissions from coal and oil generation before the second budget period' (i.e., 2026-2030)³.

Key measures identified for the energy sector under CAP23 include the need to “*deliver and accelerate a flexible system to support renewables*” and, in particular, that “*The CRU and EirGrid will ensure an adequate level of conventional dispatchable generation capacity*”⁴.

2.3.3 White Paper - Ireland's Transition to a Low Carbon Energy Future 2015-2030

The Government's Energy White Paper entitled ‘*Ireland's Transition to a Low Carbon Energy Future 2015-2030*’, set out the framework to guide Ireland's energy policy development over the period 2015-2030. The framework takes account of European and International climate change objectives.

The ‘*Energy Vision 2050*’ established in the White Paper describes a ‘radical transformation’ of Ireland's energy system, which is hoped will result in GHG emissions from the energy sector reducing by between 80% and 95%, compared to 1990 levels. This means that energy supply during the national transition to a renewable energy system will need to move away from carbon-intensive fuels such as peat and coal in favour of lower carbon fuels.

The White Paper notes that:

“No single renewable energy technology - existing or emerging - will alone enable Ireland to overcome the low carbon challenge. Rather, a diverse range of technologies will be required along the supply chains for electricity, heat and transport”⁵.

“Onshore wind continues to be the main contributor (18.2% of total generation and 81% of RES-E in 2014). It is a proven technology and Ireland's abundant wind resource means that a wind generator in Ireland generates more electricity than similar installations in other countries. This results in a lower cost of support”⁶.

“Several forms of RES-E, such as wind, solar and ocean energy are reliant on weather conditions and have an inherent variability. They cannot be dispatched in the same way as traditional generators, and this presents challenges for the electricity system”⁷ (emphasis added).

“Due to the variability of wind conditions, wind generation poses challenges to the operation of electricity grids. In Ireland, these challenges are being addressed by the electricity system operators under their DS3 programme”⁸.

The DS3 programme's stated aim is to “*meet the challenges of operating the electricity system in a secure manner while achieving the 2020 renewable electricity targets*”⁹. The Proposed Development

³ CAP23, Page 132

⁴ CAP23, Page 139

⁵ Department of Communications, Climate Action and Environment (DECC). (2015). *The White Paper: Ireland's Transition to a Low Carbon Energy Future 2015-2030*. (Para 103, Page 48)

⁶ Department of Communications, Climate Action and Environment (DECC). (2015). *The White Paper: Ireland's Transition to a Low Carbon Energy Future 2015-2030*. (Para 128, Page 53)

⁷ Department of Communications, Climate Action and Environment (DECC). (2015). *The White Paper: Ireland's Transition to a Low Carbon Energy Future 2015-2030*. (Page 54)

⁸ Department of Communications, Climate Action and Environment (DECC). (2015). *The White Paper: Ireland's Transition to a Low Carbon Energy Future 2015-2030*. (Para 128, Page 53)

⁹ <http://www.eirgridgroup.com/site-files/library/EirGrid/DS3-Programme-Brochure.pdf> (Page 2)

will provide quick response capabilities to EirGrid in keeping with the DS3 Programme ('Delivering a Secure, Sustainable Electricity System'). It will help to ensure that the grid network can continue to operate efficiently with the integration of variable renewable energy sources.

2.3.4 National Planning Framework 2018-2040 - Project Ireland 2040

'Project Ireland 2040 – National Planning Framework (NPF)' is a 20-year planning framework designed to guide public and private investment, to create and promote opportunities for Irish citizens, and to protect and enhance Ireland's built and natural environment.

The NPF notes that the population of Ireland is projected to increase by approximately 1 million people by 2040, which results in a population of roughly 5.7 million. This growth will place increased demands on both the built and natural environment as well as the social and economic fabric of the country, not least in terms of energy supply. In order to strengthen and facilitate more environmentally focused planning at the local level, the NPF states that future planning and development will need to:

*"Tackle Ireland's higher than average carbon-intensity per capita and enable a national transition to a competitive low carbon, climate resilient and environmentally sustainable economy by 2050, through harnessing our country's prodigious renewable energy potential"*¹⁰.

The NPF notes that Ireland's National Energy Policy is focused on three pillars:

- Sustainability.
- Security of Supply; and
- Competitiveness.

In line with these pillars, the NPF requires a secure and reliable electricity supply to be achieved, which is necessary for the realisation of almost all of its National Strategic Outcomes. National Strategic Outcome 8 (Transition to Sustainable Energy) notes that, in creating Ireland's future energy landscape, new energy systems and transmission grids will be necessary to enable more distributed energy generation which connects established and emerging energy sources to the major sources of demand. To facilitate this, the NPF acknowledges the need to:

*"Reinforce the distribution and transmission network to facilitate planned growth and distribution of a more renewables focused source of energy across the major demand centres."*¹¹

Some other key National Policy Objectives aimed at achieving the transition to sustainable energy include:

- **National Policy Objective 52:** *The planning system will be responsive to our national environmental challenges and ensure that development occurs within environmental limits, having regard to the requirements of all relevant environmental legislation and the sustainable management of our natural capital.*

¹⁰ Project Ireland 2040 – National Planning Framework, DHPLG, February 2018

¹¹ Government of Ireland, (2018). National Planning Framework. Project Ireland 2040 (Page 147).

- **National Policy Objective 54:** *Reduce our carbon footprint by integrating climate action into the planning system in support of national targets for climate policy mitigation and adaptation objectives, as well as targets for greenhouse gas emission reduction; and*
- **National Policy Objective 55:** *Promote renewable energy use and generation at appropriate locations within the built and natural environment to meet national objectives towards achieving a low carbon economy by 2050.*

The Proposed Development complements the national policy objectives around the creation of a lower carbon and more distributed energy generation system.

2.3.5 National Development Plan 2021 - 2030

The *National Development Plan 2021-2023* (NDP) was introduced alongside the NPF and sets out the investment priorities that will underpin its implementation. It provides additional context for the assessment of projects such as the Proposed Development. The NDP emphasises the need for investment in renewable energy sources, ongoing capacity renewal, and future technology that affords Ireland the opportunity to comprehensively decarbonise our energy generation.

The NDP was updated in October 2021 – ‘The National Development Plan 2021-2030’. The updated NDP’s focus for investment in the energy network is to:

- *‘Ensure that it meets the challenge of integrating world-leading levels of renewable wind and solar electricity whilst ensuring security of supply; and*
- *ensure that it is fit for purpose in the medium- to longer-term in order to meet projected demand levels’¹².*

It emphasises that ‘*ensuring continued security of energy supply is considered a priority at national level and within the overarching EU policy framework*’¹³.

The NDP recognises that the target of delivering up to 80% of Ireland’s electricity from renewable sources by 2030 will require investment in renewable electricity generation and storage **as well as** conventional electricity generation capacity to support the operation of variable renewable technologies and provide security of supply.

Strategic Investment Priority no. 4 aims to ‘*deliver circa 2GW of new conventional (mainly gas-fired) electricity generation capacity to support the operation of a predominantly wind/solar electricity system and provide security of supply for when variable electricity generation (wind/solar) is not sufficient to meet demand*’¹⁴.

The NDP clarifies that much of the 2GW of new conventional generation capacity needed over the next 10 years will need to be delivered within the next five years to meet demand.

2.3.6 Policy Statement on Security of Electricity Supply (2021)

The *Government’s Policy Statement on Security of Electricity Supply, (November 2021)* sets out a number of updates to national energy policy in the context of the Programme for Government

¹² Department of Public Expenditure and Reform, (2021). *National Development Plan 2021-2030* (Page 126)

¹³ Department of Public Expenditure and Reform, (2021). *National Development Plan 2021-2030* (Page 125)

¹⁴ Department of Public Expenditure and Reform, (2021). *National Development Plan 2021-2030* (Page 125)

commitments relevant to the electricity sector, planning authorities and developers. It seeks to ensure that continued security of electricity supply is considered a priority at national level.

The policy statement includes explicit Government approval that:

The development of new conventional generation (including gas-fired and gas oil/ distillate-fired generation) is a national priority and should be permitted and supported in order to ensure security of electricity supply and support the growth of renewable electricity generation.

2.3.7 National Energy Security Framework (2022)

The National Energy Security Framework, published by the Government in April 2022, provides a further policy response to the challenges of ensuring long-term and ongoing security of energy supply. It sets out a ‘whole of Government’ response to the challenges posed to the state’s energy security and energy affordability in the context of recent events including the war in Ukraine.

It recognises that the level of dispatchable electricity generation capacity needs to increase significantly over the coming years in order to reliably meet the expected demand for electricity, and notes that the CRU is managing a programme of actions to meet this challenge under its DS3 Programme. The CRU’s latest update of its Electricity Security of Supply programme of work¹⁵ notes continued challenges in the delivery of new generation capacity, leading to the retention of a number of existing older generation units until the delivery of new, lower carbon generation units to replace them.

2.3.8 EirGrid/SONI – Shaping our Electricity Future – A Roadmap to Achieve Renewable Ambition.

EirGrid’s ‘Shaping our Electricity Future’ document, first published in November 2021 (and updated in 2023), *“identifies the transmission network reinforcements needed to manage renewable generation and demand growth”*. It provides an outline of the key developments needed to support a secure transition to at least 80% renewables on the electricity grid by 2030. Inherent to this is continuing to operate, develop and maintain a safe, secure, reliable, economical, and efficient electricity transmission system with a view to ensuring that all reasonable demands for electricity are met. The document is informed by extensive stakeholder and public engagement alongside comprehensive modelling and analysis of network reinforcements. It advises that *the development of new...clean dispatchable capacity...is critical in mitigating the risks related to potential supply shortfalls*¹⁶.

2.3.9 The EirGrid/SONI Ireland Capacity Outlook 2022-2031

The latest all-Ireland Capacity Statement emphasises that the *“current outlook, based on the best information available, is serious. It is likely that in the coming years we will experience system alerts and will need to work proactively to mitigate the risk of more serious impacts”*¹⁷.

It predicts capacity deficits during the 10 years to 2031 and states that *“further new electricity generation will be required to secure the transition to high levels of renewable electricity over the coming decades”*. It is clear that this must include new clean dispatchable generation capacity such as gas or HVO-fuelled

15 CRU Information Note, Electricity Security of Supply Programme of Work Update October 2023, [Security of Electricity Supply – Programme of Actions | CRU.ie](https://www.cru.ie/en/reports-and-publications/programmes-of-work/2023/01/01/electricity-security-of-supply-programme-of-work-update-october-2023/)

¹⁶ Eirgrid/SONI (2023), Shaping our Electricity Future Roadmap version 1.1 (Page 66)

¹⁷ Eirgrid/SONI (2022), Ireland Capacity Outlook 2022 – 2031 (Page 4)

turbines: *“A balanced portfolio of new capacity is required, and this includes the need for new cleaner gas fired generation plant”*¹⁸.

It recognises that this balanced portfolio of new capacity is essential in order for Ireland to achieve its carbon budgets for the electricity sector up to 2030: *‘This balanced portfolio is also crucial to ensuring that Ireland meets its carbon budgets between now and 2030 for the electricity sector, which positions the electricity sector to achieve the zero net carbon target by 2050’*¹⁹.

2.3.10 EirGrid Group – Strategy 2020-50: Transform the Power System for Future Generations

EirGrid Group’s statement of purpose is to ‘Transform the power system for future generations’. The ‘Strategy 2020-50’ document sets out EirGrid’s strategy for achieving this and the challenges that they are facing. *“The electricity system will carry more power than ever before and most of that power will be from renewable sources”*²⁰. The necessary changes will be significant and will need to be managed in a co-ordinated and cost-effective way.

Strategy 2020 - 50 recognises that, in order to increase the amount of renewable power on the grid, the system must be operated in a more dynamic and responsive way. *“This will require improvements by the infrastructure to make the grid stronger and more flexible”*²¹. This will be achieved *“by using innovative solutions as well as proven technologies”*, but EirGrid will seek to ensure that the changes will not impact the reliability of the electricity system.

2.3.11 EirGrid Group – Delivering a Secure Sustainable Electricity System (‘DS3 Programme’)

In response to binding national and European targets, the EirGrid Group began a multi-year programme, “Delivering a Secure, Sustainable Electricity System” (DS3), in 2011. The aim of the DS3 Programme was to meet Ireland’s 2020 electricity targets by increasing the amount of renewable energy on the Irish power system in a safe and secure manner.

The DS3 Programme is designed to ensure that Ireland can securely operate the power system with increasing amounts of variable non-synchronous renewable generation over the coming years. The DS3 Programme remains ongoing, with new targets set for 2030, but is to be replaced by the operational roadmap set out in the ‘Shaping Our Electricity Future’ programme.

2.3.12 National Hydrogen Strategy

The National Hydrogen Strategy was published by the Department of the Environment, Climate and Communications in July 2023 and sets out a strategic vision for the role that hydrogen will play in Ireland’s energy system in the future, looking to its long-term role as a key component of a zero-carbon economy, and short-term actions that need to be delivered over the coming years to enable the development of the Sector.

The three key policy drivers of the Strategy are as follows:

¹⁸ Eirgrid/SONI (2022), Ireland Capacity Outlook 2022 – 2031 (Page 5)

¹⁹ Eirgrid/SONI (2022), Ireland Capacity Outlook 2022 – 2031 (Page 5)

²⁰ Eirgrid Group -Strategy 2020-50: Transform the Power System for Future Generations (Page 4)

²¹ Eirgrid Group -Strategy 2020-50: Transform the Power System for Future Generations (Page 10)

- Decarbonising our economy: providing a solution for hard to decarbonise sectors where electrification is not feasible, or cost-effective.
- Enhancing our energy security, through the development of an indigenous zero carbon renewable fuel which can act as an alternative to the 77% of our energy system which today relies on fossil fuel imports; and
- Developing industrial opportunities, through the potential development of export markets for renewable hydrogen and other areas such as Sustainable Aviation Fuels.

It identifies flexible power generation as one of the first sectors that will develop as a significant end-user of renewable hydrogen but recognises that the transition to hydrogen will take time and it will not be until mid to late 2030s that a national hydrogen network emerges.

2.3.13 Tomorrow's Energy Scenarios 2023 Consultation Report

The 'Tomorrow's Energy Scenarios 2023 Consultation Report' was published by EirGrid and SONI in November 2023. It sets out long term energy scenarios for Ireland and Northern Ireland and considers how electricity demand and generation may evolve from 2035 to 2050.

The four distinct scenarios that are being consulted upon are:

- 'Self-Sustaining': Follows a fast-paced transition away from fossil fuels to electrification of all sectors, culminating in a new power system from 2040.
- 'Offshore Opportunity': Follows a fast-paced transition to a decarbonised power system through faster and larger development of offshore wind and results in the power system becoming a significant net electricity exporter. This scenario also leads to a net zero power system by 2040.
- 'Gas Evolution': Follows a steadier pace, reaching a net zero power system by 2045 through the creation of significant renewable generation capacity to produce both electricity and power electrolysis plant to produce green hydrogen.
- 'Constrained Growth': This is the slowest of the four scenarios with a net zero power system being achieved by 2050. This involves slower development of decarbonised generation capacity and greater reliance on electricity imports when domestic supply is unable to meet demand.

The key conclusions arising out of the scenario testing include that electricity demand on the island of Ireland will more than double by 2050 and that, in all scenarios, a balanced portfolio of electricity generation will be required, with renewables supported by firm dispatchable capacity, with the acceleration of green fuels being required to offer reliability and flexibility to the power system.

2.3.14 Energy Security in Ireland to 2030 – Energy Security Package

The 'Energy Security in Ireland to 2030 – Energy Security Package' was published by the Department of the Environment, Climate and Communications in November 2023. The Energy Security Package sets out a range of measures to be implemented up to 2030 and subsequently reviewed every five years thereafter, reporting to a new Energy Security Group with responsibility for oversight.

The Energy Security Package sets out a series of actions for the short- and medium-term, prioritising:

- Reduced and Responsive Demand.
- Renewables Led System.
- More Resilient Systems.
- Robust Risk Governance.

Among the key Actions within the Package to create a more resilient energy system are Actions 8 and 12. Action 8, 'To complete implementation of the Commission for Regulation of Utilities (CRU) Security of Electricity Supply Programme', re-iterates the need for the *"procurement of at least 2GW of new, flexible, enduring, capacity through market mechanisms"*, while Action 12, 'To accelerate delivery of power system flexibility', notes that *"embedding flexibility in the power system can change how Ireland utilises conventional capacity and contribute to a secure transition"*.

The Proposed Development complies with National Policy objectives and long-term sectoral strategy. It will contribute to greenhouse gas reduction targets, facilitate the integration of more renewable generation into the electricity network, and help to maintain security of supply while supporting Ireland in its transition to a low carbon economy.

2.4 Regional Planning Policy

2.4.1 Southern Regional Assembly - Regional Spatial and Economic Strategy (RSES) 2020 - 2032

The Regional Spatial and Economic Strategy (RSES) for the Southern region was adopted in 2020 and provides a high-level development framework for the region that supports the implementation of the NPF. It identifies 11 principles to build a strong, resilient, sustainable region. With regard to climate change, the Strategy notes that a key priority is 'safeguarding and enhancing our environment through sustainable development, prioritising action on climate change across the Region, driving the transition to a low carbon and climate resilient society'²².

The following 'Regional Policy Objectives' aim to ensure that the development of the electricity network is undertaken in a safe and secure way which meets projected demand levels, Government Policy, and the need to achieve a long-term, sustainable and competitive energy future for Ireland:

- **RPO 87** – The RSES is committed to the implementation of the Government's policy under Ireland's Transition to a Low Carbon Energy Future 2015-30 and Climate Action Plan. It is an objective to promote change across business, public and residential sectors to achieve reduced GHG emissions in accordance with current and future national targets, improve energy efficiency and increase the use of renewable energy across the key sectors of electricity supply, heating, transport, and agriculture.
- **RPO 97** – It is an objective to support the sustainable technology upgrading and conversion of power stations in the Region to increase capacity for use of energy efficient and renewable energy sources.

²² Southern Regional Assembly (2020). Regional Spatial & Economic Strategy for the Southern Region

- **RPO 109** – Proposals for Bio-energy development and infrastructure will need to be subject to robust site and/or route selection that includes consideration of likely significant effects on European Sites and subject to the outcome of the required appraisal planning and environmental assessment processes.
- **RPO 219** – It is an objective to support the sustainable reinforcement and provision of new energy infrastructure providers (subject to appropriate environmental assessment and the planning process) to ensure the energy needs of future population and economic expansion within designated growth areas and across the Region can be delivered in a sustainable and timely manner and that capacity is available at local and regional scale to meet future needs.

The Proposed Development complies with Regional Policy objectives. It will greatly increase the capacity for the use of sustainable fuel in the generation of electricity and contribute to the sustainable upgrading of the historic Tarbert power station site. In doing so it will help to provide security of energy supply and the integration of more renewable generation into the electricity network while supporting Ireland in its transition to a low carbon economy.

2.5 Local Planning Policy

This section describes the local development plan policies of relevance to the Proposed Development. Part II of the Planning and Development Act (2000) (hereafter referred to as 'The Act') requires that, in making any determination under The Act, regard needs to be given to the local development plan.

The local development plan policy for the Proposed Development is contained within the Kerry County Development Plan (CDP) 2022-2028.

2.5.1 Kerry County Development Plan 2022-2028

The Kerry CDP notes that the availability of energy is of critical importance to the continued development and expansion of employment in the county and that it is vital that there is sufficient capacity to meet the current and future needs. Chapter 12 of the CPD outlines that '*Kerry is well placed to encourage and facilitate the sustainable development of power generation facilities in the county*' and '*will continue to support the infrastructural renewal*' and sustainable development of electricity and gas networks'.

The CDP states that it is the policy objective of KCC to '*ensure that the energy needs of future population and economic expansion within designated growth areas and across the county can be delivered in a sustainable and timely manner and that capacity is available at local and regional scale to meet future needs*'. Policy Objectives have been provided within the CDP to support this priority objective:

- **Policy 12-1 – Energy** - *Support and facilitate the sustainable provision of a reliable energy supply in the County, with emphasis on increasing energy supplies derived from renewable resources whilst seeking to protect and maintain biodiversity, archaeological and built heritage,*

the landscape and residential amenity and integration of spatial planning and energy planning in the county.

- **Policy 12-7 – Transmission Grid** - *‘Support and facilitate the sustainable development of enhanced electricity and gas supplies, additional electricity generation capacity, and associated networks, to serve the existing and future needs of the County’.*
- **Policy 12-16 – Renewable Energy** - *‘Facilitate and promote sustainable alternative forms of renewable energy including hydro, bio, solar, geothermal and off-shore wind energy.’ To support and liaise with statutory and other energy providers in relation to power generation, in order to ensure adequate power capacity for the existing and future needs of the County.*
- **Policy 12-31 – Bioenergy & District Heating** - *‘Facilitate the sustainable development of bioenergy plants including anaerobic digestors, in compliance with the development management standards on appropriately zoned lands. Bioenergy installations shall not be permitted in areas where such developments may affect residential or visual amenity. They should be developed close to the point of demand and be served by public roads with sufficient capacity to absorb increased traffic flows and adjacent to transport corridors’.*
- **Policy 12-37 – Community Consultation, Community Benefit & Community Projects** - *‘Support the principles of a Just Transition as the community moves towards a climate neutral society and economy’.*
- **Policy 12-38 - Community Consultation, Community Benefit & Community Projects** - *‘Support the transition towards low carbon economy and circular economy through mechanisms such as the Climate Action Competitive Fund and/or Just Transition Funding’.*

Chapter 2 (Climate Change & Achieving A Sustainable Future) of the CDP outlines KCC’s ambitions to *‘provide for the sustainable development of County Kerry in a way which supports people and employment while transitioning to a low carbon society...which safeguards and enhances the environment’*. It sets out the following policy objective for the county’s sustainable future:

- **Policy 2-2 – Climate Change and Achieving a Sustainable Future** – *‘Facilitate and support national climate change objectives contained in the Climate Action Plan 2021 and the actions contained in the KCC Climate Change Adaptation Strategy 2019-2024 and successor strategies, and to consider a variation of this development plan, if necessary, to align with the approach recommended in the guidelines: Development Plans, Guidelines for Planning Authorities’.*

Chapter 9 (Economic Development) of the CDP outlines KCC’s objectives to support the economic development of the County and sets out the *‘spatial planning framework which will deliver the required development patterns and maximise the conditions for sustainable economic development in Kerry’*. The Plan notes that *‘The Strategic Development Location (SDL) at Tarbert/Ballylongford in North Kerry is recognised for its potential as an Energy Hub and for industrial development at a regional and national level’*. It sets out the following policy objective to support the Strategic Development Location.

- Policy 9-26 Shannon Estuary – *‘Safeguard the role and function of the Power Plant Hub at Tarbert, including the NORA Strategic Oil Reserves Plant, as a key driver of economic growth in the Region, encouraging its sustainable growth and diversification, in accordance with Regional and National Energy Objectives’.*

2.5.2 Draft Local Authority Climate Action Plan 2024 – 2029

This Draft Action Plan sets out how the Local Authority will address the internal actions that are necessary to meet its own ambitious targets and the external actions that they will take to influence, facilitate and advocate for climate action. Within the context of the Plan, climate action is seen as two integrated responses that society has to take to meet the challenges of climate change. These are mitigation, which seeks to prevent the impacts of climate change and adaptation, which seeks to respond to the impacts of climate change.

With regard to the built environment and the authority’s activities in development management, the Draft Action Plan advances the following ‘Strategic Goal’ and corresponding objective:

- **1. Built Environment and Transport** – *‘The built environment and infrastructure are climate-proofed to ensure emissions and energy efficiency targets are met towards reaching a decarbonised society’.*
 - **Objective 1.6** – *‘Ensure the Planning Authority integrates climate action into Land Use Planning and Development Management’.*

The Proposed Development is very clearly in accordance with Local Policy, notably the objectives to support and facilitate the sustainable provision of a reliable energy supply in the county and to safeguard the role and function of the power plant hub at Tarbert in accordance with Regional and National energy objectives. It is consistent with European, National, Regional and Local policy and will contribute to meeting the urgent requirement for new flexible and clean dispatchable generation capacity. The Proposed Development will facilitate the integration of more renewable generation into the electricity network, helping to maintain security of supply while supporting the transition to a low carbon economy in Ireland.

2.6 References

- Department of Communications, Climate Action and Environment (DECC). (2015). *The White Paper: Ireland's Transition to a Low Carbon Energy Future 2015-2030*.
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SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 03 Need and Alternatives

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November 2023

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Table of Contents

3.	Need and Alternatives	3-1
3.1	Introduction	3-1
3.2	Need for the Proposed Development	3-2
3.3	Consideration of Alternatives	3-3
3.4	Summary and Conclusion	3-8
3.5	References	3-9

Plates

Plate 3.1: Initial Design Consent for the Proposed OCGT

Plate 3.2: Design Progression (Proposed Development avoiding buried cable easement)

Plate 3.3: Design Progression (Jetty removed from Proposed Development design)

3. Need and Alternatives

3.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) sets out the need and reasonable alternatives, including the design progression that was considered during the evolution of the Proposed Development, and the design process as presented in EIAR Chapter 5: Description of the Proposed Development. This chapter also sets out the reasons why the proposed design and layout was chosen and provides details of the design evolution that has taken place in order to avoid and / or reduce adverse environmental effects. In addition, this chapter discusses the need to maintain operational efficiency and cost-effectiveness, while considering other relevant matters including planning policy and available land.

Consideration of alternatives is an important aspect of the EIA process and is necessary to evaluate the likely environmental consequences of a range of development strategies for the Proposed Development Site within the constraints imposed by environmental and planning conditions, pursuant to Schedule 6 paragraph 1(d) of the Planning and Development Regulations 2001 (as amended) of the S.I. No. 296/2018 – European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (EIA Regulations).

3.1.1 Legislative Context

Annex IV (2) of the Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, as amended by EIA Directive 2014/52/EU (EIA Directive), requires the consideration of reasonable alternatives which are relevant to the project and taking into account the effects of the project on the environment.

It states under Article 5(1)(d) that:

‘a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment.’

The EIA Regulations require an EIAR to contain (under Schedule 6 paragraph 1(d)):

‘A description of the reasonable alternatives studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed development on the environment.’

The 2022 EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports state:

‘The objective is for the developer to present a representative range of the practicable alternatives considered. The alternatives should be described with ‘an indication of the main reasons for selecting the chosen option’. It is generally sufficient to provide a broad description of each main

alternative and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option. A detailed assessment (or 'mini-EIA') of each alternative is not required.'

In this context, the consideration of reasonable alternatives and design evolution has been undertaken with the aim of avoiding and/or reducing adverse environmental effects (following the mitigation hierarchy of avoid, reduce and, if possible, remedy), while maintaining operational efficiency and cost-effectiveness, and considering other relevant matters such as available land and planning policy.

This chapter considers the main alternatives for the Proposed Development and includes alternatives such as: the 'do nothing' scenario, alternative locations, alternative designs, and alternative layouts.

3.2 Need for the Proposed Development

As set out in EIAR Volume I Chapter 2, Ireland is in the process of transitioning from a centralised, fossil fuel-based electrical power generation model to a more distributed renewable-based generation system. The European Green Deal frames Europe's response to the challenges of climate change. Consistent with European (EU) policies the Irish Government has committed to achieving a 51% reduction in Ireland's overall Greenhouse Gas (GHG) emissions from 2021 to 2030 (an average 7% per annum reduction in overall GHG emissions), and to achieving net-zero emissions no later than 2050. The 2023 *Climate Action Plan*¹ features a roadmap to deliver on these climate ambitions.

Among the most important measures in the *Climate Action Plan 2023* (CAP23), is an increase in the use of electricity across transport and heating to reduce emissions in these sectors. The proportion of electricity generated from renewable sources will be increased to up to 80% by 2030.

Increasing future reliance on electricity to meet energy needs across transport, domestic and commercial sectors will increase the need for continued security of electricity supply. This is considered a priority at national level and within the overarching EU policy framework in which the electricity market operates. Security of electricity supply must be maintained throughout the transition to up to 80% of electricity consumption coming from renewable sources by 2030 on a pathway to net zero emissions. The *Policy Statement on Security of Electricity Supply*², published in 2021, sets out the key challenges facing the State in this regard and the policy decisions to be taken to address this.

The challenges, as set out in the Statement, include ensuring adequate electricity generation capacity, storage, grid infrastructure, interconnection and system services are put in place to meet demand (including at periods of peak demand) and ensuring diversity of fuel supply sources. The Proposed Development is designed specifically to respond quickly to shortfalls in power generation at times of high demand, utilising HVO as a sustainable alternative fuel source to gas or distillate oil, which have typically been relied upon to fuel OCGT plants in recent times.

The Policy Statement cites that most renewable energy generated by 2030 will be sourced from wind and solar. These sources of renewable energy are variable in nature and introduce intermittency to the electricity generation system.

¹ DECC (2022). *Climate Action Plan 2023 - Changing Ireland for the Better*

² DECC (2021b). *Policy Statement on Security of Electricity Supply*.

More wind, solar, storage and interconnection added to the transmission grid will mean that conventional generation plants, such as the Proposed Development, are expected to operate less. Therefore, conventional generation capacity such as the Proposed Development will spend much of its time in reserve, acting as a backup in the event it is needed such as when required to balance the system in times of high demand and low generation from wind and solar sources.

The Proposed Development will have the capacity to generate 350MW when required. It will provide quick response capabilities to EirGrid and will help to ensure that the grid network can continue to operate efficiently with the integration of more variable renewable energy sources. The Proposed Development will assist in facilitating the integration of more renewable generation into the electricity network, helping to maintain the security of supply and supporting Ireland in its transition to a low carbon economy.

The main objectives of the Proposed Development are to:

- assist the continued expansion of Ireland's renewable generation capacity.
- ensure the security of electrical power supply.
- respond quickly to shortfalls in power generation at times of high demand.
- provide support to the electricity supply system at times of peak demand and at times when other electricity generation sources are not sufficient to meet demand; and
- provide a low carbon flexible generation alternative by using HVO, a type of biofuel produced by processing waste oils to create a fossil-free alternative to gas or distillate oil in accordance with EU sustainability standards.

The Proposed Development will operate to support the electricity transmission system at times of peak demand and at times when other electricity generation sources are not sufficient to meet demand. It is likely therefore that the OCGT will remain on stand-by for the majority of the time and will only be called upon by the Transmission System Operator (TSO) as required to complement the Country's renewable power generation technology.

The need for the Proposed Development is recognised at national, regional, and local level as detailed in EIAR Chapter 2 Planning Policy, which provides a summary of relevant plans and policy documents.

3.3 Consideration of Alternatives

3.3.1 Introduction

This section provides an outline of the main alternatives considered by the Applicant in formulating the Proposed Development and sets out the key reasons for choosing the Proposed Development as outlined in this EIAR. Alternatives may be described at various levels:

1. 'Do Nothing' Scenario.
2. Alternative Locations.
3. Alternative Technical Solutions.

4. Alternative Layouts and Designs.
5. Alternative Mitigation Measures.

Pursuant to Section 3.4.1 of the EPA's guidelines, '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*'³, the consideration of alternatives also needs to be cognisant of the fact that 'in some instances some of the alternatives described will not be applicable - e.g., there may be no relevant 'alternative location'.

3.3.2 Do Nothing Scenario

The 'do nothing' scenario is a general description of the evolution of the key environmental factors of the Site and environs if a development / project did not proceed.

Under the 'do nothing' scenario, the Proposed Development would not be constructed, and the Applicant would be unable to generate electrical capacity from the Proposed Development, thus reducing security of supply for Ireland. As the existing Tarbert HFO Power Station will no longer operate after December 2023 and will no longer generate electricity to the grid, this would have an impact on the security of electricity supply for Ireland, increasing the potential risk of demand not being provided for.

The 'do nothing' scenario is assessed in Chapters 7 – 19 of this EIAR and provides a comparison where the environmental effects of the Proposed Development as set out in this EIAR would not occur.

3.3.3 Alternative Locations

The Proposed Development includes a responsive power generator which has the capacity to start up rapidly in order to fill temporary shortfalls between renewable power generation and demand. The reserve power generated by the Proposed Development will be critical to maintaining security of supply for the Irish Grid as it continues its transition to a renewables-based system.

The technology chosen requires suitable available land of sufficient dimensions, means to deliver fuel to the Site and a high voltage electrical grid connection.

SSE Generation Ireland Limited (SSE), the Applicant, owns, leases or manages the majority of the SSE Tarbert site. Existing connections to the electricity transmission system are available on the SSE Tarbert site immediately adjacent to (and a small section within) the Proposed Development, which is a key consideration in the Applicant selecting the SSE Tarbert site for the Proposed Development.

It should be noted that the Site of the Proposed Development, within an existing industrial setting, is on land which is zoned for Economic Development within the Tarbert-Ballylongford Landbank, which is a Strategic Development Location in the Kerry County Development Plan (CDP) 2022-2028. The specific objective is to:

“KCDP 9-25: Promote and facilitate the sustainable development of the Tarbert-Ballylongford landbank for industry, utilising the presence of deep water, existing infrastructure, natural resources, and waterside location to harness the potential of this Strategic Location. Proposals for marine related industry, general industrial development, and particularly those industries creating

³ EPA (2022). *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*.

a synergism with existing uses and contributing to the development of a strategic energy hub at this location will also be encouraged”.

Objective ‘KCDP 9-26’ of the Kerry CDP 2022-2028 confirms the objective of this economic development:

“Safeguard the role and function of the Power Plant Hub at Tarbert, including the NORA Strategic Oil Reserves Plant, as a key driver of economic growth in the Region, encouraging its sustainable growth and diversification, in accordance with regional and National Energy Objectives”.

The Proposed Development is clearly consistent with the existing use of the SSE Tarbert site, being a power station facility, and is also consistent with the strategic development objectives for the site and wider area.

Pursuant to Section 3.4.1 of the EPA’s guidelines, ‘Guidelines on the Information to be Contained in Environmental Impact Assessment Reports’⁴, the consideration of alternatives is cognisant of the fact that ‘in some instances some of the alternatives described will not be applicable - e.g., there may be no relevant ‘alternative location’. The availability of sufficient, suitable land under the control of the Applicant together with proximity to existing key infrastructure (connection to electricity transmission networks, proximity to national road network), renders the proposed footprint location on the SSE Tarbert site the most appropriate for the Proposed Development.

3.3.4 Alternative Technical Solutions

The Proposed Development aims to provide security of supply to the Irish electricity network in a manner that is complementary to the growing installed levels of intermittent renewable generation. This requires high availability of rapidly dispatchable generation capacity which can only be achieved, at large scale, using thermal plant. The maximum CO₂ emissions per kWh generated limits required by the Clean Energy Package⁵, as well as the emission limits required by the IED, result in gas or HVO fired generation being the only viable option.

Gas, however, was not considered viable to progress at the SSE Tarbert site currently due to the significant additional infrastructure and space which would be required, and which is not readily available due to existing infrastructure constraints and committed projects.

The fuel choice being progressed, HVO, is a type of biofuel produced by processing waste oils to create a fossil-free alternative to distillate-oil in accordance with EU sustainability standards. HVO biofuel is fossil free as it is derived from vegetable crops which have been converted to fuel. It is not excavated from the earth like fossil fuels such as coal, natural gas, or petroleum.

The alternative plant technology to the OCGT is medium speed engines, typically in the range of 10-18 MW. OCGT technology was selected over medium speed gas engines for the following reasons:

- Medium speed engines with a similar total output would require a larger physical footprint than a comparable OCGT. As such, the use of medium speed engines would limit the electrical output available on the Site.

⁴ EPA (2022). *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*.

⁵ https://energy.ec.europa.eu/topics/energy-strategy/clean-energy-all-europeans-package_en

- Medium speed engines generally have higher unabated NO_x emissions than OCGTs, requiring additional equipment and chemicals to deliver similar levels of emissions. Due to the increased number of generators, there are also generally more stacks required; and
- Engines require more cooling infrastructure than OCGTs, thus increasing the footprint of the generators.

3.3.5 Alternative Layouts and Designs

The layout of the Proposed Development on the SSE Tarbert Site is on an existing area of hardstanding previously used as a construction compound area and laydown area for the construction of the Tarbert HFO Power Station, site storage and, currently at time of submission of this EIAR, for a construction compound area and laydown area for the construction of the Tarbert Temporary Emergency Generation (TEG) Site. It will be vacant of this temporary use by mid-2024 and will revert to an open area of hard standing with some buildings located on the northern boundary associated with the Tarbert HFO Power Station to be demolished. Prior to the construction of the Tarbert TEG project the area was hardstanding with a number of storage facilities and workshops with an internal road providing a connection route parallel of the western side of the existing Tarbert HFO Power Station, and another road which provided an internal power station access route north-south of the SSE Tarbert Site.

The specific location within the SSE Tarbert site was chosen due to its availability in having limited built infrastructure and/or plant in place and provides the required footprint area for the OCGT and its associated infrastructure. In addition, the area is generally level, requires little in the way of site preparation (i.e., no cut and fill) and is in close proximity to connect to the existing 220kV transmission substation for connection to power export. Furthermore, the existing SSE Tarbert site as a whole benefits from close proximity to the national route network for road access (via the existing road access from the N67/N69 to the east and south).

The layout configuration of the Proposed Development for which planning permission is sought has been developed taking into consideration the constraints within the SSE Tarbert site. The Proposed Development configuration has evolved to avoid the easement associated with the buried 220kV cabling. This easement runs from the north of the island along the western side of the Proposed Development and existing ESB substation, then along the southern boundary of the ESB substation before running south partially across the lagoon and the eastern section of land connecting the island to the mainland. The Proposed Development design also avoids using land associated with the TEG development and historic areas of landfill. Plates 3.1 and Plate 3.2 demonstrate the design evolution and progression.

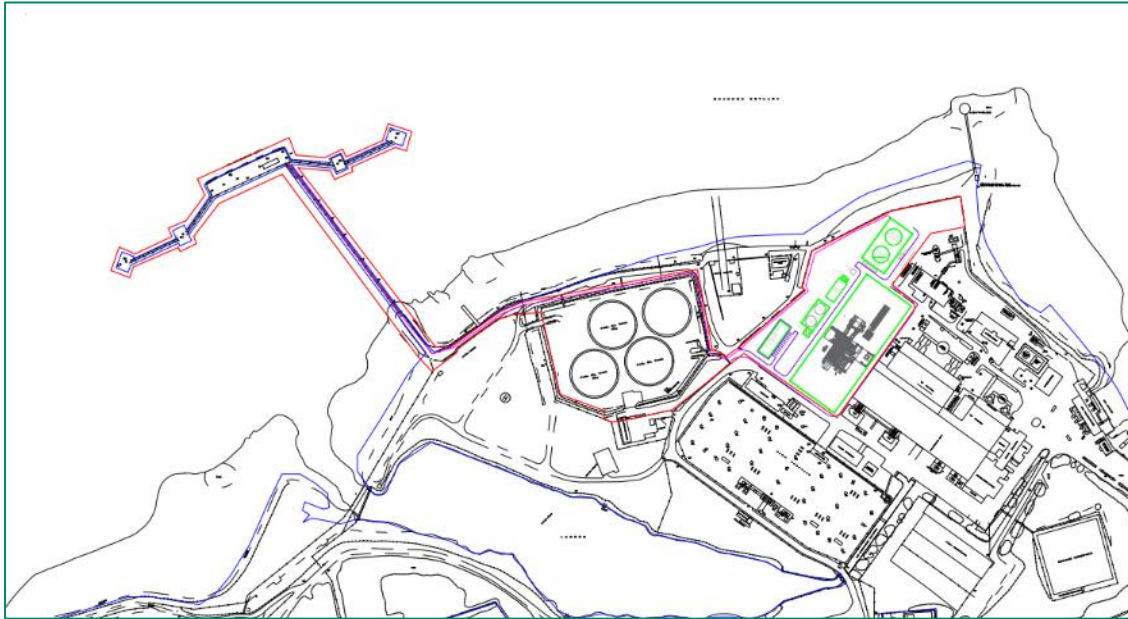


Plate 3.1: Initial Design Consent for the Proposed OCGT

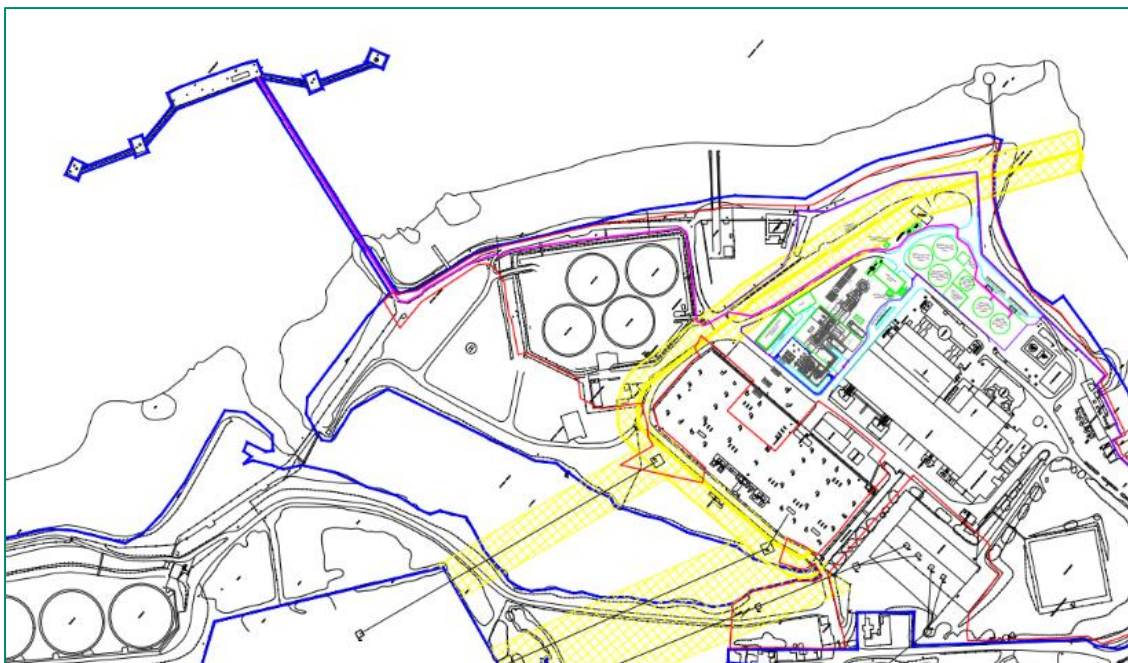


Plate 3.2: Design Progression (Proposed Development avoiding buried cable easement)

An alternative design that was considered for the Proposed Development included utilising the existing jetty on the western boundary of the SSE Tarbert site to enable fuel deliveries by sea. This design option was dismissed as the quantities of fuel required for delivery to Site will be highly variable depending on the operation of the unit, which will be dictated by grid requirements. It is likely that delivery volumes will be low and infrequent due to the 'back-up' nature of the plant, which would not be viable to source by sea. Fuel delivery by sea would only be viable for the initial fill of HVO for the Proposed Development to commence commissioning,

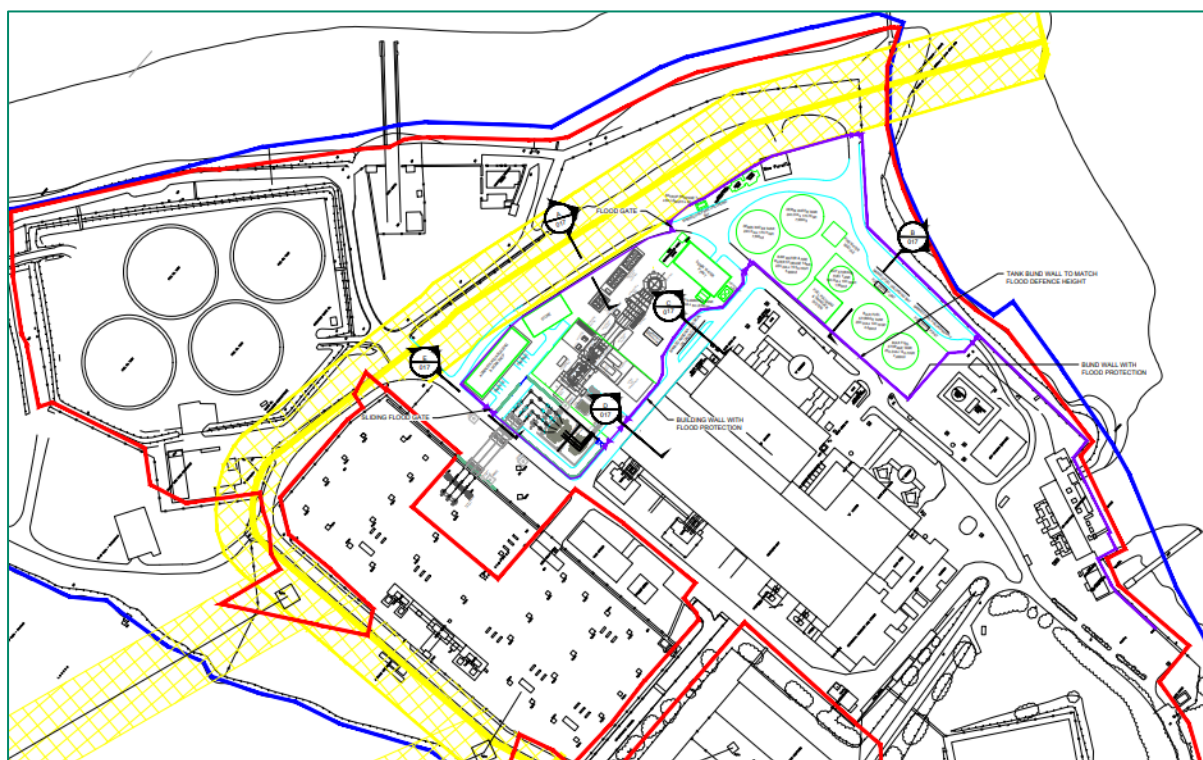


Plate 3.3: Design Progression (Jetty removed from Proposed Development design)

3.4 Summary and Conclusion

The 'do nothing' alternative was not considered an appropriate alternative, as there is a clear need for the Proposed Development.

The design of the Proposed Development was established taking into account the availability of suitable land within the existing SSE Tarbert Site, the most commercially and technically suitable technology to support security of supply, and site constraints including existing infrastructure and location of and proximity to the existing electrical substation.

The design evolution of the Proposed Development demonstrates that alternative fuels, technologies, and layouts were considered in the development of the design for the SSE Tarbert site, proposing and configuring technology to meet the needs of the energy market and utilising the space available.

Compared to conventional baseload power plant, Open Cycle Gas Turbine (OCGT) is considered the most appropriate technology for the Proposed Development at SSE Tarbert, due to its low footprint in relation to available area on Site, short construction time and ability to respond quickly to changes in electricity demand by mobilising and achieving full output within a short period of time. The OCGT unit will provide a very high-power density, minimising its physical scale and visual impact.

The supplied HVO will comply with the RED II (Directive (EU) 2018/2001) which provides specific sustainability criteria and the carbon intensity of individual biofuels, including an assessment of the feedstocks used and the emissions from its production, processing and supply, and will be certified accordingly by a third party. There are a number of HVO suppliers in Ireland that are certified in line with ISCC and RED II, which provide HVO for various uses. The Applicant will source its HVO from any one or more of these suppliers (refer to EIAR Volume I Chapter 5 and Chapter 17 for more information).

The Proposed Development will be developed as a commercial project for which a capacity contract has been obtained under the capacity auction process operated by the Commission for the Regulation of Utilities (CRU). This process acts as the principal method in securing new methods of electricity generation that are required to replace oil and coal fired stations, to support and facilitate the growth of renewable electricity and to ensure the security of electricity supply on the Grid.

3.5 References

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SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 04 Existing Site and Conditions

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November 2023

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Table of Contents

4.	Existing Site and Conditions	4-1
4.1	Introduction	4-1
4.2	Site Location	4-1
4.3	The Proposed Development Site.....	4-2
4.4	The Surrounding Area	4-2
4.5	Site History	4-2
4.6	Potential Environmental Sensitivities / Receptors	4-11
	References	4-15

Tables

Table 4.1: Site Planning History	4-3
Table 4.2: Planning Search within 5km of the Site.....	4-6

Appendices (EIAR Volume II)

No Appendix

Figures (EIAR Volume III)

Figure 4.1: Site Setting
Figure 4.2: Site Aerial
Figure 4.3: Constraints Plan
Figure 4.4: Planning search within 5km of the Site

4. Existing Site and Conditions

4.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) describes the Proposed Development Site and its location and setting, details of the surrounding area, site history and environmental receptors for the purpose of complying with Article 5(1)(a) of the EIA Directive.

For the purposes of the EIAR, the following terms are used to describe the Proposed Development:

- **The Proposed Development** – also referred to as ‘Tarbert Next Generation Power Station’ relates to the 1 no. Open Cycle Gas Turbine (OCGT) plant, fuel storage and unloading facility, water storage tanks, surface water drainage system, electrical grid connection to substation and all associated ancillary development, site works and services, for which planning permission is being sought, which will be submitted to ABP for determination. Full details are included in EIAR Chapter 5.
- **‘The Proposed Development Site’** – also known as ‘the red line boundary’ or ‘planning application boundary’ relates to the area where the Proposed Development is located as delineated by the red line boundary. Refer to EIAR Volume III Figure 1.1.
- **‘Tarbert HFO Power Station’** – is the existing power station built in the 1960’s which runs on heavy fuel oil (HFO), which will cease operating at the end of December 2023.
- **‘SSE Tarbert’** – relates to the wider Tarbert power station site which includes the Tarbert HFO Power Station (which will cease operating at the end of December 2023), the Temporary Emergency Generation (TEG) Power Plant (under construction), the National Oil Reserves Agency (NORA) mainland tank farm and the existing jetty facility; and
- **‘The TEG (Temporary Emergency Generation) Site’** – relates specifically to 3 no. OCGT plant with a combined output of 150MW under construction and which will be temporarily installed on an area of land within the SSE Tarbert Site (Planning Ref. ABP-315838). This plant will commence decommissioning in 2028/2029.

4.2 Site Location

The Site is situated at the SSE Tarbert Site, in the townland of Tarbert Island, Co. Kerry, Ireland (Irish Grid Reference X; 475237; Y: 5826671). The entire SSE Tarbert Site is located within the administrative area of Kerry County Council (KCC). The Proposed Development Site is bordered to the north, east and west by the Shannon Estuary. The existing Tarbert HFO Power Station, the island tank farm and a section of the 220Kv electrical substations are within the Proposed Development Site. The TEG Site and a National Oil Reserves Agency (NORA) mainland tank farm are located to the west and south-west of the Proposed Development Site boundary.

This chapter is supported by Figures 4.1 to 4.4 in EIAR Volume III.

4.3 The Proposed Development Site

The Site is within the boundary of the SSE Tarbert site. The Site comprises predominately brownfield land, a water reservoir, HFO pipelines, roads, car parks, chemical storage areas, fuel storage including the island tank farm and other low-level buildings associated with the existing Tarbert HFO Power Station main building.

Ground levels on the southern portion of the Proposed Development Site slope westwards from approximately 4.18m Above Ordnance Datum (AOD) in the east to 5.63m AOD in the west. The Site is 16.24ha and encompasses land within the SSE Tarbert site (the blue line boundary) which is an area of 42ha. Under the management of the Applicant.

The Proposed Development Site is accessed from the existing SSE Tarbert entrances off the N67 and will function independently of both the existing Tarbert HFO Power Station and the TEG Site. The N67 connects Co. Kerry with Co. Clare and Co. Galway via the Tarbert – Killimer ferry crossing, running in a north-west to south-east direction.

4.4 The Surrounding Area

The location of the Proposed Development Site is shown in Figure 4.1 and the general surroundings on Figure 4.2 (refer to EIAR Volume III). The following text includes details of the relevant features in relation to the Proposed Development Site:

- Within – Areas of hardstanding, outbuildings which vary between storage sheds and workshops, the existing Tarbert HFO Power Station, the island tank farm, staff car parking and visitor's car parking area, the northern and southern site entrances, part of the EirGrid 220kV electrical transmission substation, and the power station reservoir.
- North – Tarbert Lighthouse and the Shannon Estuary.
- East – the N67 National Secondary Road and the Shannon Estuary.
- South-east – the Tarbert – Killimer ferry terminal, the N67 National Secondary Road, and residential receptors.
- South – the TEG Site, a lagoon draining the Shannon Estuary and agricultural lands further south on the mainland.
- South-west – the TEG Site and the National Oil Reserves Agency (NORA) tank farm; and
- West – the Shannon Estuary.

4.5 Site History

The Tarbert HFO Power Station at SSE Tarbert was developed in the 1960's as a 626 MWe Heavy Fuel Oil (HFO) fired power plant, which had been operational since 1969. The SSE Tarbert Site is located on the southern shore of the Shannon Estuary, on Tarbert Island, originally agricultural land and made land (i.e., infilled/reclaimed land), connected to the mainland via a causeway.

There are four generating units at the Tarbert HFO Power Station, two with a capacity of 57 MWe each and two with a capacity of 256 MWe each. The Tarbert HFO Power Station was constructed in two stages, units one and two commissioned in 1969 and units three and four commissioned in 1976 and 1977 respectively. Units three and four were refurbished in 2003 and 2004 and are fuelled by HFO with both Gas Oil and propane used as a start-up fuel. Each of the units are independent and consist of a boiler, steam turbine and auxiliary plant.

There are a number of fuel storage tanks on and adjacent the SSE Tarbert Site. The 'Island Tank Farm' which is within the Site, comprises four HFO tanks (refer to Figure 4.2, EIAR Volume III), each with the capacity of 25,000 tonnes. At present, only two of these tanks are in use while the other two are currently not used. The 'Mainland Tank Farm' located 350m to the west of the Site includes four tanks these are not related to the power generation which occurs at SSE Tarbert and are under the control of the National Oil Reserves Agency (NORA) providing a national reserve.

The existing Tarbert HFO Power Station employee numbers have decreased over the years and there will be 14 staff employed on the SSE Tarbert Site as of Q3 2023, providing 24 hours per day, 365 days per year presence to operate and maintain SSE facilities on-site and to remotely control other SSE sites.

Table 4.1: Site Planning History

Planning Applications	Date Submitted	Summary Details	Applicant	Status
23350	31/03/2023	The proposed development will comprise of the following on a site measuring approximately 6.9 hectares: (1) removal of existing cable joint, bay within Tarbert generating station, 220kv switchgear within the existing Tarbert substation compound and associated 220kv cabling; (2) two no. new lengths of 220kv underground cabling measuring approximately 340m each, running between two no. new underground cable joint base in Tarbert generating station and the connection point at Tarbert substation; (3) the new 220kv switchgear bay within the existing Tarbert substation compound comprising associated electrical equipment, including cable sealing ends, insulators, overhead conductors, surge arrestors, lightning masts and lighting poles; and (4) all ancillary site development works	EirGrid Plc.	Not Determined yet (Decision Due Date 07/12/2023)

Planning Applications	Date Submitted	Summary Details	Applicant	Status
		including temporary construction compound and layout areas, site preparation works and ground levelling as required to facilitate the works. Tarbert generating station is licensed by the environment protection agency (EPA) under the industrial emissions (IE) license (ref: P0607-02). the proposed development includes works located within the i.e., license boundary of Tarbert generating station which is an upper tier establishment to which the chemicals act (control of major accidents hazards involving dangerous substances) regulations 2015 (the COMAH regulations) apply. this planning is accompanied by a natura impact statement (NIS).		
ABP-315838-23	17/02/2023	Application received under Section 4 of the Development (Emergency Electricity Generation) Act 2022 (the Act) for a designated development located at Tarbert Power Station, Tarbert, in the townland of Tarbert Island, Co. Kerry	SSE Ireland Ltd.	Granted Conditional 29/03/2023
18932	27/04/2018	Tarbert Island Tarbert Co Kerry construct a battery storage facility within a total site area of up to 2.278ha, to include 50 no. self-contained battery container units with associated HVAC cooling units, 13 converter and 13 step up transformer, a single storey substation / control building with welfare facilities, a cable route grid connection to the existing ESB substation building, maintenance lighting, security fencing, a CCTV monitoring system, and all associated ancillary infrastructure on lands within	SSE Renewables (Ireland) Limited	Granted Conditional 15/01/2019

Planning Applications	Date Submitted	Summary Details	Applicant	Status
		the Tarbert generating facility. A ten-year planning permission is being sought to construct the development.		
13477	31/07/2013	Alter existing 220Kv station consisting of new single storey control building, new diesel generator building, 3.no single storey modular buildings, 6.no gantry support structures 8 no. control and protection kiosks, 6 no. surge arrestors, 6 no. cable sealing ends, existing compound chain link fence and gates to be replaced with new palisade fence and gates, new holding tank and associated drainage and site works.	EirGrid Plc	Granted Conditional 23/09/2013
972500	04/12/1997	Erection of a sewage effluent treatment plant	Electricity Supply Board (ESB)	Granted Conditional 03/03/1998
921738	26/11/1992	Erect office extension	ESB	Granted Conditional 15/01/1993

4.5.1 Relevant Planning Applications

A review of planning applications within 5km of the Site was completed using the KCC, County Clare and County Limerick Online Planning Systems, and An Bord Pleanála online records, for applications submitted in the last five years. The 5km search area was used due to the rural nature of the area and the existing sparse development, other known developments with the possibility of having cumulative effects with the Proposed Development. Only existing and approved planning applications were considered. Table 4.2 provides details of the planning applications identified by the review.

Table 4.2: Planning Search within 5km of the Site

Planning Application	Date Submitted	Summary Details	Applicant	Status	Distance from the Site
23350	31/03/2023	The Proposed Development will comprise of the following on a site measuring approximately 6.9 hectares: (1) removal of existing cable joint, bay within Tarbert generating station, 220Kv switchgear within the existing Tarbert substation compound and associated 220Kv cabling; (2) two no. new lengths of 220Kv underground cabling measuring approximately 340m each, running between two no. new underground cable joint base in Tarbert generating station and the connection point at Tarbert substation; (3) the new 220kv switchgear bay within the existing Tarbert substation compound comprising associated electrical equipment, including cable sealing ends, insulators, overhead conductors, surge arrestors, lightning masts and lighting poles; and (4) all ancillary site development works including temporary construction compound and a layout areas, site preparation works and ground levelling as required to facilitate the works. Tarbert generating station is licensed by the Environment Protection Agency (EPA) under the Industrial Emissions (IE) License (Ref: P0607-02). The Proposed Development includes works located within the IE License Boundary of Tarbert Generating Station which is an Upper Tier Establishment to which the Chemicals Act (Control of Major Accidents Hazards Involving Dangerous Substances) Regulations 2015 (the COMAH Regulations) apply. This planning is accompanied by a Natura Impact Statement (NIS).	EirGrid PLC	Further Information Requested	Within the site boundary.
EE08.31583 8	17/02/2023	Application received under Section 4 of the Development (Emergency Electrical Generation) Act 2022 (the Act) for a designated development located at Tarbert Power Station, Tarbert, in the townland of Tarbert Island, Co. Kerry.	SSE Generation Ireland Ltd.	Granted Conditional 29/03/2023	0m adjacent Site boundary.
2332	23/01/2023	For development within the Moneypoint Generating Station, Carrowdotia North and Carrowdotia South, Kilimer, County Clare (Eircode V15 R963) which is licenced by the Environmental Protection Agency (EPA) under an Industrial Emissions (IE) Licence (Re P0605-04) and Upper tier COMAH site and therefore falls under the requirements of the Control of Major Accident Hazard Regulations (COMAH) Regulations, 2015.	Electricity Supply Board (ESB)	Granted Conditional 15/03/23.	3.66km north-west.

Planning Application	Date Submitted	Summary Details	Applicant	Status	Distance from the Site
		The development, which will be located at various locations within the station complex, will consist of land-based Site Investigations (SI) works comprising of boreholes and trial pits across the site.			
21549	25/05/2021	A high inertia synchronous compensator (HISC) compound containing 1 no. HISC unit enclosed within a steel clad framed style structure (12.1m max height) and supported by 8 no. electrical equipment containers (containing ancillary power supply products including a static frequency converts, mv switchgear, exciters, lv distribution, control room, welfare and office, main auxiliary and start-up electrical transformers, generator circuit breaker, switchgear equipment, external cooler units and 1 no. back up diesel generator and associated diesel storage tank; (b) 220Kv high voltage gas insulated switchgear (GIS) substation compound containing a GIS substation building with all control and hv equipment within a single storey building (13.2m max height). The building will be surrounded by a compound road and contained within a 2.6m high galvanised steel palisade fence; (c) a battery storage compound containing 5 no. battery storage containers, enclosed in steel containers of dimensions approximately 13m by 2.5m by 3m, housing individual battery components with 2 fitted external HVAC systems for each unit and supported by 13 no. inverter stations, 14 no. auxiliary transformers and control container; (d) 220kv underground cable to the existing adjoining EirGrid substation; (e) associated elements comprising various underground cables and ducts, equipment plinths, boundary security fence, compound lighting and palisade gates and fencing, security lighting, CCTV, internal access roads, hardstanding areas and all necessary foundations works for the above compounds. The planning application is on lands where grid stabilisation facility was previously permitted under planning register no 19/115. Planning permission to construct the development is sought for a period of 10 years. A Natura Impact Statement has been prepared in respect of the Designated Development and accompanies the application.	Donal Murphy Glencloosagh Energy Limited	Granted Conditional 19/07/21	1.7km south- west

Planning Application	Date Submitted	Summary Details	Applicant	Status	Distance from the Site
20850	18/09/2020	For changes to the previously permitted peak power plant development (planning ref. 13/138). It is proposed to change the energy source for the charging of the battery storage system (BESS) containers from diesel to charging off the national grid and to change the permitted layout for electrical equipment based on the consequence of the proposed change in energy source at an area located within the permitted development. It is also proposed to include a small metering enclosure adjacent to the constructed substation building within the permitted development. A five-year planning permission is being sought for the Designated Development.	Kilpadouge Green Energy Ltd	Conditional 12/11/2020.	1.75km south-west
19746	26/09/2019	For development, on a c. 1.8 ha site located within Moneypoint Generating Station, Carrowdotia North and Carrowdotia South, Kilimer, County Clare (Eircode V15 R963) which is licensed by the EPA under an Industrial Emissions (IE) Licence (Ref. P0605-04) and Upper Tier COMAH site and therefore falls under the requirements of the Control of Major Accident Hazard Regulations (COMAH), 2015. The Development, which will be located within a fenced compound c. 0.94ha. will consist of a 300 to 400 MVA (electrical rating) synchronous condenser, including the following elements: a) a generator and Flywheel building (c. 962 sq.m., c.15m high) to house equipment including the generator, flywheel lube oil skid, air compressor and pumps; b) supporting items of plant located within the compound including *cooling equipment (c. 690 sq. m., c. 3m high); c* 7m high modular containers to house electrical and control equipment (total area of c 384sq.m); * a generator step-up transformer (c.150 sq. m, c. 3m high); *c 7m high modular containers to house electrical and control equipment (total area of c. 384 sq.m); *a generator step-up transformer (c.150 sq. m c.8m high), auxiliary transformer (c.48 sq. m., c.3m high); and * an above-ground oil separator and collection pit (c.72sq.m) connections to existing site services networks including electrical, water and wastewater and an underground surface water attenuation tank connecting to existing surface water drains; c) all other ancillary and miscellaneous site works including site clearance; site access, internal roads and development of areas of hardstanding including a maintenance lay-down area; and d) the development will be bounded by a c.3m high chain-link fence. Site access will be by means of a new c. 2.7m high palisade	ESB	Granted Conditional 20/11/2019.	4.24km north-west.

Planning Application	Date Submitted	Summary Details	Applicant	Status	Distance from the Site
		gate accessed from existing roads within the station site. Planning permission is being sought for a duration for a duration of 10 years.			
19115	12/02/2019	The development will consist of a grid stabilisation facility comprising of the construction up to 4 no. rotating stabilizers, 5 no. battery storage containers, 1 no. control room, 2 transformers and ancillary equipment within a site area of approx. 1.46 hectares. It is proposed to connect the Designated Development to the adjacent EirGrid substation by underground cable which will traverse the permitted and under construction peaking plant. The rotating stabilisers will be supported by 10 no. electrical equipment rooms which will contain ancillary power supply products including a static frequency convert (SFC), mv switchgear, exciters and lv distribution, and step-up / down transformers. A heating ventilation and air conditioning system (HVAC) will be attached to each rotating stabiliser, 4 no. auxiliary transformers also proposed. The battery containers will house individual battery components with 2 no. fitted external HVAC system for each. 13 no. inverter stations and 14 auxiliary transformers are proposed for the battery containers. The entire site will consist of various underground cables and ducts, boundary securing fence, compound lighting and palisade gates and fencing, new internal access track, security lighting, CCTV, hardstanding areas and all necessary foundation works. Permission is also sought for 2 electrical transformers (up to 220kv), associated hv equipment and underground electrical grid connection cabling and ducting connecting the development to the national grid at the adjacent ESB/EirGrid substation. Planning permission is sought for a period of 10 years. A Natura Impact Statement accompanies this application.	Glencloosagh Energy Limited	– Granted Conditional 25/10/2019	1.65km south-west
18520	21/06/2018	The development will consist of a c7.5 MW capacity battery storage facility within a secured compound, on a 0.4 Ha site, and will subject to detailed design, commercial and technical considerations, include (a) up to 3 No. battery storage units (each typically comprising a containerised battery (c 12.2m x 2.5m x 3.2m), HVAC (c2.7m x 2.7m), inverter (c. 3m x 3m) and transformer (c 3.3m x 3.3m); (b) a 28 sq. m single-storey switchgear building; (d) ancillary electrical plant including a transformer and var support units; (e) a c.15.6m high lightning mast and c. 18m high SCADA communications mast; (f) a 2.6m high chain-link fence and	ESB	Granted Conditional 24/07/2018	Approximately 4.5km north-west of the Site

Planning Application	Date Submitted	Summary Details	Applicant	Status	Distance from the Site
		vehicular access gates via the existing station road to the south of the site; (g) ancillary site works including site clearance and the installation of site services.			
18392	27/04/2018	Tarbert Island Tarbert Co Kerry construct a battery storage facility within a total site area of up to 2.2278ha, to include 50 no. self-contained battery container units with associated HVAC cooling units, 13 converter and 13 step up transformer container units, associated compound cabling and ducting, a grid transformer, a single storey substation / control building with welfare facilities, a cable route grid connection to the existing ESB substation building, maintenance lighting, security fencing, a CCTV monitoring system, and all associated ancillary infrastructure on lands within the Tarbert generating facility. A ten-year planning permission is being sought to construct the development.	SSE Renewables (Ireland) Limited	Granted Conditional 15/01/2019	Within the Site boundary.
18878	10/09/2018	For a 10-year permission to construct a battery energy storage system (BESS) facility on a total site area of up to 0.6ha that will provide grid balancing services to the Irish electrical grid, to include up to 26 no. self-contained battery container units with associated heating ventilation and air conditioning systems (HVAC), power conversion systems (PCS), step-up transformers, control systems and ancillary electrical components, 1 no. single – storey substation control building and associated electrical infrastructure, 1 no. 110 kv generator transformers, all necessary ground and foundation works, associated compound cabling and ducting, palisade security fencing and lighting, CCTV security cameras, new site access from existing private road, temporary construction compound and all associated ancillary infrastructure and site development works. A Natura Impact Statement is now submitted in support of the application.	Shannon Clean Tech Ltd	Granted Conditional 23/09/2019	1.86km south-west

4.6 Potential Environmental Sensitivities / Receptors

A number of environmental receptors relevant to the assessment have been identified within and outside the Site. All distances given are the shortest distance between receptor and the Proposed Development Site.

Key receptors for each topic area have been identified as part of the assessment process and details are included in the relevant technical chapters (Chapters 7 – 19 of this EIAR). A summary is provided in the following sections.

4.6.1 Residential and Human Health Receptors

There are two residential receptors adjacent (0m) to the Proposed Development Site (refer to Figure 7.4 in EIAR Volume III). The measurements are taken from the closest section of the Site boundary to the perimeter of the receptor (i.e., fence/ hedgerow). These properties comprise:

- Dwelling located off the N67 adjacent to the south of the Site boundary (0m distance).
- Dwelling located off the N67 adjacent to the south of the Site boundary (0m distance); and
- Dwelling located off the N67 approximately 260m south of the Site boundary.

There are three villages or hamlets located in the wider rural area of the Site:

- Tarbert (approximately 1.8km south)
- Kilpadogue (approximately 1.75km south-west)
- Kilmurey (approximately 3.18km south-east)

There are no areas of community land zoned within 100m of the Site.

Potential effects on residential receptors are considered in Chapter 7 (Air Quality), Chapter 10 (Landscape and Visual), Chapter 11 (Noise and Vibration), and Chapter 15 (Population on Human Health).

4.6.2 Designated Nature Conservation Sites

The European sites identified as relevant based on proximity and factors such as the hydrological connectivity and the potential connection to the Site due to mobile Qualifying Interests (QI) / Special Conservation Interests (SCI) that may be associated with the habitats within the Zone of Influence (Zoi) of the Proposed Development.

Based on this selection criteria, seven European sites are located within the Zoi of the Proposed Development:

- River Shannon and River Fergus Estuaries SPA (004077) – 0km – SPA within Site boundary.
- Lower River Shannon SAC (002165) – 0km – immediately adjacent to Site boundary

- Stack's to Millaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161) – 6.6km south-east
- Moanveanlagh Bog SAC (002351) – 13.9km south
- Blasket Islands SAC (002172) – 89km south-west, 95km hydrological connection
- Kilkieran Bay and Islands SAC (002111) – 70km north, 117km hydrological connection
- Slyne Head Islands SAC (000328) – 106km north-west, 134km hydrological connection.

Potential effects on biodiversity are considered in Chapter 9: Biodiversity of this EIAR and potential effects on European sites are presented in Appendix 9B of EIAR Volume II.

4.6.3 Transport Receptors

The main roads that are surrounding the Site are as follows:

- N67 (National Secondary Road) – connects Co. Kerry with Co. Clare and Co. Galway, running in a north-west to south-east direction, approximately 310m south of the Site.
- N69 (National Secondary Road) – connects Tralee in Co. Kerry with Limerick City running in a northerly direction from Tralee to Tarbert and an easterly direction towards Limerick and vice versa, approximately 2km south of the Site.
- L1010 (Coast Road) – connects with the R551/ N67 in Tarbert and the R551 / R552 in Ballylongford Village, approximately 2km to the south of the Site.

The Proposed Development will be accessed via the existing SSE Tarbert site entrances off the N67 (the main site entrance and the secondary site entrance).

Potential effects on transport receptors are considered in Chapter 14: Traffic and Transport of this EIAR.

4.6.4 Air Quality Receptors

The study area of the assessment of construction dust has been applied within the air quality chapter of this EIAR. The Institute of Air Quality Management (IAQM) guidance (2014) extends the zone of potential impact:

- Up to 350m beyond the Site boundary and 50m from the construction traffic route (up to 500m from the Site entrances) for human health receptors; and
- Up to 50m from the Site boundary and/or construction traffic route (up to 500m from the Site entrances) for ecological receptors.

The potential dust generating activities could potentially occur in any direction relative to the Site depending on meteorological conditions during any randomly occurring event. Receptors are located within a predominantly rural area, the closest residential property being adjacent to the Site boundary, where the baseline dust soiling environment would be expected to be high. The River Shannon and River Fergus Estuaries SPA is adjacent the Site boundary (0m distance) and the Lower River Shannon

SAC is also 0m distance from the Site boundary. However, both ecological receptors are tidal and are regularly submerged by the tide, as a result any dust particles which travel beyond the Site boundary are likely to be routinely washed away with the tide.

There is the potential for impacts and nuisance from construction traffic, clearance demolition, construction dust, earthworks and track out generated during the construction phase of the Proposed Development.

Potential effects on air quality receptors are considered in Chapter 7: Air Quality of this EIAR.

4.6.5 Land and Soil Receptors

The nearest Water Framework Directive (WFD) designated feature is the Lower Shannon Estuary WFD transitional water body (IE_SH_060_0300), which surrounds the Site to the north, east and west.

The Proposed Development is largely underlain by dark grey Shannon Group of undifferentiated mudstones, siltstones, and sandstones. Bedrock outcrops are shown along the shoreline to the north and west. Fault lines are not indicated to be present in the area.

The dark grey Shannon Group bedrock units are assigned Moderate vulnerability to contamination.

The bedrock aquifer underlying the Site is classified by the GSI as a 'Locally Important Aquifer (Li)' where the bedrock is moderately productive only in local zones. Groundwater elevations indicate that groundwater flow on Tarbert Island is radial towards the surrounding waterbodies (AECOM, 2022), with groundwater being brackish/saline (the 2023 site investigation reported groundwater chloride concentrations between 70 and 452 milligrams per litre – EIAR Volume II, Appendix 13A) and likely to be tidally-influenced. The Site is not located in a groundwater source protection area.

A significant portion of the island is underlain by Made Ground, with natural topsoil and subsoils in the surrounding area consisting of till derived from sandstone and shale.

Potential effects on geology and hydrogeology receptors are considered in Chapter 13: Soils and Geology of this EIAR.

4.6.6 Water Environment Receptors

The Site falls within the Lower Shannon Estuary South WFD surface water catchment (CATCH_ID 24) and the Ballylongford WFD Groundwater body (European Code IE_SH_G_030). The Site is in the Ralappane sub-basin and the following surface water bodies are recorded:

- A river waterbody is at 1.7km to the south of the Site and is named Tarbert_010. This waterbody consists of a series of drainage ditches or streams which collate west of Tarbert village in a water source referred to as Doonard Lower, before discharging into the Shannon Estuary at Tarbert.
- A river waterbody (Farranmiller_010) located at 1.8km to the south of the Site.

Potential effects on water environment are considered in Chapter 12: Water Environment of this EIAR.

4.6.7 Cultural Heritage

There are two archaeological assets recorded within the boundary of the Proposed Development Site (refer to EIAR Volume III Figure 8.1). The first is the Tarbert Island Battery (KE003-001) which was demolished when the existing Tarbert HFO Power Station built over it. The second is a burial (KEE003-068) which was uncovered during construction works in May 1965. The burial was located under a flagstone 1.2m below ground level and 5.5m from the shoreline of the Shannon Estuary. Cultural heritage and archaeological assets within a 1km zone from the Proposed Development Site (the area within which assets could experience setting impacts from the Proposed Development) include:

- 2 assets recorded as Protected structures.
- 2 assets recorded as buildings on the national Inventory of Architectural Heritage; and
- 1 asset recorded as Planned Landscapes on the National Inventory of Architectural Heritage.

Potential effects on cultural heritage and archaeology receptors are considered in Chapter 8 of this EIAR.

4.6.8 Landscape Receptors

The Kerry County Development Plan 2022- 2028 subdivides the county into landscape character areas. The Proposed Development is located within landscape type “J – Urban Area”. Adjacent agricultural lands to the south are classified as “C – Pasture with mature hedgerows” and the parcel of woodland around Tarbert House is identified as “G – Deciduous Woodland”, which is considered a valuable resource in terms of both biodiversity and by contributing to a varied, interesting and attractive landscape.

Views experienced from locations such as settlements, recognised routes and popular vantage points used by the public have been included in the assessment. Receptors are the viewers at these locations. The degree to which receptors, i.e., people, will be affected by changes as a result of the Proposed Development depends on several factors.

Potential effects on landscape receptors are considered in Chapter 10: Landscape and Visual of this EIAR.

4.6.9 Noise and Vibration Receptors

The nearest noise sensitive receptors to the Proposed Development Site boundary are (as presented on Figure 4.2, refer to EIAR Volume III):

- Residential properties 245m south from the transformer wall boundary.
- Residential property 505m south from the transformer wall boundary.
- Residential property 1050m south-west from the transformer wall boundary.

Potential effects on noise and vibration receptors, as well as cumulative impacts, are considered in Chapter 11: Noise and Vibration of this EIAR.

References

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SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 05 Description of the Proposed Development

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Table of Contents

5.	Description of the Proposed Development	5-1
5.1	Introduction	5-1
5.2	Components of the Proposed Development	5-2
5.3	Construction Phase	5-12
5.4	Operational (inc. Commissioning) Phase	5-17
5.5	Decommissioning Phase	5-20
5.6	References	5-21

Tables

Table 5.1: Development Phases	5-14

Appendix (Refer to EIAR Volume II)

Appendix 5A – Construction Environmental Management Plan

Appendix 5B – Lighting Plan

Appendix 5C – Wastewater Treatment Plant Brochure

Figures (Refer to EIAR Volume III)

60695232-TBT-DR-001 – Proposed Site Plan

60695232-TBT-DR-002A – Proposed existing site elevations

60695232-TBT-DR-002B – Proposed site elevations A, B, C, D

60695232-TBT-DR-002C – Proposed site elevations (without flood wall) – A, B, C, D

60695232-TBT-DR-004 – Existing site plan – proposed buildings to be demolished

60695232-TBT-DR-005 – Site services layout

60695232-TBT-DR-009 – Proposed admin building, workshop, plan, elevations and sections

60695232-TBT-DR-011- Proposed Demin water plant, plan, elevations and sections

60695232-TBT-DR-013 – Gas turbine unit, plan, section and elevations

60695232-TBT-DR-015 – Fuel tanks, plan, elevations and sections

60695232-TBT-DR-016 – HV connection and transformers, plan and elevations

60695232-TBT-DR-019 – Proposed flood defence sections

60695232-TBT-DR-020 – Proposed flood defence structures

60695232-TBT-DR-022 – Proposed Lighting overall plan

5. Description of the Proposed Development

5.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) provides a detailed description of the Proposed Development, which consists of an Open Cycle Gas Turbine (OCGT) power plant, administration building and workshop, ancillary plant, site works, services, grid connection and demolition of ancillary buildings associated with the existing Tarbert Heavy Fuel Oil (HFO) Power Station on land within the SSE Tarbert site, in the townland of Tarbert Island, Co. Kerry (as described in more detail in Section 5.2).

The Proposed Development includes an OCGT (350MW) plant fuelled by Hydrotreated Vegetable Oil (HVO). The power output of the plant will be controlled and limited to a maximum of 350MW. The OCGT will be located within the existing established and operational SSE Tarbert site. The Proposed Development will include an overhead cable 75m in length, which will connect to an existing electrical substation to the south of the proposed OCGT building. There will be no alterations to the electricity transmission system outside of the Proposed Development Site as part of the Proposed Development.

The application boundary (Red Line Boundary) for the Proposed Development Site comprises an area of 15.18 hectares (ha.) and lies within the SSE Tarbert site ('SSE Tarbert'), which is an area of 42ha. with the majority of the area being under the control of SSE Generation Ireland Limited (here in referred to as 'the Applicant'). The Proposed Development will connect to an existing electrical substation within the Proposed Development Site.

The main objectives of the Proposed Development are:

- to support the security of electrical power supply.
- to support the continued expansion of Ireland's renewable generation capacity; and
- to provide support to the electricity supply system at times of peak demand and at times when other electricity generation sources are not sufficient to meet demand.

The Proposed Development will remain on stand-by for the majority of the time and will run to complement the Country's power generation technology, as required up to a maximum of 1800 hours per annum.

The construction phase of the Proposed Development is outlined in Section 5.3. A detailed construction programme will be determined by the appointed Contractors, in accordance with the proposed construction programme presented in Section 5.3.1.2. The proposed construction programme is presented in Section 5.3.1.2, including construction phases and key milestones and provides a robust basis for assessment purposes.

The Proposed Development will be assessed, and a review undertaken as to extending its operational life (depending on system need) or decommissioned. Upgrading / extending its operational life, is likely

to involve the replacement of key components such as the OCGT and will be subject to the applicable planning policy requirements at the time the works are intended to be carried out. A decision on extension of the operational lifetime or decommissioning of the Proposed Development is expected to be made after 25 years operation approximately, refer to Section 5.5.

This chapter of the EIAR describes the characteristics of the Proposed Development, together with the proposed design parameters. In accordance with Article 5(1)(a) of Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, as amended by EIA Directive 2014/52/EU (EIA Directive), the description of the project must comprise:

‘...information on the design, size and other relevant features of the project’.

This chapter of the EIAR is supported by figures which detail the Proposed Development layout and design¹, refer to Volume III of the EIAR. The following list are of some of the Planning Drawings submitted with this application, relevant to the EIAR.

- 60695232-TBT-DR-001 – Proposed Site Plan
- 60695232-TBT-DR-002A – Proposed existing site elevations
- 60695232-TBT-DR-002B – Proposed site elevations A, B, C, D
- 60695232-TBT-DR-002C – Proposed site elevations (without flood wall) – A, B, C, D
- 60695232-TBT-DR-004 – Existing site plan – proposed buildings to be demolished
- 60695232-TBT-DR-005 – Site services layout
- 60695232-TBT-DR-009 – Proposed admin building, workshop, plan, elevations and sections
- 60695232-TBT-DR-011 - Proposed Demin water plant, plan, elevations and sections
- 60695232-TBT-DR-013 – Gas turbine unit, plan, section and elevations
- 60695232-TBT-DR-015 – Fuel tanks, plan, elevations and sections
- 60695232-TBT-DR-016 – HV connection and transformers, plan and elevations
- 60695232-TBT-DR-019 – Proposed flood defence sections
- 60695232-TBT-DR-020 – Proposed flood defence structures
- 60695232-TBT-DR-022 – Proposed Lighting overall plan

5.2 Components of the Proposed Development

The Proposed Development will consist of the following components:

- OCGT power plant (350MW) and associated building (40m x 57m x 30m high) including air intake.
- Emissions stack 55m in height (external diameter 9m) with continuous emissions monitoring systems (CEMS) platform.
- Selective Catalytic Reduction (SCR) with air intake filters, dilution fans, and skid.

¹ Note: Full scale drawings have been included in the Planning Statement and planning submission accompanying the EIAR.

- Generators fin fan coolers (OCGT) (23m x 6.4m x 6m high).
- Lube oil fin fan coolers (7m x 7.5m x 5m high).
- One unit transformer and one grid transformer with a firewall (20m x 0.6m x 15m high) separating.
- Fire suppression skid.
- Aqueous ammonia tank (2.5m diameter x 5m length).
- Propane gas tank and compound (2m diameter x 4.6m length).
- Demineralised water treatment plant (15m x 30m x 12m high).
- Demineralised water tanks (23m diameter x 18m high) (2 No. x 7,500m³ capacity).
- Raw water and fire storage water tank (21m diameter x 17 high) (5,900m³ capacity).
- Fire water module (10m x 10m x 8m high).
- HVO fuel storage tanks 3 No. tanks in total, 1 x 1500m³ capacity (14m diameter by 10m high) and 2 x 4,400m³ capacity (20m diameter x 14m high) with two unloading bays.
- Fuel polishing and transfer system building (20m x 15m x 8m high).
- HVO pipework (approximately 200m) underground in culverts
- Electrical connections from main transformer (unit) to an existing 220Kv substation (75m overhead cables).
- New wastewater treatment plant (underground).
- Administration building and workshop (40m x 13m x 5m high).
- Stores (25 x 12.5m x 10m high).
- Carparking (eight x spaces to the front of the administration and workshop building totalling 100m²).
- Flood defence wall and gates; and
- Demolition works.

In connection with and in addition to the above, the following infrastructure will be included as part of the Proposed Development:

- Internal roads.
- CCTV.
- external lighting, including lighting columns (6m in height).
- security fencing (2.4m high) and gates (1.15m high); and
- utilities, pipes, cables and surface water drainage connecting to existing outfalls.

During the operational phase of the Proposed Development, HVO will be combusted as the fuel in a gas turbine (operating in open cycle mode) that drives a generator to produce electricity. The gas turbine utilises the Brayton thermodynamic cycle, using air as the working fluid. Air at atmospheric pressure enters the gas turbine compressor and is compressed before fuel and water is then added to the combustor. The resulting combustion flue gases are expanded across the turbine to drive the generator. The emissions reduction will occur via the SCR process, to meet relevant emission requirements, before emission release to the atmosphere via the stack.

The gas turbine technology proposed facilitates fast plant start-up durations and can provide response capability in a timely fashion to support sudden fluctuations in electricity demand on the electricity grid and to support security of supply. The Proposed Development will not exceed 350MW net electrical output, and this will be controlled through a plant management system.

The gas turbine and associated auxiliaries will utilise BAT (Best Available Technology) combustion technology to ensure that exhaust emissions to atmosphere comply with the relevant IE licence requirements. A Continuous Emissions Monitoring System (CEMS) will be provided on the flue gas emissions stack for monitoring in accordance with EPA requirements.

The Proposed Development will be available to operate 24-hours per day, seven days per week with the exception of periods of scheduled and unscheduled outage such as for maintenance activities. However, the expected operation of the plant will be non-continuous, operating only as and when required. The Proposed Development will operate during period when other sources of electricity generation are not capable of meeting demand.

The following section provides a description of the principal elements of the Proposed Development proposed plant, equipment, processes and operating procedures.

5.2.1 Open Cycle Gas Turbine (OCGT)

The technology proposed will be an Open Cycle Gas Turbine (OCGT) and generator package that will deliver 350MW of power generation to facilitate fast plant start-up durations and can provide response capabilities in a timely fashion to support sudden fluctuations in electricity supply to the electricity grid.

The proposed technology consists of a gas turbine generator being installed within a building 40m by 57m with a height of 30m. The gas turbine is connected to the generator on-site. Refer to drawing 60695232-TBT-DR-013.

A localised control module will be provided for the OCGT associated gas turbine power, electrical, and instrumentation, connected to the administration building proposed to be constructed to the west of the OCGT unit.

5.2.1.1 Air Intake

Large volumes of filtered air are required for efficient and reliable operation of the OCGT unit.

The air intake will draw in air via louvres on the southern facing wall surface of the OCGT building and will pass it through up to two layers of filtration during operation to remove entrained particles from the air. The air intake dimensions are 15m x 11.5m. These filters become loaded with entrained particles

and will require periodic cleaning or replacement, which will be undertaken when the OCGT unit is offline (refer to drawing 60695232-TBT-DR-013).

During cold weather, the air intake structures may be prone to icing up which reduces air flow through the structure and consequently the power output of the OCGT. To mitigate ice build-up on the structure it will incorporate de-icing equipment that will either use induction elements or hot air to warm the surface of the intake structure during operation. This system is only expected to operate when the OCGT is operational.

5.2.1.2 Emissions Stack

The proposed 1 no. emissions stack will be 55m high (the top of stack will be at 61.35m AOD) and 9m in external diameter (8m internal width) and will be constructed for the OCGT, in the north-west section of the Proposed Development Site, to the west of the existing Tarbert HFO Power Station building. The uppermost point of the flue will be stainless steel lined to prevent corrosion. Detailed air dispersion modelling has been carried out to inform the stack height and is discussed in Chapter 7 (Air Quality) EIAR Volume I. The proposed emissions stack is presented on the following Drawings, submitted with this application:

- 60695232-TBT-DR-001
- 60695232-TBT-DR-002B; and
- 60695232-TBT-DR-013

The emissions stack structure is designed to accommodate high emission gas temperatures. The stack will be double skinned with a layer of insulation between the inner and outer cylinders, this minimises heat transfer to the surrounding structure and reduces discolouration of the stack exterior over time.

A combination of the high exhaust gas temperature, low NO_x content, and absence of visible combustion particulates mean that the proposed OCGT plant will not form a visible plume. The exhaust temperature is such that water vapour in the flue gas is unlikely to condense close to the stack structure before dispersal, even during times of very low ambient temperature.

The stack structure will include a CEMS. Emissions from the stack will be monitored continuously using the CEMS and reported in accordance with the requirements for the operation of the Proposed Development under the Industrial Emissions (IE) Licence.

5.2.1.3 Selective Catalytic Reduction

The OCGT will be fitted with SCR technology that will reduce nitrogen oxides (NO_x) emissions from the OCGT to meet emission levels. The SCR system removes NO_x from flue gas emitted by the combustion process within the OCGT by injecting aqueous ammonia into the flue gas stream and passing it through a catalyst bed where the NO_x reacts with the ammonia to form nitrogen and water vapour (refer to drawing 60695232-TBT-DR-013).

In the OCGT plant, the flue gas will exit the turbine and pass through a SCR system before being released to the atmosphere via the 55m stack.

The hot exhaust gas, containing the products of combustion, excess air, and heat away from the gas turbine unit is routed via an exhaust system to the stack where it enters the SCR reactor. The exhaust gas streams pass over a metal catalyst (such as titanium oxide), which along with a reductant (aqueous ammonia), aids in the conversion of NO_x into nitrogen and oxygen. The percentage of NO_x reduction varies. Finally, the exhaust gas exits the reactor to the atmosphere.

5.2.1.4 Fin Fan Coolers

Two blocks of fin fan coolers will be positioned to the north-west of the OCGT. One block of fin fan coolers associated with the OCGT will have a length of 23m, a width of 6.4m and will be 6m in height, while the other for the lube oil will be 7m in length, 7.5m in width and 5m in height.

The fin fan coolers are necessary to provide cooling to the gas turbine oil and control oil systems, generators and transformers. The fin fan coolers circulate water in a closed loop, between these systems and the external radiators.

The coolers comprise variable speed fans that draw air over banks of finned tubes through which the hot water from the operational equipment is circulated. The finned tubes will be mounted horizontally and at a height above the ground to allow space for air to be drawn in from under the banks by the fans.

The speed of the fans varies to match the cooling requirements of the power generating equipment. This minimises the noise impact of the fans and reduces power load during operation. The location of the block of fin fan coolers, north-west of the OCGT, is shown on the following drawings (refer to EIAR Volume III), submitted with this application:

- 60695232-TBT-DR-001- Proposed Site Plan
- 60695232-TBT-DR-002C – Proposed site elevations (without flood wall) – A, B, C, D; and
- 60695232-TBT-DR-013 – Gas turbine unit, plan, section and elevations.

5.2.1.5 Main and Auxiliary Transformers

There will be one main and one auxiliary transformer separated by a firewall (20m in length x 0.6m in width and 15m in height). Power generated by the gas turbine generator will be exported to the switchgear infrastructure and conveyed in overhead cables of 75m in length to the existing 220Kv substation on the SSE Tarbert site (refer to drawing 60695232-TBT-DR-016).

5.2.1.6 Fire Suppression

The OCGT is installed in ventilated and acoustical insulated building. In the event of a fire or significant fuel build up in the OCGT building an inert gas purging system will be initiated to displace air.

An inert gas will be used for fire suppression. This will be stored in a bank of pressurised cylinders.

5.2.1.7 Services (inc. Electrical Cabling)

There will be service cables (fuel supply line and electrical cabling) associated with the Proposed Development both underground (culverts) and overground (pipe / cable racks).

There will also be existing services that are within the Proposed Development Site which will continue to remain in situ, and not be rerouted or removed. This includes the existing high voltage cabling that

runs north-south within the Proposed Development Site and along the southern boundary of the substation. There is currently a planning application submitted by EirGrid in the system for determination in relation to works to these cables (Planning Ref. 23350), refer to Table 4.2 in Chapter 4, EIAR Volume I for more details. The Proposed Development is not reliant upon the permission or development of the EirGrid application.

The majority of the new HVO pipeline will be above ground with a short section (approximately 22m) laid underground to connect to the OCGT. HVO will be forwarded from the storage tanks to the proposed OCGT via the fuel polishing and transfer system in pipework 190m in length.

Electricity cabling of 75m will be overhead between the transformer and the substation. Refer to drawing 60695232-TBT-DR-005 – Site services layout, for more details.

5.2.1.8 Fuel Supply

The Proposed Development will run on Hydrotreated Vegetable Oil (HVO), which is a biofuel that is produced by processing waste oils to create a fossil-free alternative to distillate-oil in accordance with European Union (EU) sustainability standards. HVO provides a transitional step away from fossil fuels and a move towards a more decarbonised power system by providing dispatchable capacity to support the variable nature of renewable energy generation. It has lower greenhouse gas emissions profile across its lifetime when compared to non-biogenic alternatives such as diesel or natural gas combustion (refer to EIAR Chapter 17, Volume I).

The Proposed Development supports an orderly transition to a low-carbon world whilst also tackling Ireland's security of electricity supply challenges.

SSE is committed to sourcing HVO that is third party Certified to Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources 'Renewable Energy Directive III (RED-II) under the International Sustainability and Carbon Certification (ISCC). HVO will be sourced from 100% waste feedstocks, the raw materials for which are grown on a seasonal basis so there is no long-term "carbon debt". Supplied HVO will comply with the RED II (Directive (EU) 2018/2001) which provides specific sustainability criteria and the carbon intensity of individual biofuels, including an assessment of the feedstocks used and the emissions from its production, processing and supply, and will be certified accordingly by a third party. There are a number of HVO suppliers in Ireland that are certified in line with ISCC and RED II, which provide HVO for various uses. The Applicant will source its HVO from any one or more of these suppliers.

There will be three HVO storage tanks to provide capacity for up to 84 operating hours (combined volume of up to 10,300m³). The HVO will be pumped through the fuel polishing system to ensure it is within the required specification for the generation units. This system passes the fuel through a series of filters to remove particulates and water before returning it to the tank. The separated water and particulates are stored in a separate small tank for off-site disposal as required.

5.2.2 HVO Pipework

HVO pipework (approximately 200m in length) will form part of the Proposed Development. The majority of this pipework will be underground in culverts, with only a short section (approximately 22m) being laid above ground, refer to drawing 60695232-TBT-DR-005.

5.2.3 Administration Building, Workshop, Stores and Car Parking

A new administration building with workshop and car parking is proposed to the west of the OCGT. This building will provide a combination of administration office space and workshops for the Proposed Development (40m x 13m x 5m high), refer to drawing 60695232-TBT-DR-009.

The new car parking provided to the front of the administration and workshop building will include eight parking spaces (100m²). This will be in addition to the existing car park to the north-east of the SSE Tarbert Site.

5.2.4 Flood Defence

Flood defence measures will be constructed in close proximity to the main OCGT unit and be incorporated into the OCGT building in parts. The infrastructure design will incorporate flood gates which can be opened and closed as required and will be managed by the site operational team. The flood defence measures will consist of concrete walls 7.54m ordnance datum Poolbeg (ODP) in height (approximately 1.5m in height above ground). Details of which are shown in Appendix 12A and Appendix 12B, EIAR Volume II and in drawings 60695232-TBT-DR-019 and 60695232-TBT-DR-020.

5.2.5 Water Supply

Mains water will produce demineralised water which will be injected into the gas turbine combustors for NO_x control. The water injected will be discharged in the exhaust gases through the stack. Demineralised water will be produced in an on-site Water Treatment Plant (WTP) (refer to drawing 60695232-TBT-DR-011). It is expected that in operation the Proposed Development will require up to 150m³ per hour of demineralised water.

Mains water will also be used for firefighting purposes. This will be supplied from a dedicated system supplied from a common firewater / water storage tank of approximately 5,900m³.

Water will be supplied to the Site via the existing mains connection which enters the on-site reservoir located to the east of the Tarbert HFO Power Station.

5.2.6 Wastewater Management

5.2.6.1 Surface Water Management

Surface water runoff will be generated from all hard surfaces within the Site which are exposed to rainwater or to which water is applied during wash down (process of cleaning a surface for appearance, sanitation, or removal of contamination which can require the use of detergents and other chemicals). This will include all hardstanding surfaces, roofs, and other impermeable surfaces.

The impermeable areas contributing to surface water drainage systems will include roofed, bunded and road / concrete areas. The surface water collected from the Site by means of the underground drainage

network will first be conveyed to a full retention oil separator and then to attenuation storage with a combination of 990m³ below ground with an additional 1410m³ above ground storage, required during the extreme storm events and variable sea levels coinciding. All either existing or proposed outfalls and drainage outlets require flap valves or flood gates to prevent backflow during extreme events. Refer to EIAR Volume II Appendix 12B for more details.

5.2.6.2 Foul Water Management

The drainage strategy has been developed with reference to current good practice and to provide separate foul and surface water drainage networks within the Site. A new wastewater treatment plant will be installed at the Site, to the north-west of the demineralisation water tanks (refer to Appendix 5C for more details).

The Proposed Development will not lead to an increase in staff and therefore there will be no additional foul water generated (either from sanitation or process water) and as a result there will be no requirement for increased foul water management at the Site over and above existing facilities.

5.2.6.3 Process Wastewaters

Production of demineralised water will result in process wastewater which will be discharged to the surface water drainage system. The wastewater will contain the naturally occurring minerals removed from the mains water. Wastewater will be treated to adjust the pH to neutral range before discharge to an existing discharge point which is located to the north of the Site and known as Outfall SE9. This discharge will be regulated under the IE Licence.

HVO contains low levels of impurities which are removed prior to use in the OCGT by means of a fuel polishing system. Waste generated by the fuel polishing system will be stored in a tank. The waste from the tank will contain hydrocarbons and will periodically be disposed offsite by road tanker in compliance with the Waste Management Act 1996 (as amended), and associated regulations.

The internal blading of the gas turbine accumulates deposits from the air over time which requires periodic washing. The frequency of washing is a function of operating hours and ambient air characteristics. The turbine is rotated slowly in a water and detergent solution. Wastewater generated from blade washing will be collected in a dedicated drain tank for disposal offsite by road tanker in compliance with the Waste Management Act 1996, and associated regulations for disposal.

5.2.7 Firefighting Systems and Controls

A comprehensive fire detection and firefighting system will be provided for the Proposed Development.

Heat, fire, and gas detection systems will be incorporated as appropriate to the fire risk. Where required, flame detection will also be installed.

Firefighting on-site in addition to the fixed suppression systems and other measures, will be carried out by manual fire suppression using a fire water hydrant network. A new fire water hydrant network will be installed for the protection of the equipment as required by the local fire authority. Fire safety evacuation drills and training to be provided as appropriate. National Fire Protection Association (NFPA) guidance will be followed as appropriate.

Portable extinguishers appropriate to the fire risk will be sited at readily accessible fire points throughout the Site.

Fire water discharges will be collected in the surface drainage system and will be tested before being discharged from the Site either after passing through the drainage interceptors or tankered off site depending upon the quality.

5.2.8 Chemical Storage

All chemicals and oils stored on the Proposed Development Site will be regulated under the IE licence. A number of chemicals and oils will be stored on-site, including;

- HVO.
- Lubrication Oils (for the gas turbine, gas compressor, pumps etc).
- Inert gas (e.g., CO₂) bottles (for fire suppression).
- Hydrogen Bottles (Generator Cooling).
- Propane gas as the start-up fuel.
- Aqueous ammonia.
- Compressor cleaning detergent; and
- General oils and greases for rotating machinery.

All chemicals and oils will be stored in suitably bunded areas (approximately 4980m³ in total) and with weather protection.

The chemical tanks specific to the demineralised Water Treatment Plant will be contained within a bund adjacent to the water treatment plant building.

All fuels and chemicals stored on-site will be subject to a COSHH (Control of Substances Hazardous to Health) assessment and compliance with the requirements of Regulation EC 1907/2006² Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH):

- all containers and bunds will be inspected regularly.
- accidental spillages will be contained and cleaned immediately.
- spill kit(s) will be stored and available on site; and
- all potentially polluting substances including waste will be stored in designated areas in appropriate containers within bunds, drip trays or spill pallets, as required.

All tanks containing liquids whose spillage could be harmful to the environment will be bunded. No tanks or pipework containing liquids such as fuel, oils or chemicals will be stored below ground.

² [EUR-Lex - 32006R1907 - EN - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu/eli/reg/2006/1907/oj)

5.2.9 External Lighting

External lighting (for operational phase) will provide safe working conditions in all areas of the Site whilst reducing light pollution and visual impact on the local environment. This will be achieved by the use of luminaries that eliminate the escape of light in directions not required.

Detailed lighting design is provided in drawing 60695232-TBT-DR-022 and Appendix 5B, EIAR Volume II.

5.2.10 Demolition Works

As part of the construction phase and site preparation, the works will include the demolition and removal of ancillary buildings/structures associated with the existing Tarbert HFO Power Station as follows (but not the Tarbert HFO Power Station building) refer to drawing 60695232-TBT-DR-004:

- Carpenters workshop (1200m³).
- Boiler ash and brickwork
- Water treatment plant (9500m³).
- Wastewater treatment plant
- Demin tank
- Fuel lines
- Contractor / Canteen building (3300m³).
- Boiler wash open top storage tank (5,500m³).
- Mechanical workshop
- Chemical storage bund(175m³).
- Shot blasting shed.
- Lube oil store (2800m³); and
- Site toilets (300m³).

Tarbert HFO Power Station is due to close by the end of 2023 as it selected the Limited Lifetime Derogation under the Industrial Emission Directive (IED). As the Tarbert HFO Power Station is an EPA licenced facility, a site closure and restoration/aftercare plan is required to be in place and be to the satisfaction of and agreed with the EPA. The site closure plan falls under the remit of the existing Tarbert HFO Power Station Industrial Emissions Licence (IEL).

Refer to Chapter 18 Waste Management, EIAR Volume I and Appendix 18A, EIAR Volume II for more details.

5.3 Construction Phase

5.3.1 Construction Phase and Construction Works

The Applicant will appoint Contractors for the main construction works and to undertake the specific construction works and civil works. The construction phase of the Proposed Development will comprise:

- Site clearance including demolition of some existing structures and services.
- Temporary construction and laydown areas (hardstanding), open storage areas, temporary facilities and plant storage areas.
- Construction compound including the staff offices and welfare facilities.
- Ground preparations and other civil works, e.g., foundations³, tanks, drainage etc.
- Mechanical and electrical works associated with new plant build.
- Temporary vehicle parking facilities.
- Security fencing/gates.
- Lighting and signage; and
- Commissioning and testing of plant.

The construction equipment required for these works will vary depending upon activity but will include cranes, generators, excavators, loaders, trucks, trailers, vans, piling rig etc.

Foundation construction will require piling, the piling technique assessed within this EIAR involves the use of a hydraulic hammer rig (refer to Chapter 11, EIAR Volume I for the assessment). The piling technique will involve a hydraulically accelerated piling hammer to drive load-bearing piles or assist pile driving to a depth of between 10 – 15m dependent upon the structural loading required of each proposed OCGT component. The precise size and configuration of piles will be finalised by an appointed contractor and will be within the parameters set out in this planning application.

5.3.1.1 Construction Environmental Management Plan (CEMP)

A CEMP has been prepared as part of this planning submission. The CEMP will be updated by the developer in consultation with the local authority to incorporate any requirements of the grant of planning permission and any other updates as appropriate. The CEMP is presented in Appendix 5A, EIAR Volume II.

The Contractor's CEMP will detail the Contractor's overall management and administration of the works. The CEMP will also include any commitments included within the statutory approvals. The CEMP will be a key construction contract document and the contractor will be obliged to implement it in full.

The CEMP will be treated as a live document throughout the lifecycle of the Proposed Development, requiring regular review and update as necessary within the parameters presented in the EIAR, unless otherwise agreed in consultation with the local authority.

³ Refer to EIAR Volume I Chapter 11 for more information.

5.3.1.2 Construction Schedule

The construction phase of the Proposed Development will be approximately 29 months. The appointed Contractor will indicate the duration of construction works in the Contractor's CEMP within the parameters assessed in the EIAR. The CEMP will be agreed with Kerry County Council (KCC) prior to construction commencing.

Table 5.1: Development Phases

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		
Activities	Mobilisation and Site Prep																														
			Demolition Works																												
							Construction Works																								
																									Fuelling and Commissioning						



5.3.1.3 Site Management - Construction Hours, Staffing, Access and Parking

Construction Hours

Construction phase works will take place between the hours of 0700hrs to 1900hrs (Monday to Friday) and 0800hrs to 1500hrs (Saturday). No works shall take place on Sundays or Bank Holidays.

Construction works outside these hours will only take place in exceptional circumstances (i.e., for specific engineering works e.g., concrete pours, commissioning and testing, etc.), and this will be agreed in advance with KCC. It is likely that some construction phase works, such as concrete pours will also be required to be for 24 hours, for limited durations. In these exceptional cases, requests may be made to KCC to seek permission for works to proceed outside the above times / days. Work conducted outside of core hours, will comply with any restrictions agreed with the planning authorities, in particular regarding the control of noise and traffic.

Staffing

Levels of employment will vary throughout the construction phase. The peak work force is expected to be up to 200 personnel per day estimated to be over an 11-month period during the construction programme, with varying degrees of personnel associated with the other 20 months of the programme including the site set up, mobilisation, demobilisation and commissioning (refer to EIAR Volume I, Chapter 14 for more details).

Staff will comprise engineering, management, skilled and semi-skilled workers during the 29-month construction programme. A number of indirect employment opportunities will be created in a variety of different trades as a result of the construction of the Proposed Development.

Site Access

The Proposed Development construction traffic will use both the existing main SSE Tarbert site gated entrances (northern entrance) to the Site and the southern access off the N67 Road.

It is anticipated that the extent of Heavy-Duty Vehicle (HDV) movements will vary throughout the construction phase works, in response to the specific construction activities taking place.

Months 12 to 22 will observe the highest number of staff vehicle arrivals on Site with a maximum of 200 staff on Site at once, this will equate to 133 staff light duty vehicles (LDVs) arriving to Site each day during the peak months based on a 1.5 car occupancy. HDV movements are expected to peak in Months 28 – 29 with a total of 22 HDV arrival each day. This results in peak construction trip generation of 278 total two-way vehicle trips per day.

Security

The Site of the Proposed Development will be separated from the Temporary Emergency Generation (TEG) plant area which is within the SSE Tarbert site but not within the Proposed Development Site (refer to EIAR Volume I, Chapter 1 for more details). The appointed Contractors will control all aspects of Proposed Development Site security in related to the Proposed Development.

The Proposed Development will be located within the confines of the existing SSE Tarbert site and will be securely fenced and monitored at all times by CCTV surveillance.

Parking

Employment levels will vary throughout the construction phase, and it is expected that peak staffing levels will occur from months 12 to 22, when 200 no. staff will be required, equating to 278 two-way Light Duty Vehicle (LDV) trips. Parking will be available on-site for construction staff vehicles and will be provided at one of the on-site construction compounds.

5.3.1.4 Construction Compounds

The proposed location of the construction compounds are shown within Appendix 5A, EIAR Volume II. The construction compounds will be secured with temporary fencing and will accommodate employee parking throughout the construction period and will include additional laydown facilities, staff welfare facilities and temporary services on the Site. Access to the construction compounds will be security controlled and all Site visitors will be required to sign in on arrival and sign out on departure.

The construction compounds will not be for long-term storage of materials, and storage but will be for the duration of the construction phase only. The existing Tarbert HFO Power Station building will be utilised for office space, storage and laydown where possible.

Lighting

A lighting arrangement will be provided to ensure a safe work environment for construction staff. Outdoor lighting will be minimised to that required to meet health and safety requirements. Lighting will consist of LED luminaires due to their sharp cut-off, lower intensity, good colour rendition and dimming capability. A warm white spectrum will be adopted to reduce blue light component. Light spill will be controlled by the use of luminaires.

5.3.1.5 Health and Safety (H&S)

The Applicant recognises and accepts its responsibilities for ensuring the health, safety and welfare of its employees, contractors, visitors, and members of the public who could be affected by its activities; it is committed to safety and always executes the highest safety standards, whilst also ensuring compliance with all applicable Irish health, safety and environmental laws and regulations.

A comprehensive Health & Safety programme will be implemented to minimise any risks to and ensure the health and safety of construction personnel, site visitors and any local residents.

The Applicant manages any environmental impacts or risks by applying and continually improving a Safety, Health and Environment (SHE) Management System. This SHE management system is accredited to international standard ISO 14001:2015 Environmental Management System

First aid facilities, for the use of all construction staff, will be provided in the form of a fully provisioned first aid area within the Site office with lifesaving and safety equipment as required by relevant statutes, authorities and awards will be maintained at all times by the Contractor.

The Proposed Development will comply with all H&S Regulations during the construction phase. Where possible, potential risks will be omitted from the design so that the impact on the construction phase will be reduced.

5.3.1.6 Construction Waste

During the construction phase, the Proposed Development will generate a range of non-hazardous and hazardous waste (e.g., oils and chemicals) materials. Waste materials will be required to be temporarily stored on-site pending collection by a waste contractor. The appointed Contractor will endeavour to ensure that material is reused or recovered offsite insofar as is reasonably practicable or disposed of at authorised facility.

The CEMP includes design and construction measures that apply the waste hierarchy principles and minimise effects on waste. These include:

- Planning for the temporary on-site storage of soils, excavated materials and other materials to facilitate reuse.
- Reusing excavated materials within the construction of the Proposed Development, where possible, to minimise the need to import and export material.
- Considering the importation to site of recycled aggregate material, as an alternative to primary aggregate, and establishing procedures to ensure it is uncontaminated.
- Establishing Key Performance Indicators (KPIs) for monitoring and reporting data on waste arising and diversion from landfill.

5.3.1.7 General Mitigation Measures

Works will be undertaken in accordance with the following environmental management technical guidance documents:

- CIRIA⁴ (2001). *Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532)*.
- CIRIA (2006). *Control of water pollution from linear construction projects. Technical guidance (C648)*.
- CIRIA (2016). *Environmental Good Practice on site pocketbook (C762)*.
- EPA (2021). *Best Practice Guidelines for The Preparation of Resource Management Plans for Construction & Demolition Projects*.

5.4 Operational (inc. Commissioning) Phase

5.4.1 Industrial Emissions (IE) Licence

The Proposed Development will comply with the requirements of the *EU (Large Combustion Plants) Regulations 2012, S.I. No. 566 of 2012*, under an Industrial Emissions (IE) Licence (to be applied for). Any emissions which have the potential to impact to air, soil, surface water and groundwater and human health, will be mitigated against and avoided where possible.

⁴ Construction Industry Research and Information Association

The SSE Tarbert Environment Management System (EMS) will be amended to include the Proposed Development. The EMS will set out the requirements and procedures required to ensure that the Proposed Development is operating to appropriate standards.

Environmental monitoring (including analysis of pollutants) will be carried out, where required, including monitoring of exhaust emissions levels using Continuous Emission Monitoring Systems (CEMS) prior to discharge from the flue gas emissions stack, in accordance with the IE Licence.

5.4.2 Start-Up and Shutdown

The Proposed Development will start-up and shutdown in response to the requirements of the electricity grid operator (EirGrid) request for power to the grid.

The Proposed Development is specifically designed to start-up, shutdown and change its output rapidly (350MW) in response to the requirements for power from the electricity grid.

5.4.3 Commissioning

The commissioning phase will be similar to the operational phase of the Proposed Development but may have a greater number of start-ups and shutdowns over the commissioning phase.

The hot commissioning phase takes place once fuel is available and connected to the OCGT Plant. Commissioning involves operating the OCGT Plant with fuel and verifying that the whole system functions correctly. Performance testing will be included at the end of this period to verify that the facility meets its contractual performance guarantees.

5.4.4 Operational Phase Staffing

During the operational phase, the Proposed Development will be operated, maintained and managed by up to 14 suitably qualified personnel.

There is likely to be a high degree of automation with the OCGT Plant, with processes controlled from the administration building.

5.4.5 Operational Phase Maintenance

Routine maintenance will be carried out in accordance with the maintenance procedures provided by the contractor and manufacturer. The Proposed Development will be required to undertake periodic inspections, as per the manufacturer's requirements. During this time the Proposed Development will be shut down to allow the inspection to be completed (by the manufacturer's personnel or other maintenance professionals).

These works will generally take place during the summer months, when demand for the Proposed Development is at its lowest. Generally, balance of plant maintenance is also undertaken in this period.

There is also the possibility of non-routine maintenance i.e., breakdowns. These will be dealt with in an efficient ad-hoc manner and are most likely to be of a similar or smaller scale than routine maintenance works.

5.4.6 Health and Safety - Emergency Planning

A site-specific Health and Safety (H&S) Plan will be included in the Contractor's CEMP prior to construction phase and will include commissioning procedures to ensure compliance with relevant health and safety legislation.

Measures to prevent the risk of fires, spillages, floods, and other major incidents are embedded in the design of the Proposed Development.

Measures to prevent potentially major incidents include:

- Hazardous and polluting liquids such as transformer oils will be stored in tanks located in bunds.
- HVO fuel unloading bay will be designed to contain spillages.
- Storage tank level indicators and oil detection sensors in bunds will be provided with alarms.
- Class 1 full retention Oil Water Separator will be provided in the surface water drainage system.
- Measures to isolate the surface water drainage system will be provided to prevent discharge of contaminated water.

The Applicant will ensure that operating, maintenance, and emergency response procedures and manuals will be subject to regular review and will be updated to reflect best industry practice, or to reflect the addition of new procedures, equipment or other facilities.

Operational procedures will be in place that will clearly outline responsibilities and the appropriate communication channels for operational staff / site personnel. Operational phase employees will receive the appropriate training required for their role, including responding to emergency events such as fires and floods etc. These operational measures will be included in the EMS and regulated by EPA through the IE Licence.

5.4.7 Operational Traffic and Transport

Full details on operational phase traffic movements are detailed in EIAR Chapter 14 (Traffic and Transport).

During the operational phase of the Proposed Development, the Site will generate approximately 38 arrival trips per day and is considered to not have any major impact on the surrounding road network.

During the operational phase, the OCGT will run only on HVO. HVO will be delivered to the Site by HDV road tankers. During the operational phase, there will be limited vehicle movements associated with the supply of HVO for the Proposed Development, owing to the fact the Proposed Development will only be used during periods when other sources of electricity generation are unable to meet demand.

In an emergency situation when other sources of electricity generation are unable to meet demand, there may be the requirement for HDV fuel deliveries (vehicle movements from one source) with up to 18 HDV arrivals on-site per day for the emergency running period, followed by 21 delivery days of 18 HDV arrivals on-site per day for replenishment of the fuel stock (refer to Chapter 14, EIAR Volume I for more details). However, this is not expected to be a regular occurrence. Fuel delivery will be limited to

the hours between 0700 and 1900, and no deliveries will take place on Sundays or at night, except in the case of extended emergency operations.

5.5 Decommissioning Phase

It is expected that the Proposed Development will have a design life of at least 25 years after commissioning. After 25 years in operation, the Proposed Development will either be upgraded to extend its operational life or it may be decommissioned, depending on the national grid requirement. A decision on whether to extend the operational lifetime or to decommission the Proposed Development will be expected to be made before the equipment reaches 25 operational years.

Where decommissioning takes place, all above-ground components associated with the Proposed Development will be disassembled and removed from the Site. However, prior to the removal of plant, all residues and operating chemicals will be cleaned out from the plant and disposed of at a suitably licenced facility. The majority of the equipment will have some limited residual value as scrap or recyclable materials and will be recycled at the time.

Contamination prevention is a requirement of the IE Licence during the operational phase. Therefore, the Proposed Development has been designed to prevent new areas of ground contamination or pathways to receptors as a result of construction or operation. Once the plant and equipment have been removed to ground level the hardstanding and sealed concrete areas will be left in place.

The decommissioning process will consider the potential environmental risks at the Site and provide guidance and appropriate mitigation procedures in agreement with the EPA, to minimise risk.

During the decommissioning phase there will be the need for a Site office and staff facilities to be located on-site. The decommissioning will include an outline programme of works and ensure that decommissioning phase activities will be conducted in accordance with the appropriate guidance and legislation.

5.6 References

Construction Industry Research and Information Association (CIRIA) (2001). Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532).

Construction Industry Research and Information Association (CIRIA) (2006). Control of water pollution from linear construction projects. Technical guidance (C648).

Construction Industry Research and Information Association (CIRIA) (2016). Environmental Good Practice on site pocketbook (C762).

Environmental Protection Agency (EPA) (2021). Best Practice Guidelines for The Preparation of Resource Management Plans for Construction & Demolition Projects.

Environmental Protection Agency (EPA) (2022). Guidelines on the Information to be contained in Environmental Impacts Assessment Reports.

SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 06 Consultations

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November 2023

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Table of Contents

6.	Consultations	6-1
6.1	Introduction	6-1
6.2	Strategic Infrastructure Development Pre-Application Consultation	6-1
6.3	References	6-5

Appendices (EIAR Volume II)

Appendix 6A: Pre Application Submission

Appendix 6B: Pre Application Response

Appendix 6C: Tarbert Next Generation Power Station Banners

Appendix 6D: Tarbert Next Generation Power Station Newsletter

Appendix 6E: Tarbert Next Generation Power Station Newspaper Advertisements and Media Coverage

Appendix 6F: Tarbert Next Generation Power Station Public Consultation

Appendix 6G: Tarbert Next Generation Power Station Feedback Form

6. Consultations

6.1 Introduction

This chapter details of the consultation undertaken prior to submission of the planning application and Environmental Impact Assessment Report ('EIAR') in relation to the Proposed Development.

Consultation with relevant statutory and non-statutory bodies forms an important part of the EIA process. The 2022 EPA Guidelines '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*' confirms that '*Consultation is a key element of each stage of the EIA process*'. *The requirement for consultation is included in the definition of EIA in the Directive and there are procedures for statutory consultation at various stages in the EIA process*¹.

6.2 Strategic Infrastructure Development Pre-Application Consultation

The Strategic Infrastructure Development ('SID') provisions in the Planning and Development Act 2000 (hereby known as "the Act" in this document), as amended, have been adhered to in making this application with a formal Pre-Application Consultation (refer to Appendix 6A, EIAR Volume II) carried out between the Applicant and An Bord Pleanála ('ABP') prior to the finalisation and submission of this application (Reference 316229-23).

A pre-application consultation request was submitted to ABP on the 11 of April 2023 to commence pre-application consultation and the request provided an overview of the Proposed Development including:

- The Proposed Development's heat output will be 300MW or more. As the Proposed Development comprises an industrial installation for carrying gas, steam or hot water with a potential heat output of 300MW or more, it constitutes 'Seventh Schedule' development under the Act (as amended).
- It is considered that Proposed Development constitutes SID under the terms of Section 37A(2)(a) of the Act as it is of strategic economic importance to the State and the region in which it is situated.
- Furthermore, with reference to Section 37A(2)(b) of the Act, it was highlighted that the Proposed Development - by helping to maintain security of supply and facilitating the integration of more renewable generation into the electricity network - would contribute significantly to the fulfilment of national and regional objectives to deliver a "secure and reliable electricity network".

Following the submission of the request, a meeting was held with the representatives from the Applicant, their consultants and ABP on the 28 of August 2023. The meeting record is included in Appendix 6B (refer to EIAR Volume II).

¹ EPA (2022). *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*.

During this meeting a presentation was delivered to ABP representatives addressing the need for the Proposed Development, the planning history of the Proposed Development Site, alternatives considered and the issues pertaining to the development in terms of planning policy and potential environmental impacts, as well as the Applicant's opinion as to the SID status of the Proposed Development (i.e., that it does constitute SID).

The main points discussed during the meeting included:

- Introduction to the project;
- Site Details;
- Project Background;
- Proposed Development;
- Planning Context;
- EIAR and AA; and.
- Stakeholder Engagement

The Board concluded (refer to Appendix 6B, EIAR Volume III), on the 16 October 2023, that under Section 37B(4)(a), the Board was of the opinion that the Proposed Development is within the scope of paragraphs 37A(2)(a) and (b) of the Act:

“Accordingly, the Board has decided that the proposed development would be strategic infrastructure within the meaning of section 37A of the Planning and Development Act 2000, as amended. Any application for permission for the proposed development must, therefore, be made directly to An Bord Pleanála under section 37E of the Act”.

In addition, an information sharing session was held with officials from Kerry County Council (KCC), AECOM (Environmental team), Gravis Planning and SSE on 03 July 2023. The briefing outlined an overview of the Proposed Development and project programme.

6.2.1 Public Consultation

6.2.1.1 Consultation Methods

Details of the consultation methods are presented in the SSE Community Consultation Report, refer to EIAR Volume II Appendix 6F.

6.2.1.2 Community Consultation Events

An SSE Thermal led public consultation was held between 10 July and 02 August 2023 to provide members of the public with information on the Proposed Development in advance of the submission of the planning application and enabled them to express their own ideas, allowing them to take an active role in developing the proposals through providing feedback.

Prior to the launch of the public consultation, the dedicated Community Liaison Officer for the project went door-to-door on 28 April 2023 to households in close proximity to the existing Tarbert Power HFO Station in addition to the town of Tarbert to introduce himself and highlight the forthcoming consultation related to the Proposed Development, alongside providing an update on the TEG project.

On the week commencing 03 July 2023 a newsletter was circulated to households in close proximity to the existing Tarbert HFO Power Station, the town of Tarbert and the surrounding area which provided

an overview of the Proposed Development alongside advertising in-person and online consultation activities. A copy of the newsletter was provided to local political stakeholders in advance of its circulation. Also, on the week commencing 03 July a press release providing an overview of the Proposed Development and consultation activities was issued to local media publications either side of the Kerry-Limerick border. In addition to the aforementioned press release issued on week commencing 03 July, paid advertising was taken out with The Kerryman, Kerry's Eye and The Weekly Observer newspapers on week commencing 10 July to further promote in-person and online consultation activities. The public consultation took the form an online virtual consultation room and in-person staffed exhibitions. Both the online virtual consultation room and in-person events presented plans and project information for the Proposed Development on 'roll-up' banners. The virtual consultation room was launched on 10 July, while in-person events were held on 18 and 19 July 2023 as follows:

- Tarbert Community Centre (1730 – 2100hrs on 18 July 2023),
- Listowel Arms Hotel (1730 – 2100hrs on 19 July 2023).

Details on the Proposed Development presented online and at the in-person events related to:

- An overview of the Proposed Development
- Site Location
- Hydrotreated Vegetable Oil (HVO) fuel and it's benefits
- Overview of how an Open Cycle Gas Turbine Works
- Key Local Issues
- Just Transition
- Next Steps for the Proposed Development
- Other SSE Developments in the wider Tarbert area

Key members of the project team from SSE, Gravis Planning and AECOM were present to assist attendees, talk through the proposals and respond to questions or issues raised. Attendees included members of the local community, elected representatives, local employees and those with an interest in the surrounding environment. Feedback Forms were available to enable those who attended the events to express their viewpoints about different aspects of the Proposed Development. The Feedback Forms included the contact details of the Community Liaison Officer to enable individuals to send further comments if desired. A Feedback Form mechanism was also provided for the online virtual consultation room.

The virtual consultation room closed on 02 August, marking the end of the SSE Thermal led community consultation.

6.2.2 SID Statutory Consultation and Public Notices

In accordance with the requirements of ABP and Article 214 of the Planning and Development Regulations 2001- 2023 and section 37E(3) of the Planning and Development Act 2000 (as amended,) the applicant has notified the public of this application by means of:

- **Site Notices:** Site notices have been erected on the relevant lands. The location of these notices are shown on the submitted planning application drawings. A copy of the notice is included in the planning application pack.
- **Newspaper Notices:** Newspaper notices have been published in two newspapers in circulation in the area. A copy of the newspaper notice is included in the application pack.

In addition, an application website (www.ssetarbertnextgen.com) has been set up, which is referenced in the public notices and contains a full set of the submitted application documents for ease of inspection by members of the public.

6.2.3 Planning Application Stage

As noted above, the planning application is made under Section 37E of the Act (as amended).

The planning application is accompanied by a Planning Statement, an EIAR and an Appropriate Assessment (AA) Screening and Natura Impact Statement (NIS).

The Proposed Development planning application documents will be available electronically to interested parties on the EIA Portal, and on ABP application website.

6.3 References

Department of Housing, Planning and Local Government (DHPLG) (2018). Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.

Environmental Protection Agency (EPA) (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.

European Commission (EC) (2013). Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment.

European Commission (EC) (2015). Interpretation of definitions of project categories of Annex I and II of the EIA Directive.

European Commission (EC) (2017a). Environmental Impact Assessment of Projects - Guidance on EIA Scoping.

European Commission (EC) (2017b). Environmental Impact Assessment of Projects, Guidance on the preparation of Environmental Impact Assessment Reports.

European Union (EU) (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 298 of 2018).

SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I

Chapter 07 Air Quality

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November 2023

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Table of Contents

7.	Air Quality	7-1
7.1	Introduction	7-1
7.2	Legislation and Policy	7-2
7.3	Methodology	7-5
7.4	Baseline Environment.....	7-28
7.5	Potential Impacts	7-31
7.7	Cumulative Impacts	7-45
7.8	Summary	7-57
7.9	References	7-58

Plates

Plate 7.1:	Windrose plots for Shannon Airport 2017-2021.....	7-17
Plate 7.2:	Modelled Buildings within ADMS (facing West).....	7-19
Plate 7.3:	Annual Mean NO ₂ Contribution by Stack Height	7-30

Tables

Table 7.1:	Air Quality Standards and Environmental Assessment Levels	7-3
Table 7.2:	Example Definitions of the Magnitude of Construction/ Demolition Activities	7-8
Table 7.3:	Receptor Sensitivity to Construction/ Demolition Dust.....	7-9
Table 7.4:	Sensitivity of the Area to Dust Soiling on People/ Property	7-9
Table 7.5:	Sensitivity of the Area to Human Health.....	7-10
Table 7.6:	Classification of Risk of Unmitigated Impacts	7-10
Table 7.7:	ADMS 6 Model Source Input Data	7-12
Table 7.8:	Cumulative Sources ADMS 6 Model Source Input Data	7-13
Table 7.9:	Modelled Ecological Receptors	7-15
Table 7.10:	Modelled Human Health Receptors	7-16
Table 7.11:	Building Dimensions	7-19
Table 7.12:	Description of Dust Impacts and Effects	7-22
Table 7.13:	The description of impacts referred to in the IAQM Guidance.	7-25
Table 7.14:	EPA Zone D Background Concentrations and Deposition Rate ^a	7-28
Table 7.15:	Dust Emission Magnitude of Construction/ Demolition Activities for the Proposed Development	7-31
Table 7.16:	Risk of Impacts from Unmitigated Activities from the Proposed Development	7-32
Table 7.17:	Modelled Annual-Mean NO ₂ Emissions at Human Health Receptor Locations – Proposed Development	7-33
Table 7.18:	Modelled 99.79 th Percentile 1-Hour Mean NO ₂ Emissions at Human Health Receptor Locations – Proposed Development	7-34
Table 7.19:	Modelled 99.18 th Percentile 24-Hour Mean SO ₂ Emissions at Human Health Receptor Locations – Proposed Development	7-35
Table 7.20:	Modelled 99.73 rd Percentile 1-Hour Maximum SO ₂ Emissions at Human Health Receptor Locations – Proposed Development	7-36
Table 7.21:	Modelled Maximum 8-Hour Mean CO Emissions at Human Health Receptor Locations – Proposed Development.....	7-37
Table 7.22:	Modelled Annual Mean PM ₁₀ Emissions at Human Health Receptor Locations – Proposed Development	7-38
Table 7.23:	Modelled 90.41 st Percentile 24-Hour Mean PM ₁₀ Emissions at Human Health Receptor Locations – Proposed Development	7-39

Table 7.24: Modelled Annual Mean PM _{2.5} Emissions at Human Health Receptor Locations – Proposed Development	7-40
Table 7.25: Modelled Annual Mean NO _x Emissions at Ecological Receptor Locations – Proposed Development	7-41
Table 7.26: Modelled Annual Mean SO ₂ Emissions at Ecological Receptor Locations – Proposed Development	7-42
Table 7.27: Modelled Annual Nitrogen Deposition at Ecological Receptor Locations – Proposed Development	7-43
Table 7.28: Modelled Annual Acid Deposition at Ecological Receptor Locations – Proposed Development	7-44
Table 7.29: Modelled Annual-Mean NO ₂ Emissions at Human Health Receptor Locations –Cumulative Developments	7-45
Table 7.30: Modelled 99.79 th Percentile 1-Hour Mean NO ₂ Emissions at Human Health Receptor Locations –Cumulative Developments.....	7-46
Table 7.31: Modelled 99.18 th Percentile 24-Hour Mean SO ₂ Emissions at Human Health Receptor Locations – Cumulative Developments.....	7-47
Table 7.32: Modelled 99.73 rd Percentile 1-Hour Maximum SO ₂ Emissions at Human Health Receptor Locations – Cumulative Developments.....	7-48
Table 7.33: Modelled Maximum 8-Hour Mean CO Emissions at Human Health Receptor Locations – Cumulative Developments	7-49
Table 7.34: Modelled Annual Mean PM ₁₀ Emissions at Human Health Receptor Locations – Cumulative Developments	7-50
Table 7.35: Modelled 90.41 st Percentile 24-Hour Mean PM ₁₀ Emissions at Human Health Receptor Locations – Cumulative Developments.....	7-51
Table 7.36: Modelled Annual Mean PM _{2.5} Emissions at Human Health Receptor Locations – Cumulative Developments	7-52
Table 7.37: Modelled Annual Mean NO _x Emissions at Ecological Receptor Locations –Cumulative Developments	7-53
Table 7.38: Modelled Annual Mean SO ₂ Emissions at Ecological Receptor Locations –Cumulative Developments	7-54
Table 7.39: Modelled Annual Nitrogen Deposition at Ecological Receptor Locations –Cumulative Developments	7-55
Table 7.40: Modelled Annual Acid Deposition at Ecological Receptor Locations – Cumulative Developments	7-56

Appendix (Refer to EIAR Volume II)

No Appendices

Figures (Refer to EIAR Volume III)

Figure 7.1: Modelled sources from SSE Tarbert Site

Figure 7.2: Modelled sources from SSE Tarbert Site and Cumulative Developments.

Figure 7.3: Modelled ecological receptors.

Figure 7.4: Modelled human receptors.

Figure 7.5: Annual Mean NO₂ (µg/m³) PC - Proposed Development Scenario.

Figure 7.6: 99.79thile 1-hour NO₂ (µg/m³) PC - Proposed Development Scenario.

Figure 7.7: 99.18thile 24-hour SO₂ (µg/m³) PC - Proposed Development Scenario.

Figure 7.8: 99.73rdile 1-hour SO₂ (µg/m³) PC - Proposed Development Scenario.

Figure 7.9: Maximum 8-hour rolling mean CO (µg/m³) PC - Proposed Development Scenario.

Figure 7.10: Annual Mean PM₁₀ (µg/m³) PC - Proposed Development Scenario.

Figure 7.11: 90.41stile 24-hour PM₁₀ (µg/m³) PC - Proposed Development Scenario.

Figure 7.12: Annual Mean SO₂ (µg/m³) PC - Proposed Development Scenario.

7. Air Quality

7.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) assesses the impact of the Proposed Development on local air quality. Impacts on air quality can affect human receptors through harm to health and amenity, and nature conservation receptors through harm to vegetation and habitat.

The Site of the Proposed Development (herein referred to as “the Site”) is located within the boundary of the existing SSE Tarbert site, Tarbert, Co. Kerry.

This chapter provides a description of the relevant legislation and policy framework, assessment methodology, baseline conditions at the Proposed Development and its surroundings, an estimate of the anticipated air emissions associated with each of the phases of the Proposed Development, the mitigation measures required to prevent, reduce, or offset any likely significant effects, and the likely residual effects after these methods have been employed.

Full details on the background and Site history are provided in Chapter 4 (Existing Site) and details of the Proposed Development are presented in Chapter 5 (Description of the Proposed Development) and the Planning Statement submitted with this planning application.

7.1.1 Scope of Assessment

The construction, operational and decommissioning phases of the Proposed Development are covered by this assessment. The air quality impacts arising from these are summarised as follows:

- Construction Phase:
 - Emissions of dust and particulates from construction activity; and
 - Emissions of oxides of nitrogen (NO_x) (including nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}) from construction phase traffic movements.
- Operational Phase:
 - Combustion emissions associated with combustion sources for generating power, including NO_x (including NO₂), PM₁₀ and PM_{2.5}, carbon monoxide (CO), ammonia (NH₃) and sulphur dioxide (SO₂); and
 - Emissions of NO₂ and particulate matter PM₁₀ and PM_{2.5} from operational phase traffic movements from transport of Hydrotreated Vegetable Oil (HVO) fuel.

During the decommissioning phase, potential air quality impacts will be very similar to impacts referred to under the construction phase. It is considered that impact and subsequent effect identified for construction in this assessment can also be used to represent potential impacts and effects during the decommissioning phase. As such, the impact and effect of decommissioning on local air quality is not considered further in this chapter.

7.2 Legislation and Policy

7.2.1 National Air Quality Standards

The *National Air Quality Standards*¹ were transposed from the following EU legislation:

- European Union (EU) air quality legislation is provided within Directive 2008/50/EC (Clean Air for Europe (CAFE)), which came into force on 11 June 2008. This Directive consolidated previous legislation which was designed to deal with specific pollutants in a consistent manner and provided new air quality objectives for particulate matter with an aerodynamic diameter of less than 2.5µm (PM_{2.5}). The consolidated Directives include:
 - Directive 99/30/EC - the First Air Quality 'Daughter' Directive - sets ambient Air Quality Limit Values (AQLVs) for NO₂, oxides of nitrogen (NO_x), sulphur dioxide, lead and particulate matter with an aerodynamic diameter of less than 10µm (PM₁₀);
 - Directive 2000/69/EC - the Second Air Quality 'Daughter' Directive - sets ambient AQLVs for benzene and carbon monoxide; and
 - Directive 2002/3/EC - the Third Air Quality 'Daughter' Directive - seeks to establish long term objectives, target values, an alert threshold and an information threshold for concentrations of ozone in ambient air.
- The fourth daughter Directive was not included within the consolidation and is described as Directive 2004/107/EC. This sets health-based limits on polycyclic aromatic hydrocarbons, cadmium, arsenic, nickel and mercury, for which there is a requirement to reduce exposure to as low as reasonably achievable.
- Directive 2008/50/EC has been implemented through the *Air Quality Standards Regulations 2011*¹. These regulations set out upper and lower assessment thresholds for the pollutants of concern. The Air Quality Standards include thresholds to encourage a higher standard of air quality where possible.

The EU Limit Values and National Air Quality Standards that are of relevance to this assessment are presented in Table 7.1 In addition to the Limit Values and Air Quality Standards, Table 7.1 provides relevant Environmental Assessment Levels and averaging periods for other pollutants, as referred to within Environmental Protection Agency (EPA) guidance (AG4)². These, which are commonly associated with industrial emissions, are not covered by the EU Directives detailed, but are considered potentially harmful to the environment and human health if present at concentrations exceeding the Environmental Assessment Levels listed.

Table 7.1 also provides Critical Loads for nutrient nitrogen and acid (nitrogen and sulphur), set by the Convention on Long-Range Transboundary Air Pollution, as presented on the Air Pollution Information

¹ Government of Ireland (2011). *Air Quality Standards Regulations 2011, S.I. No. 180 of 2011*.

² EPA (2020). *Dispersion Modelling from Industrial Installations Guidance Note (AG4)*.

System (APIS)³, for habitats that may potentially be affected by emissions associated with the Proposed Development.

Table 7.1: Air Quality Standards and Environmental Assessment Levels

Pollutant	Averaging Period	Irish Air Quality Standard / EU Limit Value / Environmental Assessment Level	Allowable Exceedance
Irish Air Quality Standard / EU Limit Value			
Nitrogen dioxide (NO ₂)	Annual mean	40 µg/m ³	No exceedances allowed
	Hourly mean	200 µg/m ³	18 allowable exceedances (99.79 th percentile of hours/year)
Particulate matter (PM ₁₀)	Annual mean	40 µg/m ³	No exceedances allowed
	Daily mean	50 µg/m ³	35 allowable exceedances (90.41 st percentile of days/year)
Fine particulate matter (PM _{2.5})	Annual mean	20 µg/m ³	No exceedances allowed
Carbon monoxide (CO)	Rolling 8-hour maximum	10,000 µg/m ³	No exceedances allowed
Sulphur dioxide (SO ₂)	Daily mean	125 µg/m ³	3 allowable exceedances (99.18 th percentile of days/year)
	Hourly mean	350 µg/m ³	24 allowable exceedances (99.73 rd percentile of hours/year)
Oxides of nitrogen (NO _x) – for the protection of ecosystems	Annual mean	30 µg/m ³	No exceedances allowed
Sulphur dioxide (SO ₂) – for the protection of ecosystems	Annual mean/winter mean	20 µg/m ³	No exceedances allowed
Convention on Long-Range Transboundary Air Pollution Critical Loads			
Nutrient nitrogen deposition	Annual	Habitat relevant Critical Loads	No exceedances allowed
Acid Deposition	Annual	Habitat specific Critical Loads	No exceedances allowed

7.2.2 Industrial Emissions Directive

The installed aggregated thermal capacity of the Proposed Development will exceed 50MW. As such, its operations will fall within the remit of the EU's Industrial Emissions Directive (2010/75/EU). The

³ APIS (2016). *Hosted & Maintained by UK Centre for Ecology and Hydrology. www.apis.ac.uk*

primary aims of the Industrial Emissions Directive are to prevent or reduce pollution from industrial activities, to reduce waste and to promote energy efficiency. The Directive applies to all large industrial installations and to power plants which are above a certain size threshold. The Directive will apply to the applicable combustion plant associated with the Proposed Development.

The EPA is the statutory body responsible for issuing and enforcing Industrial Emissions Licences (IELs). The operator will be required to obtain an IEL from the EPA for the proposed Open Cycle Gas Turbine (OCGT) power plant; this is expected to be through a licence modification. Licences are determined having regard to the principle of Best Available Techniques (BAT), which, in turn, is based on the Best Available Techniques Reference Documents ("BREF" documents, available at: <https://eippcb.jrc.ec.europa.eu/reference>) developed and published by the European Commission. The EU has prepared a series of reference documents for different industrial activities, which define BAT for each activity.

7.2.3 Relevant Environmental Legislation

Other national legislation that relates to air quality and are of relevance to this assessment are listed as follows:

- European Union (Environmental Impact Assessment) (Environmental Protection Agency Act 1992) (Amendment) Regulations 2020 - S.I. No. 191 of 2020.
- European Communities (Birds and Natural Habitats) (Amendment) Regulations 2021 - S.I. No. 293 of 2021.
- European Union (Industrial Emissions) Regulations 2013 - S.I. No. 138 of 2013.
- Environmental Protection Agency (Industrial Emissions) (Licensing) Regulations 2013 - S.I. No. 137 of 2013; and
- European Communities (Birds and Natural Habitats) Regulations 2011.

7.2.4 National Planning Policy

7.2.4.1 Project Ireland 2040

Project Ireland 2040 is the Government's long-term overarching strategy for future development and infrastructure in Ireland. It consists of several documents, including the *National Planning Framework* (NPF)⁴, which is the Government's high-level strategic plan for shaping the future growth and development of Ireland up to 2040.

The NPF includes the following overarching aim that is relevant to this assessment:

'Creating a Clean Environment for a Healthy Society:

...Promoting Cleaner Air: Addressing air quality problems in urban and rural areas through better planning and design.'

⁴ Government of Ireland (2018). *National Planning Framework*.

The NPF includes National Policy Objective 64, which stresses the importance of improving ambient air quality:

'National Policy Objective 64: Improve air quality and help prevent people being exposed to unacceptable levels of pollution in our urban and rural areas through integrated land use and spatial planning that supports public transport, walking and cycling as more favourable modes of transport to the private car, the promotion of energy efficient buildings and homes, heating systems with zero local emissions, green infrastructure planning and innovative design solutions.'

Project Ireland 2040 also includes the Government's National Development Plan (NDP) 2021-2030⁵. This document is focused on Ireland's long-term economic, environmental, and social progress up to 2030, and references improvements in air quality as an additional benefit to improving energy efficiency for the primary purpose of reducing carbon emissions.

The air quality assessment described in this chapter will demonstrate whether or not the emissions associated with the Proposed Development contravene the relevant aims and objectives of Project Ireland 2040.

7.2.5 Local Planning Policy

The Proposed Development is located within Co. Kerry; therefore, they are the planning authority. Accordingly, the Kerry County Development Plan (Kerry CDP)⁶ takes precedence when considering how air quality impacts the planning decision, however a review of neighbouring county's development plans (Limerick and Clare) was undertaken in order to identify any potential constraints, none were identified. The Kerry CPD sets out the following objectives with regards to local air quality:

- **Objective AQ1:** Protect local air quality from emissions that are harmful to human health and the local environment.
- **Objective HH1:** Protect the public from threats to health and wellbeing across the functions of relevance to the Kerry CDP.

7.3 Methodology

7.3.1 Construction Dust Assessment

The movement and handling of soils and spoil during construction activities for the Proposed Development is anticipated to lead to the generation of some short-term airborne dust. The occurrence and significance of dust generated is difficult to estimate and depends heavily upon the nature of the activity being carried out and the meteorological and ground conditions at the actual time and location of the work.

⁵ Government of Ireland (2021). *National Development Plan 2021-2030*.

⁶ Kerry County Council (2022) Kerry County Development Plan 2022-2028 Volume 5
<http://docstore.kerrycoco.ie/KCCWebsite/planning/devplan/vol5updatednew.pdf>

At present, there are no statutory standards relating to the assessment or control of dust. The emphasis of the regulation and control of construction dust, therefore, is through the adoption of good practice when working on site to mitigate any potential impacts. It is intended that significant adverse environmental effects are avoided at the design stage and through embedded mitigation where possible, including the use of good working practices to control dust emissions at source.

The Institute of Air Quality Management (IAQM) provides professional guidance for good practice and a framework of approaches for qualitative assessment of risk of dust emissions from construction and demolition activities⁷. The guidance considers the risk of dust emissions from unmitigated activities to cause human health impacts (associated with PM₁₀), dust soiling impacts, and ecological impacts (such as physical smothering, and chemical impacts for example from deposition of alkaline materials). The appraisal of risk is based on the scale and nature of activities and on the sensitivity of receptors, and the outcome of the appraisal is used to determine the level of good practice mitigation required for adequate control of dust.

The assessment undertaken for the Proposed Development is consistent with the overarching approach to the assessment of the impacts of construction, and the application of example descriptors of impact and risk set out in IAQM guidance. It considers the risk of potential impacts occurring with good practice measures and embedded mitigation in place and if necessary, recommends additional mitigation measures appropriate to the identified risks to receptors. The steps in the assessment are to:

- identify receptors within the appropriate study area for the Site;
- identify the potential magnitude of emissions through consideration of the scale, duration and location of activities being carried out;
- establish the sensitivity of the area through determination of the sensitivity of receptors and their distance from construction activities;
- determine the risk of dust emissions causing significant effects on receptors as a result of the potential magnitude of emissions and the sensitivity of the area, assuming no additional mitigation (beyond the identified development design and impact avoidance measures) is applied.
- confirm the appropriateness of embedded good practice measures based on the level of risk, to reduce likely effects at receptors so it is not significant, and determine additional measures to mitigate the specific impacts, if necessary, and;
- summarise the potential residual effects of the mitigated works.

The following four activities involved in the construction phase of the Proposed Development have the potential to impact on local air quality, based on the nature of construction activities proposed:

- demolition (buildings and structures);
- earthworks (soil stripping, spoil movement and stockpiling);

⁷ IAQM (2014) *IAQM Guidance on the assessment of dust from demolition and construction*, Institute of Air Quality Management, London, Updated 2016, <https://iaqm.co.uk/text/guidance/construction-dust-2014.pdf>

- construction; and
- trackout Heavy Duty Vehicle (HDV) movements on unpaved roads and offsite mud on the highway).

7.3.1.1 Receptor Identification

Screening criteria from the IAQM to determine whether a construction dust assessment is required includes determining whether receptors are present. The screening criteria for human receptors which is generally used in industry, based on professional guidance from the IAQM, is 350m from the boundary of the Site or 50m from the construction traffic route up to 500m from the Site. These distances are conservative whereby beyond this distance a negligible mass of material will persist.

The screening criteria for ecological receptors cited in the IAQM guidance is 50m from the boundary of the site or 50m from the construction traffic route up to 500m from the site. This smaller distance relative to human receptors is used as the larger dust particles which affect ecological receptors are less likely to travel beyond this distance.

There are several residential sites within 350m of the Site boundary, as shown in Figure 7.4, in addition the River Shannon and River Fergus Estuaries Special Protection Area (SPA) is within 50m of the Site boundary and the Lower River Shannon Special Area of Conservation (SAC) is just beyond that distance from the Site boundary. It is noted though that both ecological receptors are tidal and are regularly submerged by the tide. The effect of dust emissions on these ecological sites are not therefore considered further in this assessment.

7.3.1.2 Magnitude Definitions

The categorisation detailed in the IAQM guidance⁷ for the potential magnitude of construction activities to generate dust emissions is provided in Table 7.2. This categorisation has been used in the assessment carried out.

Table 7.2: Example Definitions of the Magnitude of Construction/ Demolition Activities

Magnitude	Demolition	Earthworks	Construction	Trackout
Large	Total building volume >50,000m ³ , potentially dust construction material (e.g., concrete), on-site crushing and screening, demolition activities >20m above ground level	Site area >1ha potentially dusty soil type (e.g., clay). >10 heavy earth moving vehicles at once, bunds >8m high, total material moved >100,000 tonnes	Total building volume >100,000 m ³ , on-site concrete batching, sandblasting	>50 Heavy Duty Vehicles (HDV) peak outward movements per day, potentially dusty surface material (e.g., high clay content), unpaved road length >100m
Medium	Total building volume 20,000 – 50,000m ³ , potentially dusty construction material, demolition activities 10 to 20 m above ground level	Site area 0.25 – 1 ha, moderately dusty soil type (e.g., silt), 5 – 10 heavy earth moving vehicles at once, bunds 4-8m high, total material moved 20,000 – 100,000 tonnes	Total building volume 25,000 – 100,000m ³ , potentially dusty materials e.g., concrete, on-site concrete batching	10 – 50 HDV peak outward movements per day, moderately dusty surface material (e.g., high clay content), unpaved road length 50 – 100m
Small	Total building volume <20,000m ³ , construction material with low potential for dust release (e.g., metal cladding or timber), demolition activities <10m above ground level, demolition during wetter months	Site area <0.25ha, large grain soil type (e.g., sand), <5 heavy earth moving vehicles at once, bunds <4 m high, total material moved <20,000 tonnes	Total building volume <25,000m ³ , low dust potential construction materials. E.g., metal/timber	<10 HDV peak outward movements per day, surface material low dust potential, unpaved road length <50m

7.3.1.3 Receptor Sensitivity Definitions

The assessment of the significance of the effects of construction dust has been made with respect to the receptor and area sensitivity definitions as outlined in Table 7.3: to Table 7.5. Sensitivity definitions have been made with reference to the IAQM guidance.

Table 7.3: Receptor Sensitivity to Construction/ Demolition Dust

Sensitivity	Human Perception of Dust Soiling	Human Health with respect to PM ₁₀
High sensitivity	Enjoy a high level of amenity; appearance/ aesthetics/ value of property would be diminished by soiling; receptor expected to be present continuously	Public present for 8 hours per day or more, e.g., residential, schools, care homes and hospitals/healthcare centres
Moderate sensitivity	Enjoy a reasonable level of amenity; appearance/ aesthetics/ value of property could be diminished by soiling; receptor not expected to be present continuously	Only workforce present (no residential or high sensitivity receptors) 8- hours per day or more
Low sensitivity	Enjoyment of amenity not reasonably expected; appearance/ aesthetics/ value of property not diminished by soiling; receptors are transient / present for limited period of time, e.g., playing fields, farmland, footpaths, short term car parks (depending on parking duration)	Transient human exposure, e.g., footpaths, playing fields and parks.

Distances have been measured from source to receptor in bands of less than 20m, less than 50m, less than 100m and less than 350m for earthworks and construction. For track out, the receptor distances have been measured from receptor to track out route (up to 50m) and up to 500m from the construction site exit. These distance bands have been applied in Table 7.4 and Table 7.5.

Table 7.4: Sensitivity of the Area to Dust Soiling on People/ Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	≥1	High	High	Medium	Low
Moderate	≥1	Medium	Low	Low	Low
Low	≥1	Low	Low	Low	Low

Table 7.5: Sensitivity of the Area to Human Health

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High (annual mean PM ₁₀ concentration <24 µg/m ³)	≥1	Medium	Low	Low	Low
Medium (annual mean PM ₁₀ concentration <24 µg/m ³)	≥1	Low	Low	Low	Low
Low	≥1	Low	Low	Low	Low

7.3.1.4 Risk Definitions

The potential risks from emissions from unmitigated construction activities have been defined with reference to the magnitude of the potential emission and the highest sensitivity receptor(s) within the area, as summarised in Table 7.6.

Table 7.6: Classification of Risk of Unmitigated Impacts

Area Sensitivity to Activity	Magnitude		
	Large	Medium	Small
Demolition			
High	High risk	Medium risk	Medium risk
Medium	High risk	Medium risk	Low risk
Low	Medium risk	Low risk	Negligible
Earthworks			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible
Construction			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible
Trackout			
High	High risk	Medium risk	Low risk
Medium	Medium risk	Low risk	Negligible
Low	Low risk	Low risk	Negligible

7.3.1.5 Construction Dust Assessment Methodology Summary

To summarise, the methodology for determining the risk of unmitigated impacts considers impacts on dust soiling and on human health. The steps used in doing so for dust soiling are as follows:

- Define the potential dust emission magnitude (Table 7.2)
- Define the sensitivity of the area (Table 7.4), this needs to take account of:
 - Receptor sensitivity (Table 7.3:),
 - Receptor distance; and
 - Classification of risk due to unmitigated impacts (Table 7.6).

The steps taken in determining human health are as follows:

- Define the potential dust emission magnitude (Table 7.2)
- Define the sensitivity of the area (Table 7.5), this needs to take account of:
 - Receptor sensitivity (Table 7.5),
 - Receptor distance; and
 - Classification of risk due to unmitigated impacts (Table 7.6).

7.3.2 Construction and Operational Traffic Assessment

Transport Infrastructure Ireland (TII) technical guidance document PE-ENV-01106⁸ sets out criteria whereby a detailed assessment can be screened out as unlikely to affect air quality. The guidance is used extensively in Ireland for this purpose. These criteria are:

- Road alignment will change by 5m or more; or
- Annual average daily traffic (AADT) flows will change by 1,000 or more; or
- Heavy duty vehicle (HDV) (vehicles greater than 3.5 tonnes, including buses and coaches) flow will change by 200 AADT or more; or
- Daily average speed change by 10kph or more; or
- Peak hour speed will change by 20kph or more.

As shown in Chapter 14 of this EIAR, traffic flows during the construction phase of development are anticipated increase by a maximum of 278 per day for LDVs and 44 per day for HDVs.

During operation, traffic flows are anticipated to increase by a maximum of 40 for LDVs (staff travel) and 36 HDVs (HVO delivery) per day.

These changes in traffic during either the construction or operation phase are well below the relevant assessment criteria and the fact that these will access the Proposed Development along the existing

⁸ TII (2022) Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Development [PE-ENV-01106 \(tiipublications.ie\)](https://www.tiipublications.ie/PE-ENV-01106)

public road network, no significant change in air quality is likely from traffic during the construction or decommissioning phases. Therefore, consideration of vehicle effects has been screened out of this assessment.

7.3.3 Operational Phase Emissions Assessment

The assessment of operational phase emissions has made use of the current version of the Atmospheric Dispersion Modelling System ADMS 6 (version 6.0), published by Cambridge Environmental Research Consultants (CERC). ADMS 6 is software approved for use by the EPA² and has been subject to successful validation studies undertaken by CERC and other entities independent from CERC. The general model parameters are discussed in detail in the following sections.

In this assessment two scenarios are modelled, the first scenario assesses the potential impact from sources from the Proposed Development, which is limited to the proposed OCGT, at the proposed 1800 hours of operation annually, operating at 100% load. Pollutants emissions included in the assessment are NO_x, CO, SO_x, particulates and NH₃ slip due to SCR abatement. This scenario is referred to as the Proposed Development Scenario.

The second scenario is the Cumulative Developments Scenario includes all of the proposed OCGT, the generators which form the Tarbert Temporary Emergency Generation (TEG) Site operational for 500 hours per year each and sources from Moneypoint Power Station.

7.3.3.1 Source Emissions Data – Proposed Development Scenario

Representative source characteristics and emissions data has been obtained for an F-class gas turbine unit from the project engineer, optimised for use with HVO. This information has been scrutinised and data relevant to the dispersion modelling assessment extracted and used as model input data, as listed Table 7.7 and in Figure 7.1 (refer to EIAR Volume III).

Table 7.7: ADMS 6 Model Source Input Data

Source Parameters	OCGT Generator
Stack location X	107535
Stack location Y	149578
Release heights (m)	55
Stack diameter (m)	9
Exit Velocity (m/s)	34.88
Exhaust Mass Flow (kg/s)	1237
Temperature (°C)	350
Exhaust Volume Flow (Nm ³ /h)	2,607,082
NO _x Emission conc. (mg/Nm ³)	50
CO Emission conc. (mg/Nm ³)	100

Source Parameters	OCGT Generator
PM ₁₀ Emission conc. (mg/Nm ³)	10
SO ₂ Emission conc. (mg/Nm ³)	5
NH ₃ Emission conc. (mg/Nm ³)	10
Emission rate (g/s NO _x)	36.3
Emission rate (g/s CO)	72.6
Emission rate (g/s PM ₁₀)	7.3
Emission rate (g/s SO ₂)	3.63
Emission rate (g/s NH ₃)	6

¹Stack locations are in Irish National Grid

7.3.3.2 Source Emissions Data - Cumulative Developments Scenario

In addition to the Proposed Development sources, cumulative sources from the surrounding areas have also been modelled. The cumulative sources included within this assessment are TEG, Moneypoint Power Station and the sources outlined as part of the Proposed Development Scenario. Source characteristics and emissions data has been obtained from licences and stack emissions monitoring reports. Information provided has included proposed stack emissions monitoring reports. This information has been scrutinised and data relevant to the dispersion modelling assessment extracted and used as model input data, as listed in Table 7.8 and in Figure 7.2 (refer to EIAR Volume III).

Table 7.8: Cumulative Sources ADMS 6 Model Source Input Data

Source Parameters	TEG Unit 1	TEG Unit 2	TEG Unit 3	Moneypoint A1-1	Moneypoint A1-3	Moneypoint Aux. Boiler
Stack location X	107145	107118	107090	103503	103637	103549
Stack location Y	149454	149466	149479	151696	151646	151802
Release heights (m)	30	30	30	220	220	3
Stack diameter (m)	4	4.0	4.0	6.89	6.89	0.45
Exit Velocity (m/s)	23.0	23.0	23.0	28.94	14.47	11.8
Exhaust Mass Flow (kg/s)	138.1	138.1	138.1	-	-	-
Temperature (°C)	451.6	451.6	451.6	72	72	200
Exhaust Volume Flow (Nm ³ /h)	392,636	392,636	392,636	2,400,000	1,200,000	3,488

Source Parameters	TEG Unit 1	TEG Unit 2	TEG Unit 3	Moneypoint A1-1	Moneypoint A1-3	Moneypoint Aux. Boiler
NO _x Emission conc. (mg/Nm ³)	90	90	90	200	200	350
CO Emission conc. (mg/Nm ³)	100	100	100	-	-	-
PM ₁₀ Emission conc. (mg/Nm ³)	17	17	17	-	-	-
SO ₂ Emission conc. (mg/Nm ³)	66	66	66	200	200	350
Emission rate (g/s NO _x)	9.8	9.8	9.8	133.33	66.67	0.34
Emission rate (g/s CO)	10.9	10.9	10.9	-	-	-
Emission rate (g/s PM ₁₀)	1.9	1.9	1.9	-	-	-
Emission rate (g/s SO ₂)	7.2	7.2	7.2	133.33	66.67	0.34

¹Stack locations are in Irish National Grid

7.3.3.3 Model Receptors

The model predicts the contribution of emissions of NO_x and SO₂ to annual mean concentrations at the discrete ecological receptors listed in Table 7.9 and Figure 7.3 (refer to EIAR Volume III). Within 15km of the Proposed Development, a total of 15 sensitive nature conservation site receptors have been selected to adequately represent various habitats across the Special Areas of Conservation (SAC) areas and sections of the Special Protection Area (SPA), including various habitats within the River Shannon and River Fergus Estuaries SPA.

Sensitive habits inside SACs and SPAs were identified by the AECOM ecologists. The ecologists selected coordinates that would be representative of the specific sensitive habitats inside the SAC and SPA areas which are sensitive to air quality. Receptor points were modelled at air quality sensitive habitats (e.g., coastal saltmarsh, salt meadows, and Salicornia) at the closest point to the Proposed Development. Ecological receptors have been modelled at a height of 0m above the ground.

Table 7.9: Modelled Ecological Receptors

Receptor ID	X	Y	Receptor Description	Habitat
E1a	107195	149405	River Shannon and River Fergus Estuaries SPA	Intertidal
E1b	107557	149217	River Shannon and River Fergus Estuaries SPA	Intertidal
E1c	107669	149668	River Shannon and River Fergus Estuaries SPA	Intertidal
E2a	107596	147662	Lower River Shannon SAC	Coastal Saltmarsh
E2b	107596	147662	Lower River Shannon SAC	Atlantic Salt Meadows
E2c	107596	147662	Lower River Shannon SAC	Molina meadows on calcareous, peaty or clayey-silt-laden soils
E2d	92652	153760	Lower River Shannon SAC	Salicornia and other annuals colonising mud and sand
E2e	108960	152912	Lower River Shannon SAC	Mediterranean Salt Meadows
E2f	107382	149078	Lower River Shannon SAC	Estuaries
E2g	97505	152660	Lower River Shannon SAC	Coastal Lagoons
E2h	99734	150585	Lower River Shannon SAC	Large Shallow Inlets and Bays
E2i	102360	152365	Lower River Shannon SAC	Perennial Vegetation of Stony Banks
E2j	110440	136312	Lower River Shannon SAC	Broadleaved deciduous woodland
E3	1111777	1440066	Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA	Bog
E4	104582	135652	Moanveanlagh Bog SAC	Bog

The model also predicts the contribution of emissions of the following pollutants to concentrations at discrete human health receptors:

- Annual and 1-hour mean NO₂ concentrations.
- 1-hour and 24-hour mean SO₂ concentrations.
- Rolling 8-hour mean CO concentrations.
- Annual and 24-hour mean PM₁₀ concentrations.
- Annual mean PM_{2.5} concentrations.

Within 15km of the Proposed Development, a total of 15 human health receptors have been selected to represent the potential impacts across this area, shown in Table 7.10 and Figure 7.4 (refer to EIAR

Volume III). These receptors are all residential properties. All human health receptors have been modelled at height of 1.5m above the ground.

The human health receptors were selected to represent worst-case exposure at locations where there is relevant sensitivity and represent other receptors in their vicinity. For example, in a cluster of houses, only one discrete receptor point has been modelled. The human health points were places on the closest point of a property to the Proposed Development (e.g., on the façade of a residential property).

Table 7.10: Modelled Human Health Receptors

Receptor ID	X	Y	Receptor Description
R1	107422	149253	Residential Property
R2	107461	149255	Residential Property
R3	107524	149283	Residential Property
R4	107669	149264	Residential Property
R5	107219	148479	Residential Property
R6	106804	147938	Residential Property
R7	107171	147741	Residential Property
R8	108525	147540	Residential Property
R9	109259	147679	Residential Property
R10	110044	150178	Residential Property
R11	109576	150532	Residential Property
R12	107565	152788	Residential Property
R13	105946	152181	Residential Property
R14	104522	151779	Residential Property
R15	104206	148150	Residential Property

7.3.3.4 Meteorological Data

Hourly sequential wind speed, wind direction, precipitation, temperature, and relative humidity data has been sourced from the meteorological station at Shannon Airport, to inform the dispersion modelling. Shannon Airport is also located along the Shannon Estuary, approximately 30km north-east of the Site. Shannon Airport was selected as the closest site where all the necessary meteorological parameters are available and the meteorological conditions there are considered to be suitably representative of the Site. For air quality modelling, the EPA's AG4 guidance² recommends using five years of meteorological data from an appropriate meteorological site, where the most recent year is compiled within the last 10 years of the assessment date. Windrose plots, produced from the meteorological data used in this assessment, are presented for Shannon Airport 2017– 2021 in Plate 7.1.

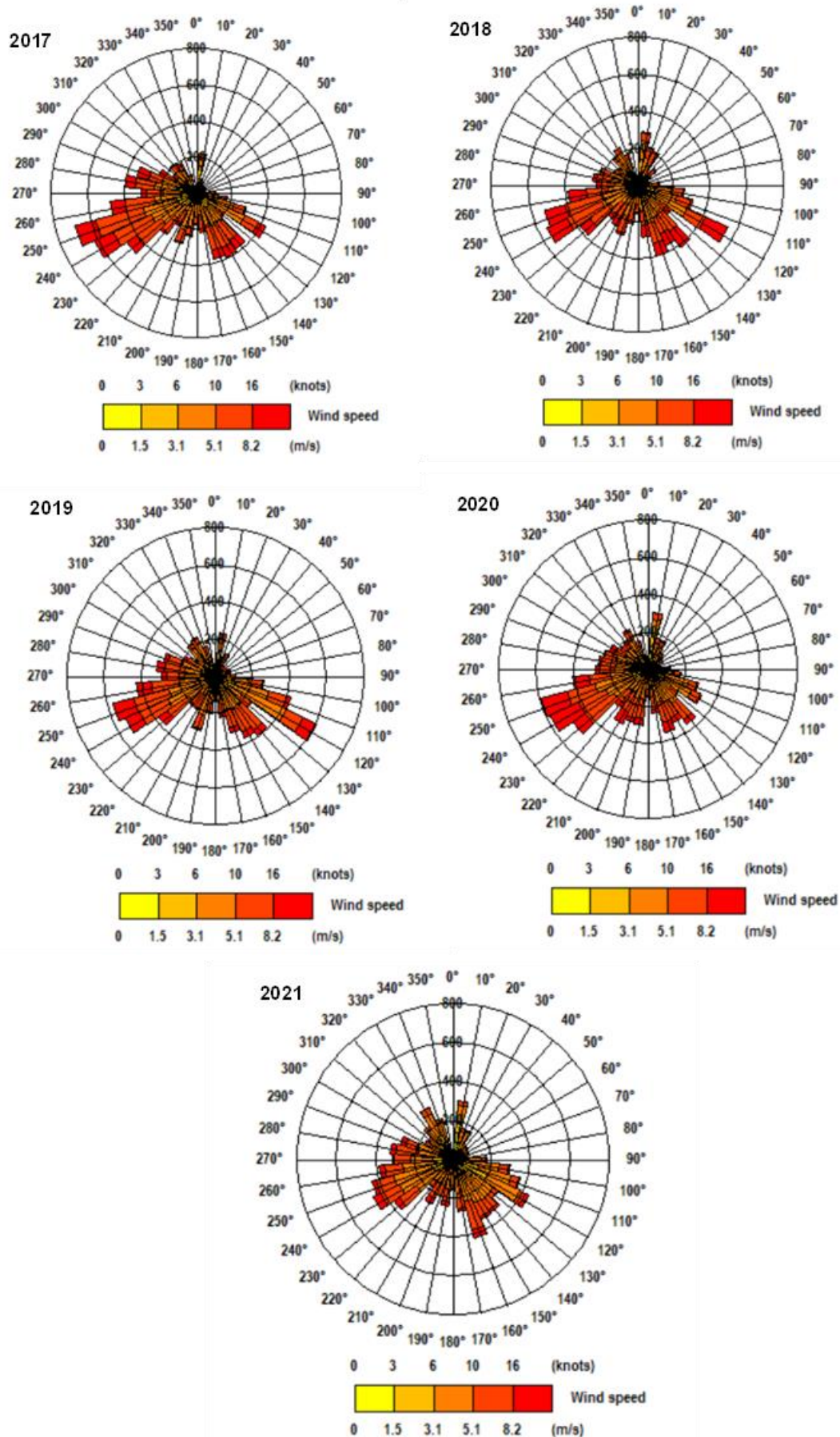


Plate 7.1: Windrose plots for Shannon Airport 2017-2021

The windrose plots show that the most common direction from which wind occurs is south-east, however, there are a range of speeds occurring from all directions and it is conceivable that the worst impacts could occur in any direction relative to the Site depending on meteorological conditions during any randomly occurring event.

Five years of meteorological data are used in the assessment which allows consideration of inter-annual variation. The contribution of emissions to pollutant concentrations and deposition rates reported at each receptor location is the worst-case value calculated at that location over the five years modelled.

In terms of how the dispersion model utilises the meteorological data, the latitude of the study area was set at 53°, the surface roughness of the study area set at 0.3m, to account for the fact that the study area is a combination of the estuary waterbody and swathes of open countryside with limited urban areas. The minimum Monin-Obukhov length set at 10m, to represent small towns and rural areas. For the meteorological site, the surface roughness was set at 0.2m to represent a typical meteorological site, which should be distanced well away from nearby buildings and structures.

7.3.3.5 Modelled Buildings and Structures

The buildings and structures around the Site that make up the existing SSE Tarbert buildings have the potential to affect the dispersion of emissions from the exhaust stacks. The ADMS 6 buildings effect module has therefore been used to incorporate building downwash effects as part of the modelling procedure. Building effects are typically considered where a structure of height greater than 40% of the stack height is situated within eight to ten stack heights of the emissions source. Modelled buildings are shown in Plate 7.2. The layout takes account of structures which will be in built and demolished as part of the Proposed Development. Therefore, represents the site layout as the Proposed Development will operate.

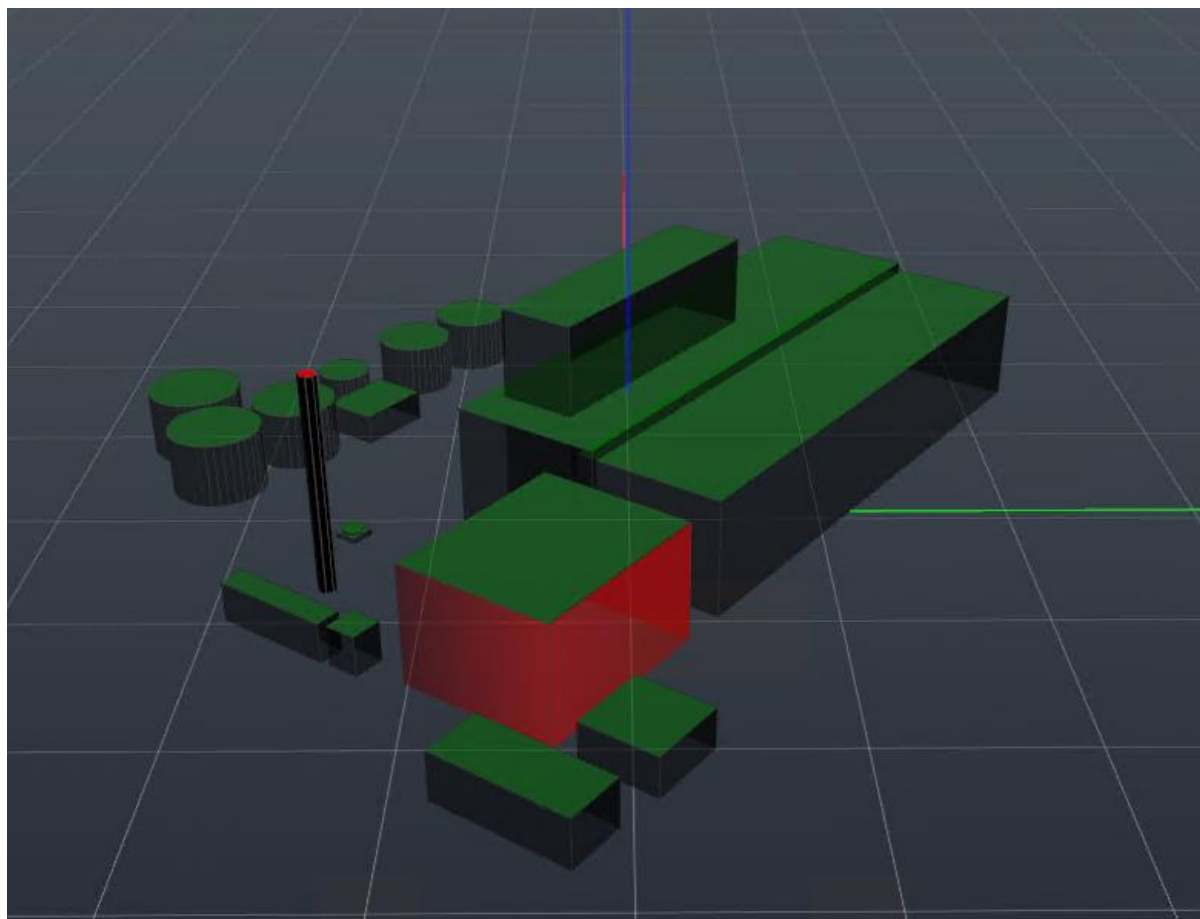


Plate 7.2: Modelled Buildings within ADMS (facing West)

Note: Looking east, the OCGT stack is shown with the red dot on top and the main building (as modelled within ADMS) in the model is shaded in red.

The dimensions of the structures that have been modelled as buildings within ADMS are provided in Table 7.11.

Table 7.11: Building Dimensions

Building	X	Y	Z (m)	Length (m)	Width (m)	Shape
Gas Turbine Building	107505	149526	30	40	50	Rectangular
Generator Fin-Fan Cooler	107516	149586	10	30	7	Rectangular
Admin Building & Workshop	107452	149529	12	35	15	Rectangular
Store	107471	149505	10	20	20	Rectangular
Fuel Polishing System	107624	149578	8	15	20	Rectangular
Ammonia Storage Bund	107561	149576	2	6	6	Rectangular
Denim Water Tank 1	107588	149614	17	24	24	Circular
Denim Water Tank 2	107612	149624	17	24	24	Circular

Building	X	Y	Z (m)	Length (m)	Width (m)	Shape
Day Storage Fuel Tank	107639	149588	10	14	14	Circular
Bulk Fuel Tank 1	107654	149569	14	20	20	Circular
Bulk Fuel Tank 2	107672	149555	14	20	20	Circular
Raw/Fire Water Tank	107608	149597	16	22	22	Circular
Lube Oil Fin Fan Cooler	107505	149568	10	8	8	Rectangular
Existing Power Station 1	107595	149460	30	40	150	Rectangular
Existing Power Station 2	107594	149508	56	20	73	Rectangular
Existing Power Station 3	107613	149488	33	40	150	Rectangular
Ammonia Storage Tank	107561	149576	3	5	5	Circular

7.3.3.6 Terrain Data

Terrain data was sourced from the U.S. Geological Survey, which provides data with a 50m resolution. ADMS 6 is limited to 66,000 terrain points in a model run. Using terrain data with a resolution of 50m, it could not be used to cover the full 15km area that was required for this assessment. Therefore, the terrain data was processed to provide a variable resolution of 50m for the majority of the study area and 200m resolution of the rest of the study area. This allowed for the consideration of terrain over a wider area whilst maintaining a suitable resolution for dispersion modelling. The lower resolution terrain begins ~10km to the south of the Designated Development. The 50m resolution terrain data south-western extent of the terrain data is at ING 91438, 140678 and the 200m resolution terrain data south-western extent of the terrain data is at ING 91382, 134741. The total terrain extends 25km to the west and 20km to the north from the south-western point of the 200m resolution terrain data.

The lowest point of the terrain data is 4m below sea level and occurs 10km west of the Proposed Development, however the Shannon Estuary does not have height data and has been assumed as zero. It is likely that this height data for this would be lower than this. The highest point of the terrain data is 251m above sea level and occurs 17km south-west.

7.3.3.7 Pollutant Conversions

NO_x to NO₂

To quantify annual mean NO₂, it was assumed that 100% of NO_x emissions released from the stack are converted to NO₂ in the atmosphere. This represents a precautionary approach in that in reality, this conversion is ozone-limited and not all NO_x emissions will be converted.

Nitrogen deposition was calculated from annual mean NO_x concentrations.

To quantify 1-hour NO₂, it was assumed that 50% of NO_x emissions released from the stack are converted to NO₂ in the atmosphere.

Nitrogen and Acid Deposition

Annual mean NO₂ and NH₃ concentrations are converted to N deposition using the methodology set out in EPA's AG4 guidance². Nitrogen deposition flux (as µg/m²/s) is calculated by applying a deposition velocity factor of 0.0015m/s to the annual mean NO₂ contribution as (µg/m³) and 0.020m/s to the annual mean NH₃ contribution as (µg/m³) at habitats with short vegetation (non-woodland) and a deposition velocity factor of 0.003m/s and 0.030m/s to annual mean NO₂ and NH₃, respectively, as (µg/m³) contribution at habitats with tall vegetation (woodland). Deposition rate (as kgN/ha/yr) for each are then calculated by applying a unit conversion factor of 95.9 to the NO₂ contribution and 260 for the NH₃ contribution before being summed to calculate total deposition flux (as µg/m²/s). These values can then be compared to a site relevant critical load determined using the APIS database³.

The deposition flux for each of these contributors to nitrogen acidification is converted to keq/ha/yr using a conversion factor of 6.84 for NO₂ and 18.5 for NH₃. The sulphur derived acidification is calculated from annual mean SO₂ (as µg/m³), firstly by applying a deposition velocity of 0.012m/s for non-woodland and 0.024m/s for woodland to derive a deposition flux as (µg/m²/s), this is then converted to keq/ha/yr using a conversion factor of 9.84. As outlined in AG4, the APIS critical load database and critical load function tool⁹ can then be used to determine the impacts.

7.3.4 Describing Significant Effects

The EPA EIAR Guidelines¹⁰ does contain a method to determine and describe the effect of a proposed development, but that approach is not wholly appropriate for air quality. This is because the relationship between magnitude of change in air quality conditions and receptor sensitivity is not linear. Receptor sensitivity to air quality impacts does not have a graded scale and instead, receptors are considered either sensitive to air quality impacts or not sensitive. Furthermore, the impact description of a change in pollutant concentration is not based on the magnitude of change alone, but that change relative to the pollutant concentration experienced at a receptor once the Proposed Development is in operation. The reason for this is to take account that smaller changes in air quality conditions can constitute a greater level of impact than a large change in conditions, where they occur at receptors that are predicted to experience pollutant concentrations close to or in excess of an Air Quality Standard or Environmental Assessment Level.

The EPA AG4 guidance document on dispersion modelling² does not include the specific means by which to describe the significance of effect on local air quality as a result of new emissions, with regards to determining the suitability of a development from a planning perspective. It does, however, provide criteria that Environmental Licence applicants should aim to achieve in terms of the maximum allowable air quality impacts from an Environmental Licencing perspective.

UK Environment Agency guidance¹¹ and IAQM and EPUK guidance¹² has been developed to determine whether or not an air quality effect can be screened as insignificant or not by the regulator, or significant or not by the planning authority, respectively. The approach described in these documents have been

⁹ APIS (2023). Critical Load Function Tool. <https://www.apis.ac.uk/critical-load-function-tool>

¹⁰ EPA (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports.

¹¹ UK EA (2016). Air Emissions Risk Assessment for your Environmental Permit Guidance – Updated 2022.

¹² IAQM & EPUK (2017). Land-Use Planning & Development Control: Planning for Air Quality.

considered and utilised alongside the EPA AG4 guidance² in this assessment. Where possible, the approaches described in the air quality specific guidance have been reported in a manner that is compatible with the requirements of the EPA Guidelines¹⁰, more detail on this is provided in the sections which follow.

7.3.4.1 Construction Phase Dust and Particulate Matter Assessment

For amenity effects from dust and particulates associated with construction activities, the aim is to bring forward a scheme, including additional mitigation measures where necessary, that will control impacts so that they give rise to negligible or minor effects (at worst) at the closest sensitive receptors. Determination of whether an effect is likely to be significant or not is based on professional judgement (from experience of similar projects) in the context of appropriate professional guidance (IAQM, 2014⁷), taking account of whether effects are permanent or temporary, direct or indirect, constant or intermittent and whether any secondary effects are caused (in this instance, secondary effects refer to dust that is generated and deposited (primary impact) and then re-suspended and deposited again by further activity).

The classification of amenity impacts (from dust soiling) and health effects on receptors exposed to impacts has been assessed using the relationship between the magnitudes of effects identified, in combination with receptor sensitivity and other related factors where appropriate (as described in the relevant guidance⁸, which results in a classification of effects as defined in Table 7.12.

Table 7.12: Description of Dust Impacts and Effects

Magnitude of Effect ¹	Change in dust deposition and short term PM ₁₀ Concentrations	Significance of Effects
High	Dust impact is likely to be intolerable for any more than a very brief period of time and is very likely to cause complaints from local people. Increase in PM ₁₀ concentrations at a location where concentrations are already elevated and to the extent that the short term PM ₁₀ air quality objective is likely to be exceeded.	Significant to Profound: A significant Impact that is likely to be a material consideration in its own right.
Medium	Dust impact is likely to cause annoyance and might cause complaints but can be tolerated if prior warning and explanation has been given. Increase in PM ₁₀ concentrations at a location where concentrations are already elevated and to the extent that the short term PM ₁₀ air quality objective is at risk of being exceeded.	Moderate: A significant effect that may be a material consideration in combination with other significant impacts but is unlikely to be a material consideration in its own right.
Slight	Dust impact may be perceptible, but of a magnitude or frequency that is unlikely to cause annoyance to a reasonable person or to cause complaints. Limited increase in PM ₁₀ concentrations.	Not significant to Slight: An impact that is not significant but that may be of local concern.
Negligible	Dust impact is unlikely to be noticed by and/ or have an effect on sensitive receptors. Negligible increase in PM ₁₀ concentrations.	Imperceptible: An impact that is not significant.

Magnitude of Effect¹ **Change in dust deposition and short term PM₁₀ Concentrations**

Significance of Effects

Notes: ¹ Terminology adapted to align with EPA Guidelines¹⁰

7.3.4.2 Operational Phase Emissions

EPA AG4 Approach

The EPA's *Guidance Note (AG4)*² does not specifically provide a criterion for determining significance of any effect from the predicted air quality impacts. It does, however, in its section on model accuracy and sensitivity studies, state that *"the process contribution (PC) should be less than 75% of the ambient air quality standard and less than this where background levels account for a significant fraction of the ambient air quality standard based on the formula"*:

- Maximum Allowable PC = $0.75 \times (\text{AQS})$ where there is no significant background concentration; or
- Maximum Allowable PC = $0.75 \times (\text{AQS} - \text{BC})$ where there is a significant background concentration

In this text provided by the EPA, PC refers to the process contribution of modelled emissions only. Air Quality Standard (AQS) refers the relevant concentration outlined in Section 7.2.1 of this document, though will be referred to as Environmental Assessment Level (EAL) hereafter. Background Concentration (BC) refers to the concentration of pollutant already present in the receiving environment. The term Predicted Environmental Concentration (PEC) is used throughout this document and is calculated as the sum of PC and BC, it therefore refers to the total concentrations at receptors.

UK Environment Agency (UK EA) Permitting Approach

The UK EA guidance¹¹ and IAQM and EPUK¹² Guidance provide an alternative and more precautionary approach to determining whether the impact of a proposed development has an effect that is potentially significant or not. Although, it should be noted that the UK Guidance is intended for use in areas of the UK where pollutant concentrations are often elevated close to or above the EAL. For application in rural Ireland, it can be considered a conservative means of determining potential significance. It should also be noted that the IAQM guidance is predominantly for urban development projects where road traffic emissions are often the biggest contributor to air quality impacts, rather than industrial installations, although there is no reason why the significance criteria described within it cannot be adopted for industrial sites.

According to the UK EA Guidance¹¹, an impact on human health sensitive receptors may be considered insignificant where:

- The short-term Process Contribution (PC - impact) is $\leq 10\%$ of the EAL; and
- The long-term Process Contribution (impact) is $\leq 1\%$ of the EAL.

Where an impact on human health sensitive receptors cannot be screened out at this stage, additional criteria is provided, including consideration of the Predicted Environmental Concentration (PEC – total

pollutant concentration), where the PC is added to the background (or ambient) concentrations. The impact may be considered insignificant where:

- The short-term PC is <20% of the EAL and
- The long-term PEC is <70% of the EAL.

Where an impact on human health sensitive receptors still cannot be screened as insignificant at this stage, it does not necessarily mean that the effect is now significant. At this stage, model inputs are reviewed, and detail enhanced where it can be. The predicted PC and PEC are then reviewed relative to the appropriate EALs and the headroom (gap between the PEC and the EAL) that remains once the Proposed Development is in operation - i.e., is there a risk of an exceedance of an EAL and/ or does the operation of the Proposed Development constrain future development of the area.

For this assessment, the 'insignificant' terminology used in the UK EA guidance¹¹ applies to effects that can be described as 'Imperceptible' to 'Slight' in the EPA Guidelines¹⁰. It may also apply to effects that can be described as 'Moderate' in the EPA Guidelines, where such effects relate to a limited number of sensitive receptors and / or the EAL remain not at risk of any exceedance. This is justified by the 'Moderate' effect being listed as between the 'Imperceptible' and 'Significant' description of effects referred to by the EPA Guidelines¹⁰.

For impacts in nature conservation receptors, the UK EA Guidance states that they may be considered insignificant ('not significant') where:

- The short-term PC is less than 10% of the short-term environmental standard for protected conservation areas; and
- The long-term PC is less than 1% of the long-term environmental standard for protected conservation areas.

Where the long-term process contribution exceeds this criteria, ecologically sensitive receptors may also be considered insignificant ('not significant') where:

- The long-term PEC is <70% of the EAL.

Where an impact on nature conservation sensitive receptors still cannot be screened as insignificant at this stage, again it does not necessarily mean that the effect is now significant. Model inputs and assumptions shall be reviewed, and detail enhanced where it can be. The predicted PC and PEC are then reviewed relative to the appropriate EAL and the headroom that remains once the Proposed Development is in operation – i.e., is there a risk of an exceedance of an EAL and / or does the operation of the Proposed Development constrain future development of the area.

Again, the 'insignificant' terminology used in the UK EA Guidance¹¹ applies to effects that can be described as 'Imperceptible' to 'Slight' in the EPA Guidelines¹⁰. It may also apply to effects that can be described as 'Moderate' in the EPA Guidelines, where such effects relate to a limited number of sensitive receptors and / or the EAL remain not at risk of any exceedance. Ultimately, the significance of air quality impacts on nature conservation sites has been determined by a professional ecologist.

IAQM Planning Approach

Like the UK EA Guidance¹¹, the IAQM and EPUK¹² approach does not define a graduating scale of human health receptor sensitivity. Instead, human health receptors are considered either sensitive or not, depending on the period of time for which they are exposed to emissions. The absolute magnitude of change in pollutant concentrations between the baseline and operational phase scenarios, in relation to the EAL, is described and this is used to consider the risk of those Standards and Levels being exceeded.

For a change in annual mean concentrations of a given magnitude, IAQM and EPUK have published recommendations for describing the impacts at individual receptors, as set out in the following table.

Table 7.13: The description of impacts referred to in the IAQM Guidance.

Long term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL) ¹				
	<1 (Imperceptible)	1 (Very Low)	2 to 5 (Low)	6 to 10 (Medium)	>10 (Large)
75% or less of AQAL	Negligible	Negligible	Negligible	Slight	Moderate
76% - 94% of AQAL	Negligible	Negligible	Slight	Moderate	Moderate
95% - 102% of AQAL	Negligible	Slight	Moderate	Moderate	Substantial
103% - 109% of AQAL	Negligible	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Negligible	Moderate	Substantial	Substantial	Substantial

Notes:

¹ For this assessment, IAQM effect descriptions are aligned with EPA Guidelines as follows:

Negligible = Imperceptible; Slight = Not Significant to Slight; Moderate = Moderate; and Substantial = Significant to Profound

The IAQM and EPUK Guidance states that the descriptors are for individual receptors only and that overall significance is determined using professional judgement. It also states that it is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the objective value. For a given year in the future, it is impossible to define the new total concentration without recognising the inherent uncertainty, which is why there is a category that has a range around the objective value, rather than being exactly equal to it.

A change in predicted long-term (annual mean) concentrations of less than 0.5% of an EAL is considered to be 'imperceptible'. A PC (impact) that is 'Negligible', given normal bounds of variation, will not be capable of having a direct effect on local air quality that could be considered to be significant.

The IAQM and EPUK guidance suggests the potential for 'Low' air quality impacts as a result of changes in pollutant concentrations between 2% and 5% of relevant EALS. For example, for long-term NO₂ concentrations, this relates to changes in concentrations ranging from 0.6 – 2.1 µg/m³. In practice, changes in concentration of this magnitude, and in particular changes at the lower end of this band are likely to be very difficult to distinguish due to the inter-annual effects of varying meteorological conditions. Therefore, in the overall evaluation of significance the potential for impacts to have

significant air quality effect within this band will be considered in this context and will not be capable of having a direct effect on local air quality that can be considered to be significant.

Changes in concentration of more than 5% ('Medium' and 'High', the two highest bands) are considered to be of a magnitude which is far more likely to be discernible above the natural variation in baseline conditions and, as such, carry additional weight within the overall evaluation of significance for air quality. 'Moderate' impacts do not necessarily constitute a significant effect, where they do not contribute to an exceedance or risk of an exceedance of an EAL, particularly where such impacts relate to a small minority of receptors with the majority experiencing lesser impacts. A 'Significant' to 'Profound' impact will almost certainly constitute a significant effect that will require additional mitigation to address.

The IAQM and EPUK Guidance¹² also provides thresholds for determining whether short-term impacts on human health sensitive receptors have the potential to cause a significant effect or not. Again, it is noted that the IAQM guidance is not specific to industrial facilities, but still provides a useful guide to scale the severity of impacts. This guidance deviates from the UK EA Guidance in that the criteria it provides does not take account of background concentrations, although the guidance does state that this is not intended to play down the importance of total short-term concentrations; the IAQM Guidance indicates that severity of peak short-term concentrations can be described without the need to reference background concentrations as the PC is used to measure impact, not the overall concentration at a receptor. The peak short-term PC from an elevated source has been adopted for this assessment as follows:

- PC $\leq$ 10% of the EAL represents an impact that is 'Imperceptible' to 'Not significant';
- PC 11-20% of the EAL is small in magnitude representing a 'Slight' impact;
- PC 21-50% of the EAL is medium in magnitude representing a 'Moderate' impact; and
- PC $>$ 51% of the EAL is large in magnitude representing a 'Significant' to 'Profound' impact.

7.3.4.3 Significance of Effects

Following the assessment of each individual air quality effect (construction dust and operational plant), the significance of all of the reported effects is then considered for the Proposed Development in their entirety. The potential for the Proposed Development to contribute to or interfere with the successful implementation of policies and strategies for the management of local air quality are considered if relevant, but the principal focus is any change to the likelihood of future achievement of the EALs (which also relate to compliance with Kerry County Council (KCC) goals for local air quality management and objectives are set for the protection of human health).

In terms of the significance of the effects (consequences) of any adverse impacts, an effect is reported as being either significant or not. If the overall effect of the Proposed Development on local air quality or on amenity is found to be 'Moderate' (where a large proportion of sensitive receptors are affected and/ or there is risk of EALs being exceeded) or 'Significant' to 'Profound', this is deemed to be significant for EIAR purposes. Effects found to be 'Moderate' (where limited sensitive receptors are affected and there is no risk of exceedance of an EAL) to 'Imperceptible' are not considered to be significant.

7.3.5 Limitations and Assumptions

The air quality assessment has followed an industry standard approach, with reference to relevant guidance documents and methodologies, to provide the best possible means of predicting potential air quality impacts associated with the Proposed Development at Offsite receptors, and the determination of significance. However, given the nature of the assessment, it is inevitable that there are limitations associated with any approach, and those relevant to this assessment are summarised:

- Inherent uncertainties with dispersion modelling:
 - The dispersion model can only be as accurate as the data inputted into it, including the source emissions data. To minimise the uncertainties associated with such data, the assessment has used emissions information from manufacturers, licences or stack emissions monitoring reports, as appropriate.
 - Meteorological data has been sourced from Shannon Airport, the nearest meteorological station to the Proposed Development site with the complete dataset required for dispersion modelling. It is located approximately 17km to the west of the Site. To reduce the uncertainty in the representativeness of the meteorological data, the assessment has modelled five years of meteorological data and reported the worst impact for each pollutant and averaging period over the five-year period for each receptor. The assessment has also accounted for the influence in varying terrain and surface roughness, to better represent local conditions in the vicinity of the Site.
- Uncertainties in baseline conditions:
 - The assessment refers to background air quality monitoring data reported by the EPA, and is therefore not project specific, in line with the approach set out in EPA AG4 guidance².
 - Background nitrogen deposition rate data is not reported as standard by the EPA. The background value used to inform this assessment has been taken from research published by the EPA¹³. In that research it is stated that “*annual estimated N deposition (wet and dry) to semi-natural grassland habitats ranged from 2 to 22kg ha⁻¹a⁻¹, with an average national deposition of 12.1kg ha⁻¹ a⁻¹”*. That average value was taken as the background for this assessment.

The air quality assessment has also made a number of assumptions where precise information or data is not available. Where possible, assumptions are informed by relevant guidance. Assumptions based on operational characteristics are precautionary. Key assumptions are summarised:

- It is assumed in the assessment that the Proposed Development will be operational for 1,800 hours of the year (either under normal operation or start-up conditions). This is precautionary as in reality it will operate for less than that.
- It is assumed that the TEG is operational 500 hours of the year. This is precautionary as in reality it will operate for less than that.

¹³ Development of Critical Loads for Ireland: Simulating Impacts on Systems (SIOS) Author: Julian Aherne, Jason Henry and Marta Wolniewicz.

- The rate of conversion of NO_x to NO₂ from modelled emissions sources has been assumed to be 100% for annual mean NO₂ and 50% for hourly mean NO₂ across the study area, in the absence of NO_x, NO₂ and O₃ data. In reality, the conversion of NO_x to NO₂ at locations close to the source, the conversion of NO_x to NO₂ is likely to be less efficient than that, the assessment therefore takes a conservative approach.

7.4 Baseline Environment

7.4.1 Monitored Baseline

EU legislation on air quality requires that Member States divide their territory into zones for the assessment and management of air quality. The zones in place in Ireland as cited in AG4² are:

- Zone A: Dublin conurbation.
- Zone B: Cork conurbation.
- Zone C: large towns with a population >15,000; and
- Zone D: the remaining area of Ireland.

All receptors used within this assessment are consistent with Zone D.

Background pollutant data is added to the modelled pollutant concentrations and deposition rates to estimate total pollutant concentrations and deposition rates, which can then be compared against the relevant EALs.

Background concentrations were sourced from EPA monitoring data for monitoring locations included EPA Zone D, which is used to represent rural locations. Site specific nitrogen and acid deposition values are used in this assessment, these values represent the Proposed Development Site as it currently exists. In this manner, it includes existing sources of pollutant, such as the Tarbert HFO Power Station, which will be decommissioned after December 2023. The background pollutant concentrations are therefore likely to be an over-estimate of the real-world situation for this assessment. It would not be practical to remove the input of the Tarbert HFO Power Station from these background concentrations because of the method by which these background concentrations are determined as they are not formed with an emissions inventory whereby an individual source contribution can be extracted. The assessment therefore presents a conservative estimate of air pollution with the Proposed Development. All relevant background concentrations used to inform this assessment are summarised in Table 7.14.

Table 7.14: EPA Zone D Background Concentrations and Deposition Rate^a

Pollutant	Averaging Period	Concentration (µg/m ³) or Deposition Rate (kg/ha/yr)
NO _x	Annual mean	14.0
NO ₂	Annual mean	7.4
	1-hr ^c	14.8

Pollutant	Averaging Period	Concentration ($\mu\text{g}/\text{m}^3$) or Deposition Rate ($\text{kg}/\text{ha}/\text{yr}$)
SO ₂	Annual mean	5.0
	1-hr	10.0
	24-hr	10.0
N deposition	Annual rate ^d	Site specific
Acid deposition	Annual rate ^d	Site specific
CO	8-hr rolling	0.8
PM ₁₀	Annual mean	12.7
	24-hr	25.4
PM _{2.5}	Annual mean	8.4

^aAverage across Zone D monitoring sites taken from summary tables that informed the Air quality in Ireland 2022 report.

^bIncludes elevated NO_x concentrations monitored at Birr due to proximity to N52.

^cShort-term background concentrations are double the annual mean concentrations.

^dData collected from APIS.

7.4.2 Determination of Stack Height

7.4.2.1 Stack Height Assessment

A stack height assessment has been undertaken to establish a suitable release height of emissions to encourage optimal dispersion and help mitigate significant air quality effects. The results of the stack height assessment are shown in Plate 7.3, where the NO₂ concentrations are presented for a high stack release temperature (454 °C) and low stack release temperature scenario (350 °C). Meteorological years 2017 -2022 where tested, 2018 meteorological is presented in Plate 7.3 as the year which was predicted to experience the highest impact.

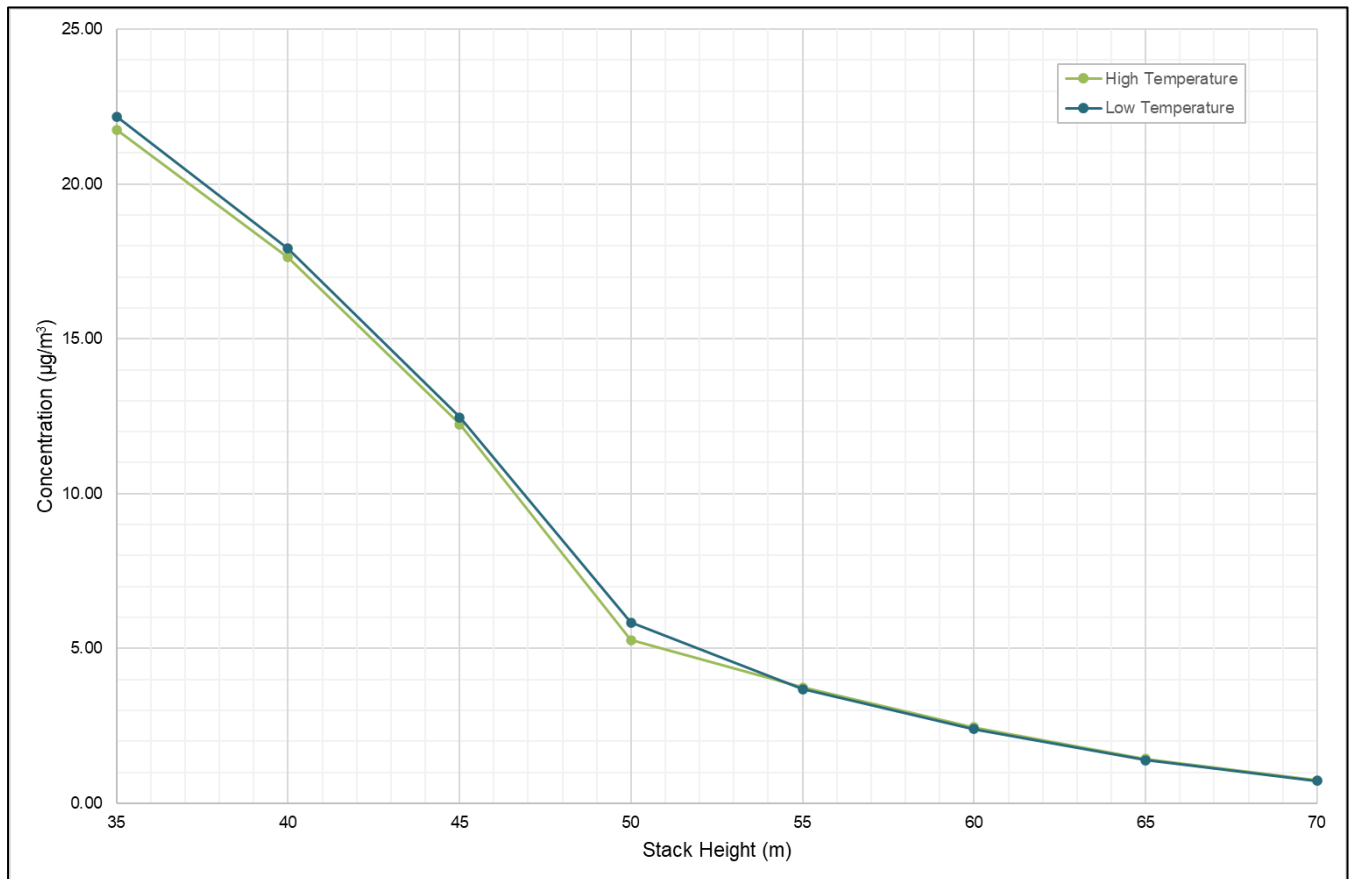


Plate 7.3: Annual Mean NO₂ Contribution by Stack Height

Plate 7.3 shows that increasing the stack height has the greatest benefit at the location of maximum impact within the model domain.

A stack height of 55m is proposed for the proposed OCGT. Releasing emissions from a height of 55m provides a relatively low concentration of pollutant at the location of maximum impact within the model domain. A stack higher than this is predicted to offer diminishing returns in terms of concentrations of pollutants at receptors, As shown in Plate 7.3. At a height of 55m the predicted impact at the high temperature and low temperature scenarios are predicted to converge, as shown in Plate 7.3.

7.5 Potential Impacts

7.5.1 Construction Dust Assessment

7.5.1.1 Magnitude Identification

Magnitude of risk of dust impacts for the Proposed Development, based on examples described in the methodology section of this chapter as set out in Table 7.15.

Table 7.15: Dust Emission Magnitude of Construction/ Demolition Activities for the Proposed Development

Activity	Dust Emission Magnitude Assigned for Proposed Development	Reasoning
Demolition	Small	Demolition activities will be minimal, the total volume of material being removed is likely to be <20,000m ³ and not a potentially dusty material
Earthworks	Small	The property boundary covers a large area, however, the Site boundary and the area within that where earthworks are likely to take place is very small. It is, therefore, unlikely that more than a few earthmovers will be on the Site at any one time, due to the fact that the site will continue to function while construction occurs. In addition, open areas at the Site are currently comprised of hardstanding which is not a dusty material.
Construction	Small	Total building volume is anticipated to be small and is likely to consist mainly of prefabricated modules, minimising the use of potentially dusty materials on site.
Trackout	Small	A small number of HDV trips is anticipated, there is little unpaved road around the application site

Table 7.15 shows that the dust emission magnitudes have been defined as small for demolition, earthworks, construction and trackout.

7.5.1.2 Sensitivity of the Area

To determine the sensitivity of the surrounding receptors to dust soiling, the criteria outlined in the methodology section are initially used to determine receptor sensitivity. Receptors are located within a predominantly agricultural area, where the baseline dust soiling environment would be expected to be high. However, with consideration to the fact that the nearest receptors are located particularly close to the Site boundary and traffic route, the final sensitivity of the area is Medium.

To determine the sensitivity of the surrounding receptors to human health, baseline annual mean PM₁₀ concentrations have been considered, as presented in Table 7.14. It is estimated that baseline annual mean PM₁₀ concentrations are low (as qualified in Table 7.5), the final sensitivity of the area is Low.

7.5.1.3 Risk of Impacts from Unmitigated Activities

The risk of impacts from dust soiling and human health caused by unmitigated activities is presented in Table 7.16.

Table 7.16: Risk of Impacts from Unmitigated Activities from the Proposed Development

Potential Impacts	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low Risk	Low Risk	Low Risk	Negligible
Human Health	Negligible	Negligible	Negligible	Negligible

The risk assessment for construction dust indicates that there would be a negligible to low risk of unmitigated dust impacts on human health (PM₁₀) and a negligible risk for dust soiling from unmitigated activities for the Proposed Development. These risk classifications are solely used to select the appropriate schedule of mitigation measures, examples of which are set out in guidance published by the IAQM⁷. For all but the smallest of sites the use of the high-risk schedule of measures represents good working practice.

On consideration of the likely effectiveness of these measures, additional site-specific measures will be identified in the contractors' Construction Environmental Management Plan (CEMP). The CEMP has a procedure for dealing with complaints during construction and associated works, where these complaints require actions to further mitigate dust emissions, measures to address this may include:

- Cutting and grinding operations, if required, will be conducted using equipment and techniques that reduce emissions and incorporate appropriate dust suppression measures.
- Damping down of dust-generating equipment and vehicles within the Site and the provision of dust suppression in all areas of the Site that are likely to generate dust.
- Use water suppression and regular cleaning during earth moving activities.
- Materials stockpiles likely to generate dust enclosed or securely sheeted, damped down or stabilised as appropriate.
- Covering materials, deliveries or loads entering and leaving the construction site.
- Mixing of grout or cement-based materials will be undertaken using appropriate techniques/mitigation.
- Measures will be taken to keep roads and accesses clean; and
- Vehicle, plant and equipment maintenance records will be kept on-site and reviewed regularly.

It is considered that with the implementation of appropriate good practice control measures set out in the CEMP, the potential effect from fugitive emissions of dust during construction would not be significant.

7.5.2 Operational Phase Site Emissions Assessment

The assessment has quantified the contribution of emissions from the proposed OCGT generator to pollutant concentrations at 15 human health sensitive receptors and pollutant concentrations and deposition rates at 15 ecological sensitive receptors within the model domain. These receptors are shown in Figure 7.3 and Figure 7.4 (refer to EIAR Volume III). The contribution has been compared to relevant EALs to determine the magnitude of impact. The pollutant contribution to pollutant concentrations and deposition rates has been added to the background contribution to provide an estimate of total pollutant concentrations and deposition rates. These values can be directly compared to the relevant EALs.

This results section is split among the two scenarios, the Proposed Development Scenario, which comprises the proposed OCGT, as presented in Section 7.3.3.1. As discussed previously, results are presented as PC, with reference to the contribution from modelled sources, and with addition of BC, as PEC. Both PC and PEC are presented in terms of concentration and as a portion of the relevant EAL.

Isopleth plots providing a visual representation of how pollutants disperse are presented for the Proposed Development Scenario in Figure 7.5 to Figure 7.12 (refer to EIAR Volume III).

7.5.2.1 Proposed Development Scenario

Table 7.17: presents annual mean concentrations of NO₂ at human receptor locations in the Proposed Development Scenario.

Table 7.17: Modelled Annual-Mean NO₂ Emissions at Human Health Receptor Locations – Proposed Development

Receptor ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/EAL (%)
		2017	2018	2019	2020	2021					
R1	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7.4	7.4	18.5%
R2	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7.4	7.4	18.5%
R3	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7.4	7.4	18.5%
R4	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7.4	7.4	18.5%
R5	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7.4	7.4	18.5%
R6	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7.4	7.4	18.5%
R7	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7.4	7.4	18.5%
R8	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7.4	7.4	18.5%
R9	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7.4	7.4	18.5%
R10	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7.4	7.4	18.5%
R11	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7.4	7.4	18.5%
R12	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7.4	7.4	18.5%
R13	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7.4	7.4	18.5%

Receptor ID	EAL (µg/m³)	PC (µg/m³)					Max PC (µg/m³)	PC/EAL (%)	BC (µg/m³)	PEC (µg/m³)	PEC/EAL (%)
		2017	2018	2019	2020	2021					
R14	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7.4	7.4	18.5%
R15	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	7.4	7.4	18.5%

The results presented in Table 7.17: show that predicted concentrations of annual mean NO₂ are low at human receptors. The maximum PC at any human receptor location is less than 0.1µg/m³, which is less than 0.1% of the EAL. The PEC at each site is 18.5% of the EAL.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, all PCs are less than 1% of the EAL and, under those criteria, can be screened out as not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the long-term total concentration of pollutants (PEC). The largest predicted PC of annual mean NO₂, as presented in Table 7.17:, is 0.1% of the EAL, and with a PEC of 18.6% of the EAL, the impact can be described as imperceptible for all receptors, using EPA terms. The impact of annual mean NO₂ at human receptors is therefore not significant.

Table 7.18 shows predicted concentrations of 99.79th percentile 1-hour mean NO₂ at human receptors in the Proposed Development Scenario.

Table 7.18: Modelled 99.79th Percentile 1-Hour Mean NO₂ Emissions at Human Health Receptor Locations – Proposed Development

Receptor ID	EAL (µg/m³)	PC (µg/m³)					Max PC (µg/m³)	PC/EAL (%)	BC (µg/m³)	PEC (µg/m³)	PEC/EAL (%)
		2017	2018	2019	2020	2021					
R1	200	0.1	0.4	0.4	0.3	0.3	0.4	0.2	14.8	15.2	7.6%
R2	200	0.1	0.3	0.4	0.3	0.2	0.4	0.2	14.8	15.2	7.6%
R3	200	0.1	0.2	0.3	0.2	0.2	0.3	0.2	14.8	15.1	7.6%
R4	200	1.1	0.9	0.9	1.2	1.0	1.2	0.6	14.8	16.0	8.0%
R5	200	0.6	1.4	1.2	1.4	0.9	1.4	0.7	14.8	16.2	8.1%
R6	200	0.5	1.4	1.0	1.5	0.6	1.5	0.8	14.8	16.3	8.2%
R7	200	0.7	1.0	0.9	1.1	0.6	1.1	0.6	14.8	15.9	8.0%
R8	200	1.4	1.0	1.2	1.7	1.0	1.7	0.9	14.8	16.5	8.3%
R9	200	1.0	1.0	1.2	1.8	0.8	1.8	0.9	14.8	16.6	8.3%
R10	200	2.4	2.4	2.3	2.4	1.9	2.4	1.2	14.8	17.2	8.6%
R11	200	2.9	2.8	2.9	2.9	2.4	2.9	1.5	14.8	17.7	8.9%
R12	200	0.9	1.1	1.0	1.1	0.9	1.1	0.6	14.8	15.9	8.0%
R13	200	2.7	2.7	2.7	2.5	2.5	2.7	1.4	14.8	17.5	8.8%
R14	200	1.2	1.3	1.3	1.3	0.8	1.3	0.7	14.8	16.1	8.1%
R15	200	0.4	0.2	0.4	0.5	0.3	0.5	0.3	14.8	15.3	7.7%

The results presented in Table 7.18 show that predicted concentrations of 99.79th percentile 1-hour mean NO₂ are low at human receptors. The maximum PC at any human receptor location (R11) is 2.9µg/m³, which is 1.5% of the EAL. The maximum PEC at any human receptor location (also R11) is 17.7µg/m³, which is 8.9% of the EAL.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, all PCs are less than 10% of the Environmental Assessment Level, under those criteria, would be considered not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the short-term PC. The largest predicted PC of 1-hour mean NO₂, as presented in Table 7.18, is 1.5% of the EAL, and with the PEC 8.9% of the EAL, the impact can be described as imperceptible at most for any receptors. The impact of 1-hour mean NO₂ at human receptors is therefore not significant.

Table 7.19 shows predicted concentrations of 99.18th percentile 24-hour mean SO₂ at human receptors in the Proposed Development Scenario.

Table 7.19: Modelled 99.18th Percentile 24-Hour Mean SO₂ Emissions at Human Health Receptor Locations – Proposed Development

Receptor ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/EAL (%)
		2017	2018	2019	2020	2021					
R1	125	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	10.0	10.0	8.0%
R2	125	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	10.0	10.0	8.0%
R3	125	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	10.0	10.0	8.0%
R4	125	0.1	0.1	0.1	0.1	<0.1	0.1	0.1	10.0	10.1	8.1%
R5	125	<0.1	0.1	0.1	0.1	<0.1	0.1	0.1	10.0	10.1	8.1%
R6	125	<0.1	0.1	<0.1	0.1	<0.1	0.1	0.1	10.0	10.1	8.1%
R7	125	<0.1	0.1	0.1	0.1	<0.1	0.1	0.1	10.0	10.1	8.1%
R8	125	0.1	0.1	0.1	0.1	<0.1	0.1	0.1	10.0	10.1	8.1%
R9	125	<0.1	0.1	0.1	0.1	<0.1	0.1	0.1	10.0	10.1	8.1%
R10	125	0.2	0.2	0.2	0.3	0.1	0.3	0.2	10.0	10.3	8.2%
R11	125	0.2	0.3	0.2	0.3	0.1	0.3	0.2	10.0	10.3	8.2%
R12	125	<0.1	0.1	<0.1	<0.1	<0.1	0.1	0.1	10.0	10.1	8.1%
R13	125	0.2	0.2	0.2	0.1	0.1	0.2	0.2	10.0	10.2	8.2%
R14	125	0.1	0.1	0.1	0.1	0.1	0.1	0.1	10.0	10.1	8.1%
R15	125	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	10.0	10.0	8.0%

The results presented in Table 7.19 show that predicted concentrations of 99.18th percentile 24-hour mean SO₂ are low at human receptors. The maximum PC at any human receptor location (R10 and R11) is 0.3µg/m³, which is 0.2% of the EAL. The maximum PEC at any human receptor location (also R10 and R11) is 10.3µg/m³, which is 8.2% of the EAL.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, all PCs are less than 10% of the Environmental Assessment, under those criteria, would be considered not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the short-term PC. The largest predicted PC of 24-hour mean SO₂, as presented in Table 7.19, is 0.2% of the EAL, and with the PEC 8.2% of the EAL, the impact can be described as imperceptible at the most affected receptor. The impact of 24-hour mean SO₂ at human receptors is therefore not significant.

Table 7.20 shows predicted concentrations of 99.73rd percentile 1-hour mean SO₂ at human receptors in the Proposed Development Scenario.

Table 7.20: Modelled 99.73rd Percentile 1-Hour Maximum SO₂ Emissions at Human Health Receptor Locations – Proposed Development

Receptor ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/EAL (%)
		2017	2018	2019	2020	2021					
R1	350	<0.1	0.1	0.1	<0.1	<0.1	0.1	<0.1	10.0	10.1	2.9%
R2	350	<0.1	0.1	0.1	<0.1	<0.1	0.1	<0.1	10.0	10.1	2.9%
R3	350	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	10.0	10.0	2.9%
R4	350	0.2	0.2	0.2	0.2	0.2	0.2	0.1	10.0	10.2	2.9%
R5	350	0.1	0.2	0.2	0.2	0.1	0.2	0.1	10.0	10.2	2.9%
R6	350	0.1	0.2	0.1	0.2	0.1	0.2	0.1	10.0	10.2	2.9%
R7	350	0.1	0.2	0.2	0.2	0.1	0.2	0.1	10.0	10.2	2.9%
R8	350	0.2	0.2	0.2	0.3	0.2	0.3	0.1	10.0	10.3	2.9%
R9	350	0.2	0.2	0.2	0.2	0.1	0.2	0.1	10.0	10.2	2.9%
R10	350	0.5	0.5	0.5	0.5	0.3	0.5	0.1	10.0	10.5	3.0%
R11	350	0.6	0.6	0.6	0.6	0.5	0.6	0.2	10.0	10.6	3.0%
R12	350	0.2	0.2	0.2	0.2	0.2	0.2	0.1	10.0	10.2	2.9%
R13	350	0.5	0.5	0.5	0.5	0.5	0.5	0.1	10.0	10.5	3.0%
R14	350	0.2	0.3	0.3	0.2	0.1	0.3	0.1	10.0	10.3	2.9%
R15	350	0.1	<0.1	0.1	0.1	0.1	0.1	<0.1	10.0	10.1	2.9%

The results presented in Table 7.20 show that predicted concentrations of 99.73rd percentile 1-hour mean SO₂ are generally low at human receptors. The maximum PC at any human receptor location (R11) is 0.6 µg/m³, which is less than 0.1% of the EAL. The maximum PEC at any human receptor location (also R11) is 10.6µg/m³, which is 3.0% of the EAL.

Within the context of EPA guidance on maximum allowable PC⁹ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹⁰, all PCs are less than 10% of the Environmental Assessment Level, under those criteria, would be considered not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the short-term PC. The largest predicted PC of 1-hour mean SO₂, as presented in Table 7.20, is less than 0.1% of the EAL, and with the PEC 3.0% of the EAL, the impact can be described as imperceptible at the most affected receptor. As the PEC is considerably smaller than the EAL, the impact of 24-hour mean SO₂ at human receptors is therefore not significant.

Table 7.21 shows predicted concentrations of maximum 8-hour mean CO at human receptors in the Proposed Development Scenario.

Table 7.21: Modelled Maximum 8-Hour Mean CO Emissions at Human Health Receptor Locations – Proposed Development

Recept or ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/ EAL (%)
		2017	2018	2019	2020	2021					
R1	10,000	0.9	1.6	1.9	1.4	1.2	1.9	<0.1	0.8	2.7	<0.1%
R2	10,000	0.7	1.7	2.2	1.4	1.0	2.2	<0.1	0.8	3.0	<0.1%
R3	10,000	0.4	1.3	2.2	1.0	1.1	2.2	<0.1	0.8	3.0	<0.1%
R4	10,000	4.4	3.9	8.1	10.1	2.7	10.1	0.1	0.8	10.9	0.1%
R5	10,000	6.1	8.8	5.1	5.0	5.0	8.8	0.1	0.8	9.6	0.1%
R6	10,000	5.1	7.3	6.7	8.1	3.3	8.1	0.1	0.8	8.9	0.1%
R7	10,000	4.1	4.7	3.4	4.8	3.7	4.8	<0.1	0.8	5.6	0.1%
R8	10,000	8.6	7.4	6.1	10.6	5.5	10.6	0.1	0.8	11.4	0.1%
R9	10,000	5.7	4.7	6.8	8.5	3.3	8.5	0.1	0.8	9.3	0.1%
R10	10,000	8.7	8.8	7.8	8.6	6.9	8.8	0.1	0.8	9.6	0.1%
R11	10,000	9.2	9.9	9.9	9.6	7.4	9.9	0.1	0.8	10.7	0.1%
R12	10,000	5.1	5.0	3.0	2.7	3.0	5.1	0.1	0.8	5.9	0.1%
R13	10,000	10.2	1<0.1	8.3	7.6	7.0	10.2	0.1	0.8	11.0	0.1%
R14	10,000	3.6	3.4	4.5	4.6	3.3	4.6	<0.1	0.8	5.4	0.1%
R15	10,000	2.3	1.0	3.8	3.1	2.0	3.8	<0.1	0.8	4.6	<0.1%

The results presented in Table 7.21 show that predicted concentrations of maximum 8-hour mean CO are low at human receptors. The maximum PC at any human receptor location (R8) is 10.6µg/m³, which is 0.1% of the EAL. The maximum PEC at any human receptor location (also R8) is 11.4µg/m³, which is 0.1% of the EAL.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, all PCs are less than 10% of the EAL and, under those criteria, would be considered not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the short-term PC. The largest

predicted PC of maximum 8-hour CO, as presented in Table 7.21, is 0.1% of the EAL, and with the PEC 0.1% of the EAL, the impact can be described as imperceptible for all receptors. The impact of maximum 8-hour CO at human receptors is therefore not significant.

Table 7.22 shows predicted concentrations of annual mean PM₁₀ at human receptors in the Proposed Development Scenario.

Table 7.22: Modelled Annual Mean PM₁₀ Emissions at Human Health Receptor Locations – Proposed Development

Receptor ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/EAL (%)
		2017	2018	2019	2020	2021					
R1	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R2	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R3	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R4	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R5	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R6	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R7	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R8	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R9	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R10	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R11	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R12	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R13	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R14	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R15	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%

The results presented in Table 7.22 show that predicted concentrations of annual mean PM₁₀ are low at human receptors. The maximum PC at any human receptor location is less than 0.1µg/m³, which is less than 0.1% of the EAL. The maximum PEC at any human receptor location is 12.7µg/m³, which is 31.8% of the EAL.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, all PCs are less than 1% of the EAL and, under those criteria, would be considered not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the long-term total concentration of pollutants (PEC). The largest predicted PC of annual mean PM₁₀, as presented in Table 7.22, is less than 0.1% of the EAL, and with the PEC 31.8% of the EAL, the impact can be described as imperceptible all receptors. The impact of annual mean PM₁₀ at human receptors is therefore not significant.

Table 7.23 shows predicted concentrations of 90.41st percentile 24-hour mean PM₁₀.

Table 7.23: Modelled 90.41st Percentile 24-Hour Mean PM₁₀ Emissions at Human Health Receptor Locations – Proposed Development

Receptor ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/ EAL (%)
		2017	2018	2019	2020	2021					
R1	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	25.4	25.4	50.8%
R2	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	25.4	25.4	50.8%
R3	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	25.4	25.4	50.8%
R4	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	25.4	25.4	50.8%
R5	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	25.4	25.4	50.8%
R6	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	25.4	25.4	50.8%
R7	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	25.4	25.4	50.8%
R8	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	25.4	25.4	50.8%
R9	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	25.4	25.4	50.8%
R10	50	0.1	0.1	0.1	0.1	<0.1	0.1	0.2	25.4	25.5	51.0%
R11	50	0.1	0.1	0.1	0.1	<0.1	0.1	0.2	25.4	25.5	51.0%
R12	50	0.1	0.1	0.1	<0.1	<0.1	0.1	0.2	25.4	25.5	51.0%
R13	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	25.4	25.4	50.8%
R14	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	25.4	25.4	50.8%
R15	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	25.4	25.4	50.8%

The results presented in Table 7.23 show that predicted concentrations of 90.41st percentile 24-hour mean PM₁₀ are low at human receptors. The maximum PC at any human receptor location (R10, R11 and R12) is 0.1µg/m³, which is 0.2% of the EAL. The maximum PEC at any human receptor location (also R10, R11 and R12) is 25.5µg/m³, which is 51.0% of the EAL.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, all PCs are less than 10% of the EAL and, under those criteria, would be considered not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the short-term PC. The largest predicted PC of 24-hour mean PM₁₀, as presented in Table 7.23, is 0.2% of the EAL, and with the PEC 51.0% of the EAL, the impact can be described as imperceptible for all receptors. The impact of 24-hour mean PM₁₀ at human receptors is therefore not significant.

Table 7.24 show predicted concentrations of annual mean PM_{2.5} at human receptors in the Proposed Development Scenario.

Table 7.24: Modelled Annual Mean PM_{2.5} Emissions at Human Health Receptor Locations – Proposed Development

Receptor ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/EAL (%)
		2017	2018	2019	2020	2021					
R1	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R2	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R3	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R4	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R5	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R6	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R7	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R8	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R9	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R10	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R11	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R12	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R13	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R14	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R15	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%

The results presented in Table 7.22 show that predicted concentrations of annual mean PM_{2.5} are low at human receptors. The maximum PC at any human receptor location is less than 0.1µg/m³, which is less than 0.1% of the EAL. The maximum PEC at any human receptor location is 8.4µg/m³, which is 42.0% of the EAL.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, all PCs are less than 1% of the EAL and, under those criteria, would be considered not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the long-term total concentration of pollutants (PEC). The largest predicted PC of annual mean PM₁₀, as presented in Table 7.22, is less than 0.1% of the EAL, and with the PEC 42.0% of the EAL, the impact can be described as imperceptible at all receptors. The impact of annual mean PM_{2.5} at human receptors is therefore not significant.

Table 7.25 show predicted concentrations of annual mean NO_x at ecological receptors in the Proposed Development Scenario.

Table 7.25: Modelled Annual Mean NO_x Emissions at Ecological Receptor Locations – Proposed Development

Receptor ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/EAL (%)
		2017	2018	2019	2020	2021					
E1a	30	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	14.0	14.0	46.7%
E1b	30	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	14.0	14.0	46.7%
E1c	30	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	14.0	14.0	46.7%
E2a	30	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	14.0	14.0	46.7%
E2b	30	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	14.0	14.0	46.7%
E2c	30	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	14.0	14.0	46.7%
E2d	30	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	14.0	14.0	46.7%
E2e	30	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	14.0	14.0	46.7%
E2f	30	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	14.0	14.0	46.7%
E2g	30	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	14.0	14.0	46.7%
E2h	30	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	14.0	14.0	46.7%
E2i	30	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	14.0	14.0	46.7%
E2j	30	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	14.0	14.0	46.7%
E3	30	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	14.0	14.0	46.7%
E4	30	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	14.0	14.0	46.7%

The results presented in Table 7.25 show that predicted concentrations of annual mean NO_x are low at ecological receptors. The maximum PC at any ecological receptor location is less than 0.1µg/m³, which is less than 0.1% of the EAL. The maximum PEC at any ecological receptor location is 14.0µg/m³, which is 46.7% of the EAL.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, all PCs are less than 1% of the EAL and, under those criteria, would be considered not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the long-term total concentration of pollutants (PEC). The largest predicted PC of annual mean NO_x, as presented in Table 7.25, is less than 0.1% of the EAL, and with the PEC 46.7% of the EAL, the impact can be described as imperceptible for all receptors. The impact of annual mean NO_x at ecological receptors is therefore not significant.

Table 7.26 shows predicted concentrations of annual mean SO₂ at ecological receptors in the Proposed Development Scenario.

Table 7.26: Modelled Annual Mean SO₂ Emissions at Ecological Receptor Locations – Proposed Development

Receptor ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/EAL (%)
		2017	2018	2019	2020	2021					
E1a	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5.0	5.0	25.0%
E1b	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5.0	5.0	25.0%
E1c	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5.0	5.0	25.0%
E2a	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5.0	5.0	25.0%
E2b	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5.0	5.0	25.0%
E2c	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5.0	5.0	25.0%
E2d	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5.0	5.0	25.0%
E2e	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5.0	5.0	25.0%
E2f	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5.0	5.0	25.0%
E2g	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5.0	5.0	25.0%
E2h	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5.0	5.0	25.0%
E2i	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5.0	5.0	25.0%
E2j	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5.0	5.0	25.0%
E3	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5.0	5.0	25.0%
E4	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5.0	5.0	25.0%

The results presented in Table 7.26 show that predicted concentrations of annual mean SO₂ are low at ecological receptors. The maximum PC at ecological receptor locations (E2i) is 0.0012µg/m³, which is less than 0.1% of the EAL. The maximum PEC at any ecological receptor location is 5.0µg/m³, which is 25% of the EAL.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, all PCs are less than 1% of the EAL and, under those criteria, would be considered not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the long-term total concentration of pollutants (PEC). The largest predicted PC of annual mean SO₂, as presented in Table 7.26, is less than 0.1% of the EAL, and with the PEC 25.0% of the EAL, the impact can be described as imperceptible for all receptors. As the PEC is considerably smaller than the EAL, the impact is not significant.

Table 7.27 shows predicted concentrations of annual nitrogen deposition at ecological receptors in the Proposed Development Scenario.

Table 7.27: Modelled Annual Nitrogen Deposition at Ecological Receptor Locations – Proposed Development

Receptor ID	EAL (kg/ha/yr)	Max PC (µg/m ³)		Total N Dep (kg/ha/yr)	PC/EAL (%)	BC (kg/ha/yr)	PEC (kg/ha/yr)	PEC/EAL (%)
		NO _x	NH ₃					
E1a	5	<0.01	<0.01	<0.001	<0.1	3.98	3.98	79.6
E1b	5	<0.01	<0.01	<0.001	<0.1	3.98	3.98	79.6
E1c	5	<0.01	<0.01	<0.001	<0.1	3.98	3.98	79.6
E2a	5	<0.01	<0.01	<0.001	<0.1	5.16	5.16	103.2
E2b	5	<0.01	<0.01	<0.001	<0.1	5.16	5.16	103.2
E2c	5	<0.01	<0.01	<0.001	<0.1	5.16	5.16	103.2
E2d	5	0.01	<0.01	0.001	<0.1	3.86	3.86	77.2
E2e	5	0.01	<0.01	0.001	<0.1	3.91	3.91	78.2
E2f	5	<0.01	<0.01	<0.001	<0.1	3.98	3.98	79.6
E2g	5	0.01	<0.01	0.002	<0.1	3.28	3.28	65.6
E2h	5	0.01	<0.01	0.001	<0.1	3.45	3.45	69.0
E2i	5	0.01	<0.01	0.002	<0.1	4.14	4.14	82.8
E2j	5	<0.01	<0.01	<0.001	<0.1	5.02	5.02	100.4
E3	10	0.01	<0.01	0.001	<0.1	5.02	5.02	50.2
E4	5	0.01	<0.01	0.001	<0.1	5.00	5.00	100.0

The results presented in Table 7.27 show that predicted concentrations of annual nitrogen deposition are low at ecological receptors. The maximum PC (contribution from the Proposed Development) at any ecological receptor location (E2g and E2i) is 0.002 kg/ha/year, which is <0.1% of the EAL. The maximum PEC at any ecological receptor location (E2a, E2b and E2c) is 5.16 kg/ha/year, which is 103.2% of the EAL. The table shows that there is a high background contribution of nitrogen deposition at all receptor locations, the predicted PC, by comparison, is very small.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*(AQS – BC) where there is a significant background concentration), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, the impacts of nitrogen deposition at all receptors can be screened out as not significant based on the screening criteria, this is because the PC is less than 1% at all receptors.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the long-term total concentration of pollutants (PEC). The largest predicted PC of annual mean deposited nitrogen, as presented in Table 7.27, is <0.1% of the EAL, the impact can be described as imperceptible for all receptors. The impact of annual mean deposited nitrogen at ecological receptors is therefore not significant.

Table 7.28 shows predicted concentrations of annual acid deposition at ecological receptors in the Proposed Development Scenario.

Table 7.28: Modelled Annual Acid Deposition at Ecological Receptor Locations – Proposed Development

Receptor ID	EAL (keq/ha/yr)			Max PC (keq/ha/yr)		PC/EAL (%)	BC (keq/ha/yr)		PEC/EAL (%)
	MinCLminN	MinCLMaxN	MinCLMaxS	N	S		N	S	
E1a	0.071	0.375	0.303	0.00001	0.00001	<0.1	0.06	0.28	90.7
E1b	0.071	0.375	0.303	0.00002	0.00001	<0.1	0.06	0.28	90.7
E1c	0.071	0.375	0.303	0.00001	0.00001	<0.1	0.06	0.28	90.7
E2a	0.071	0.375	0.303	0.00002	0.00002	<0.1	0.05	0.37	112.0
E2b	0.071	0.375	0.303	0.00002	0.00002	<0.1	0.05	0.37	112.0
E2c	0.071	0.375	0.303	0.00002	0.00002	<0.1	0.05	0.37	112.0
E2d	0.071	0.375	0.303	0.00011	0.00010	0.1	0.05	0.28	88.1
E2e	0.071	0.375	0.303	0.00011	0.00010	0.1	0.07	0.28	93.4
E2f	0.071	0.311	0.24	0.00003	0.00003	<0.1	0.06	0.28	109.3
E2g	0.071	0.311	0.24	0.00013	0.00012	0.1	0.04	0.23	86.9
E2h	0.071	0.311	0.24	0.00008	0.00007	<0.1	0.04	0.25	93.3
E2i	0.071	0.311	0.24	0.00015	0.00013	0.1	0.06	0.30	115.8
E2j	0.071	0.311	0.24	0.00004	0.00003	<0.1	0.04	0.36	128.6
E3	0.143	0.509	0.366	0.00011	0.00010	<0.1	0.05	0.36	80.6
E4	0.143	0.46	0.317	0.00006	0.00006	<0.1	0.04	0.36	87.0

The results presented in Table 7.28 show that predicted concentrations of annual acid deposition are generally low at ecological receptors. The maximum PC at all ecological receptor locations (E2d, E2e, E2g, E2i) is 0.1% of the EAL. The maximum PEC at any ecological receptor location (E2j) is 128.6% of the EAL. The table shows that there is a high background contribution of acid deposition at all receptor locations, the predicted PC, by comparison, is very small.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*(AQS – BC) where there is a significant background concentration), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, the impacts of acid deposition at all receptors can be screened out as not significant based on the screening criteria, this is because the PC is less than 1% at all receptors.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the long-term total concentration of pollutants (PEC). The largest predicted PC of annual mean deposited acid, as presented in Table 7.28, is 0.1% of the EAL, the impact can be described as imperceptible for all receptors. The impact of annual mean deposited acid at ecological receptors is therefore not significant.

7.6 Mitigation

Based on the assessments in this chapter, no additional measures to mitigate the effects of air quality are required, outside the scope of good practice and the Site's Industrial Emissions Licence. Additional mitigation measures to control fugitive dust in the construction phase of the Proposed Development are referred to in Section 7.5.1.3, which have been carried forward to the CEMP, and may be utilised in the event of complaints pertaining to dust emissions.

7.7 Cumulative Impacts

This section presents results from the cumulative developments scenario outlined in Section 7.3.3.2 of this document.

Table 7.29 presents annual mean concentrations of NO₂ at human receptor locations in the cumulative developments scenario which comprises the Proposed Development Scenario (proposed OCGT) and sources from cumulative developments (TEG and Moneypoint Power Station) as outlined in Section 7.3.3.2. These developments were identified as the only additional sources of air pollution not captured in the background concentrations which will be in place when the Proposed Development is operational.

Table 7.29: Modelled Annual-Mean NO₂ Emissions at Human Health Receptor Locations – Cumulative Developments

Receptor ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/EAL (%)
		2017	2018	2019	2020	2021					
R1	40	0.2	0.2	0.3	0.3	0.2	0.3	0.8	7.4	7.7	19.3%
R2	40	0.3	0.2	0.3	0.3	0.2	0.3	0.8	7.4	7.7	19.3%
R3	40	0.3	0.2	0.3	0.3	0.2	0.3	0.8	7.4	7.7	19.3%
R4	40	0.3	0.2	0.3	0.3	0.2	0.3	0.8	7.4	7.7	19.3%
R5	40	0.2	0.2	0.2	0.2	0.2	0.2	0.5	7.4	7.6	19.0%
R6	40	0.2	0.2	0.2	0.2	0.2	0.2	0.5	7.4	7.6	19.0%
R7	40	0.2	0.2	0.2	0.2	0.2	0.2	0.5	7.4	7.6	19.0%
R8	40	0.2	0.1	0.2	0.2	0.2	0.2	0.5	7.4	7.6	19.0%
R9	40	0.2	0.1	0.2	0.2	0.2	0.2	0.5	7.4	7.6	19.0%
R10	40	0.4	0.3	0.4	0.3	0.4	0.4	1.0	7.4	7.8	19.5%
R11	40	0.5	0.3	0.5	0.4	0.4	0.5	1.3	7.4	7.9	19.8%
R12	40	0.8	0.7	0.7	0.7	0.4	0.8	2.0	7.4	8.2	20.5%
R13	40	0.6	0.5	0.7	0.5	0.4	0.7	1.8	7.4	8.1	20.3%
R14	40	0.3	0.2	0.4	0.3	0.3	0.4	1.0	7.4	7.8	19.5%
R15	40	0.1	0.1	0.1	0.1	0.1	0.1	0.3	7.4	7.5	18.8%

The results presented in Table 7.29 show that predicted concentrations of annual mean NO₂ are low at human receptors. The maximum PC at any human receptor location (R12) is 0.8µg/m³, which is 2.0% of the EAL. The maximum PEC at any human receptor location (also R12) is 8.2µg/m³, which is 20.5% of the EAL.

Within the context of EPA guidance on maximum allowable PC₁₀ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, the effects at all human receptor locations can be considered as not significant as the PEC is less than 70%.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the long-term total concentration of pollutants (PEC). The largest predicted PC of the annual mean NO₂, as presented in Table 7.29, is 2.0% of the EAL, and with the PEC 20.5% of the EAL, the impact can be described as imperceptible at all receptors. The impact of annual mean NO₂ at human receptors is therefore not significant.

Table 7.30 shows the predicted concentrations of the 99.79th percentile 1-hour mean NO₂ at human receptors in the cumulative development scenario.

Table 7.30: Modelled 99.79th Percentile 1-Hour Mean NO₂ Emissions at Human Health Receptor Locations –Cumulative Developments

Receptor ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/EAL (%)
		2017	2018	2019	2020	2021					
R1	200	21.6	16.4	23.1	21.5	18.2	23.1	11.6	14.8	37.9	19.0%
R2	200	24.6	17.2	24.7	23.6	18.7	24.7	12.4	14.8	39.5	19.8%
R3	200	26.1	18.2	25.6	24.6	21.1	26.1	13.1	14.8	40.9	20.5%
R4	200	23.9	18.5	23.0	21.5	22.0	23.9	12.0	14.8	38.7	19.4%
R5	200	9.7	8.6	9.4	10.8	9.8	10.8	5.4	14.8	25.6	12.8%
R6	200	8.3	8.4	8.1	8.6	8.9	8.9	4.5	14.8	23.7	11.9%
R7	200	7.2	7.4	7.0	7.8	8.9	8.9	4.5	14.8	23.7	11.9%
R8	200	9.2	8.0	9.0	10.1	10.1	10.1	5.1	14.8	24.9	12.5%
R9	200	11.1	9.4	10.0	10.8	10.2	11.1	5.6	14.8	25.9	13.0%
R10	200	7.8	8.4	9.7	9.4	8.9	9.7	4.9	14.8	24.5	12.3%
R11	200	7.3	8.2	9.6	9.8	8.4	9.8	4.9	14.8	24.6	12.3%
R12	200	9.9	9.6	9.3	10.0	9.2	10.0	5.0	14.8	24.8	12.4%
R13	200	8.2	8.5	11.3	9.4	7.6	11.3	5.7	14.8	26.1	13.1%
R14	200	4.3	4.3	6.3	4.4	4.2	6.3	3.2	14.8	21.1	10.6%
R15	200	4.6	5.8	7.0	5.9	5.1	7.0	3.5	14.8	21.8	10.9%

The results presented in Table 7.30 show that predicted concentrations of 99.79th percentile 1-hour mean NO₂ are low at human receptors. The maximum PC at any human health receptor location (R3) is 26.1 µg/m³, which is 13.1% of the EAL. The maximum PEC at any human receptor location (also R3) is 40.9 µg/m³, which is 20.5% of the EAL.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on

significance¹¹, all PCs are less than 20% of the Environmental Assessment Level minus the short-term background, under those criteria, would be considered not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the short-term PC. The largest predicted PC of 1-hour mean NO₂, as presented in Table 7.30, is 13.1% of the EAL, and with the PEC 20.5% of the EAL, the impact can be described as moderate at the most affected receptor. As the PEC is considerably smaller than the EAL, the impact of 1-hour NO₂ at human receptors is therefore not significant.

Table 7.31 shows the predicted concentrations of 99.18th percentile 24-hour mean SO₂ at human receptors in the cumulative development scenario.

Table 7.31: Modelled 99.18th Percentile 24-Hour Mean SO₂ Emissions at Human Health Receptor Locations – Cumulative Developments

Receptor ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/EAL (%)
		2017	2018	2019	2020	2021					
R1	125	10.3	5.5	10.6	12.2	6.6	12.2	9.8	10.0	22.2	17.8%
R2	125	12.6	5.9	11.3	12.9	8.3	12.9	10.3	10.0	22.9	18.3%
R3	125	16.2	7.3	11.8	11.8	10.8	16.2	13.0	10.0	26.2	21.0%
R4	125	17.1	7.7	11.5	11.4	12.6	17.1	13.7	10.0	27.1	21.7%
R5	125	4.4	3.7	3.9	4.7	4.0	4.7	3.8	10.0	14.7	11.8%
R6	125	3.9	4.4	3.3	3.4	4.6	4.6	3.7	10.0	14.6	11.7%
R7	125	3.7	3.0	3.0	3.5	4.4	4.4	3.5	10.0	14.4	11.5%
R8	125	4.4	3.6	4.2	4.1	4.4	4.4	3.5	10.0	14.4	11.5%
R9	125	3.8	3.3	3.9	4.3	3.2	4.3	3.4	10.0	14.3	11.4%
R10	125	4.7	3.8	4.0	4.0	4.0	4.7	3.8	10.0	14.7	11.8%
R11	125	4.4	3.9	4.5	4.3	4.0	4.5	3.6	10.0	14.5	11.6%
R12	125	5.6	6.1	5.4	6.7	3.7	6.7	5.4	10.0	16.7	13.4%
R13	125	4.3	5.1	5.2	5.9	3.2	5.9	4.7	10.0	15.9	12.7%
R14	125	1.7	2.2	3.8	2.1	1.8	3.8	3.0	10.0	13.8	11.0%
R15	125	2.1	2.1	2.7	2.2	2.9	2.9	2.3	10.0	12.9	10.3%

The results presented in Table 7.31 show that predicted concentrations of 99.18th percentile 24-hour mean SO₂ are low at human receptors. The maximum PC at any human receptor location (R4) is 17.1µg/m³, which is 13.7% of the EAL. The maximum PEC at any human receptor location (also R4) is 26.2µg/m³, which is 21.0% of the EAL.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, all PCs are less than 20% of the Environmental Assessment Level minus the short-term background, under those criteria, would be considered not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the short-term PC. The largest predicted PC of 24-hour mean SO₂, as presented in Table 7.31, is 13.7% of the EAL (R11), and with the PEC 21.0% of the EAL, the impact can be described as moderate at the most affected receptor. As the PEC is considerably smaller than the EAL, the impact of 24-hour SO₂ at human receptors is therefore not significant.

Table 7.32 shows predicted concentrations of 99.73rd percentile of 1-hour mean SO₂ at human receptor locations in the cumulative development scenario.

Table 7.32: Modelled 99.73rd Percentile 1-Hour Maximum SO₂ Emissions at Human Health Receptor Locations – Cumulative Developments

Receptor ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/EAL (%)
		2017	2018	2019	2020	2021					
R1	350	32.1	25.4	36.3	34.3	28.3	36.3	10.4	10.0	46.3	13.2%
R2	350	36.5	26.7	39.1	36.8	29.8	39.1	11.2	10.0	49.1	14.0%
R3	350	39.8	28.7	40.2	37.2	31.1	40.2	11.5	10.0	50.2	14.3%
R4	350	35.8	29.2	36.0	32.9	32.5	36.0	10.3	10.0	46.0	13.1%
R5	350	15.8	14.0	16.7	16.7	16.1	16.7	4.8	10.0	26.7	7.6%
R6	350	14.3	14.0	14.2	13.8	16.0	16.0	4.6	10.0	26.0	7.4%
R7	350	13.6	13.8	13.0	13.3	16.2	16.2	4.6	10.0	26.2	7.5%
R8	350	17.0	13.8	15.9	15.1	18.2	18.2	5.2	10.0	28.2	8.1%
R9	350	19.7	15.8	16.7	18.1	16.7	19.7	5.6	10.0	29.7	8.5%
R10	350	14.1	14.8	16.4	15.4	16.0	16.4	4.7	10.0	26.4	7.5%
R11	350	14.0	14.4	17.2	16.2	15.1	17.2	4.9	10.0	27.2	7.8%
R12	350	19.4	17.8	18.1	19.2	17.8	19.4	5.5	10.0	29.4	8.4%
R13	350	15.9	16.1	21.4	16.8	14.8	21.4	6.1	10.0	31.4	9.0%
R14	350	6.5	6.4	10.9	6.7	7.1	10.9	3.1	10.0	20.9	6.0%
R15	350	6.3	10.5	12.4	10.5	8.6	12.4	3.5	10.0	22.4	6.4%

The results presented in Table 7.32 show that predicted concentrations of 99.73rd percentile 1-hour mean SO₂ are generally low at human receptors. The maximum PC at any human receptor location (R3) is 40.2µg/m³, which is 11.5% of the EAL. The maximum PEC at any human receptor location (also R3) is 50.2µg/m³, which is 14.3% of the EAL.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, all PCs are less than 20% of the Environmental Assessment Level minus the short-term background, under those criteria, would be considered not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors

as a product of change in concentration (PC), with consideration to the short-term PC. The largest predicted PC of 1-hour mean SO₂, as presented in Table 7.32, is 11.5% of the EAL, and with the PEC 14.3% of the EAL, the impact can be described as moderate at the most affected receptor. As the PEC is considerably smaller than the EAL, the impact of 1-hour SO₂ at human receptors is therefore not significant.

Table 7.33 shows predicted concentrations of maximum 8-hour mean CO at human receptors in the cumulative development scenario.

Table 7.33: Modelled Maximum 8-Hour Mean CO Emissions at Human Health Receptor Locations – Cumulative Developments

Receptor ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/EAL (%)
		2017	2018	2019	2020	2021					
R1	10,000	27.5	17.6	38.4	39.4	24.5	39.4	0.4	0.8	40.2	0.4%
R2	10,000	36.0	22.1	48.2	48.8	29.8	48.8	0.5	0.8	49.6	0.5%
R3	10,000	55.3	24.1	51.0	50.9	40.7	55.3	0.6	0.8	56.1	0.6%
R4	10,000	52.5	30.2	40.8	36.4	43.5	52.5	0.5	0.8	53.3	0.5%
R5	10,000	16.8	11.5	18.2	17.8	14.9	18.2	0.2	0.8	19.0	0.2%
R6	10,000	17.1	17.0	15.5	16.7	17.2	17.2	0.2	0.8	18.0	0.2%
R7	10,000	8.9	8.8	10.4	12.1	8.3	12.1	0.1	0.8	12.9	0.1%
R8	10,000	17.1	13.8	12.3	18.7	12.1	18.7	0.2	0.8	19.5	0.2%
R9	10,000	10.8	9.8	11.8	13.5	8.8	13.5	0.1	0.8	14.3	0.1%
R10	10,000	14.3	14.8	13.2	15.2	12.6	15.2	0.2	0.8	16.0	0.2%
R11	10,000	16.4	17.4	16.9	16.3	12.4	17.4	0.2	0.8	18.2	0.2%
R12	10,000	8.9	7.2	5.6	8.4	8.9	8.9	0.1	0.8	9.7	0.1%
R13	10,000	13.6	14.6	11.2	11.7	12.3	14.6	0.1	0.8	15.4	0.2%
R14	10,000	8.3	6.8	8.7	8.4	7.7	8.7	0.1	0.8	9.5	0.1%
R15	10,000	7.5	3.8	7.9	8.8	7.6	8.8	0.1	0.8	9.6	0.1%

The results presented in Table 7.33 show that predicted concentrations of maximum 8-hour mean CO are low at human receptors. The maximum PC at any human receptor location (R3) is 55.3µg/m³, which is 0.6% of the EAL. The maximum PEC at any human receptor location (also R3) is 56.1µg/m³, which is 0.6% of the EAL.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, all PCs are less than 10% of the EAL and, under those criteria, would be considered not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the short-term PC. The largest predicted PC of maximum 8-hour CO, as presented in Table 7.33, is 0.6% of the EAL, and with the PEC

0.6% of the EAL, the impact can be described as imperceptible for all receptors. The impact of maximum 8-hour CO at human receptors is therefore not significant.

Table 7.34 shows predicted concentrations of annual mean PM₁₀ at human receptors in the cumulative development scenario.

Table 7.34: Modelled Annual Mean PM₁₀ Emissions at Human Health Receptor Locations – Cumulative Developments

Receptor ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/EAL (%)
		2017	2018	2019	2020	2021					
R1	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R2	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R3	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R4	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R5	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R6	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R7	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R8	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R9	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R10	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R11	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R12	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R13	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R14	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%
R15	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12.7	12.7	31.8%

The results presented in Table 7.34 show that predicted concentrations of annual mean PM₁₀ are low at human receptors. The maximum PC at any human receptor location is less than 0.1µg/m³, which is less than 0.1% of the EAL. The maximum PEC at any human receptor location is 12.7µg/m³, which is 31.8% of the EAL.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, all PCs are less than 1% of the EAL and, under those criteria, would be considered not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the long-term total concentration of pollutants (PEC). The largest predicted PC of annual mean PM₁₀, as presented in Table 7.34, is less than 0.1% of the EAL, and with the PEC 31.8% of the EAL, the impact can be described as imperceptible all receptors. The impact of annual mean PM₁₀ at human receptors is therefore not significant.

Table 7.35 shows predicted concentrations of 90.41st percentile 24-hour mean PM₁₀.

Table 7.35: Modelled 90.41st Percentile 24-Hour Mean PM₁₀ Emissions at Human Health Receptor Locations – Cumulative Developments

Receptor ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/EAL (%)
		2017	2018	2019	2020	2021					
R1	50	0.4	0.2	0.4	0.3	0.2	0.4	0.8	25.4	25.8	51.6%
R2	50	0.4	0.2	0.5	0.3	0.3	0.5	1.0	25.4	25.9	51.8%
R3	50	0.7	0.3	0.6	0.4	0.3	0.7	1.4	25.4	26.1	52.2%
R4	50	0.8	0.4	0.9	0.6	0.5	0.9	1.8	25.4	26.3	52.6%
R5	50	<0.1	0.1	0.1	0.1	<0.1	0.1	0.2	25.4	25.5	51.0%
R6	50	<0.1	0.2	0.1	0.1	0.1	0.2	0.4	25.4	25.6	51.2%
R7	50	<0.1	0.1	0.1	0.1	<0.1	0.1	0.2	25.4	25.5	51.0%
R8	50	0.1	0.1	0.1	0.1	0.1	0.1	0.2	25.4	25.5	51.0%
R9	50	0.1	0.1	0.1	0.1	0.1	0.1	0.2	25.4	25.5	51.0%
R10	50	0.6	0.5	0.6	0.6	0.3	0.6	1.2	25.4	26.0	52.0%
R11	50	0.5	0.4	0.4	0.4	0.2	0.5	1.0	25.4	25.9	51.8%
R12	50	0.3	0.3	0.2	0.2	0.3	0.3	0.6	25.4	25.7	51.4%
R13	50	0.1	0.1	0.1	0.2	0.1	0.2	0.4	25.4	25.6	51.2%
R14	50	0.2	0.2	0.2	0.2	0.2	0.2	0.4	25.4	25.6	51.2%
R15	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	25.4	25.4	50.8%

The results presented in Table 7.35 show that predicted concentrations of 90.41st percentile 24-hour mean PM₁₀ are low at human receptors. The maximum PC at any human receptor location (R4) is 0.9µg/m³, which is 1.8% of the EAL. The maximum PEC at any human receptor location (also R4) is 26.3µg/m³, which is 52.6% of the EAL.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, all PCs are less than 10% of the EAL and, under those criteria, would be considered not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the short-term PC. The largest predicted PC of 24-hour mean PM₁₀, as presented in Table 7.35, is 1.8% of the EAL, and with the PEC 52.6% of the EAL, the impact can be described as imperceptible for all receptors. The impact of 24-hour mean PM₁₀ at human receptors is therefore not significant.

Table 7.36 shows predicted concentrations of annual mean PM_{2.5} at human receptors in the cumulative development scenario.

Table 7.36: Modelled Annual Mean PM_{2.5} Emissions at Human Health Receptor Locations – Cumulative Developments

Receptor ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/EAL (%)
		2017	2018	2019	2020	2021					
R1	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R2	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R3	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R4	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R5	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R6	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R7	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R8	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R9	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R10	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R11	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R12	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R13	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R14	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%
R15	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8.4	8.4	42.0%

The results presented in Table 7.36 show that predicted concentrations of annual mean PM_{2.5} are low at human receptors. The maximum PC at any human receptor location (R4) is less than 0.1 µg/m³, which is less than 0.1% of the EAL. The maximum PEC at any human receptor location (also R4) is 8.4 µg/m³, which is 42.0% of the EAL.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, all PCs are less than 1% of the EAL and, under those criteria, would be considered not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the long-term total concentration of pollutants (PEC). The largest predicted PC of annual mean PM₁₀, as presented in Table 7.36, is less than 0.1% of the EAL, and with the PEC 42.0% of the EAL, the impact can be described as imperceptible at all receptors. The impact of annual mean PM_{2.5} at human receptors is therefore not significant.

Table 7.37 shows predicted concentrations of annual mean NO_x at ecological receptors in the cumulative developments' scenario.

Table 7.37: Modelled Annual Mean NO_x Emissions at Ecological Receptor Locations – Cumulative Developments

Receptor ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/ EAL (%)
		2017	2018	2019	2020	2021					
E1a	30	0.2	0.1	0.3	0.2	0.2	0.3	1.0	14.0	14.3	47.7%
E1b	30	0.3	0.2	0.3	0.3	0.2	0.3	1.0	14.0	14.3	47.7%
E1c	30	0.4	0.3	0.5	0.4	0.3	0.5	1.7	14.0	14.5	48.3%
E2a	30	0.2	0.2	0.2	0.2	0.2	0.2	0.7	14.0	14.2	47.3%
E2b	30	0.2	0.2	0.2	0.2	0.2	0.2	0.7	14.0	14.2	47.3%
E2c	30	0.2	0.2	0.2	0.2	0.2	0.2	0.7	14.0	14.2	47.3%
E2d	30	0.2	0.3	0.3	0.2	0.3	0.3	1.0	14.0	14.3	47.7%
E2e	30	0.6	0.5	0.6	0.6	0.4	0.6	2.0	14.0	14.6	48.7%
E2f	30	0.2	0.2	0.3	0.2	0.2	0.3	1.0	14.0	14.3	47.7%
E2g	30	0.2	0.3	0.3	0.2	0.3	0.3	1.0	14.0	14.3	47.7%
E2h	30	0.1	0.1	0.1	0.1	0.1	0.1	0.3	14.0	14.1	47.0%
E2i	30	0.2	0.3	0.4	0.2	0.3	0.4	1.3	14.0	14.4	48.0%
E2j	30	0.1	0.1	0.1	0.1	0.1	0.1	0.3	14.0	14.1	47.0%
E3	30	0.2	0.1	0.1	0.2	0.2	0.2	0.7	14.0	14.2	47.3%
E4	30	<0.1	0.1	<0.1	0.1	<0.1	0.1	0.3	14.0	14.1	47.0%

The results presented in Table 7.37 show that predicted concentrations of annual mean NO_x are low at ecological receptors. The maximum PC at any ecological receptor location (E2e) is 0.6µg/m³, which is 2.0% of the EAL. The maximum PEC at any ecological receptor location (also E2e) is 14.6µg/m³, which is 48.7% of the EAL.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, the PEC at all ecological receptors is less than 70% and can be screened out as not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the long-term total concentration of pollutants (PEC). The largest predicted PC of NO_x, as presented in Table 7.37, is 2.0% of the EAL, and with the PEC 48.7% of the EAL, the impact can be described as imperceptible at all receptors. The impact of annual mean NO_x at ecological receptors is therefore not significant.

Table 7.38 shows predicted concentrations of annual mean SO₂ at ecological receptors in the cumulative development scenario.

Table 7.38: Modelled Annual Mean SO₂ Emissions at Ecological Receptor Locations – Cumulative Developments

Receptor ID	EAL (µg/m ³)	PC (µg/m ³)					Max PC (µg/m ³)	PC/EAL (%)	BC (µg/m ³)	PEC (µg/m ³)	PEC/EAL (%)
		2017	2018	2019	2020	2021					
E1a	20	0.2	0.1	0.3	0.2	0.2	0.3	1.5	5.0	5.3	26.5%
E1b	20	0.3	0.2	0.3	0.3	0.2	0.3	1.5	5.0	5.3	26.5%
E1c	20	0.4	0.3	0.4	0.4	0.3	0.4	2.0	5.0	5.4	27.0%
E2a	20	0.2	0.2	0.2	0.2	0.2	0.2	1.0	5.0	5.2	26.0%
E2b	20	0.2	0.2	0.2	0.2	0.2	0.2	1.0	5.0	5.2	26.0%
E2c	20	0.2	0.2	0.2	0.2	0.2	0.2	1.0	5.0	5.2	26.0%
E2d	20	0.2	0.2	0.3	0.2	0.2	0.3	1.5	5.0	5.3	26.5%
E2e	20	0.6	0.5	0.6	0.6	0.4	0.6	3.0	5.0	5.6	28.0%
E2f	20	0.2	0.2	0.2	0.2	0.2	0.2	1.0	5.0	5.2	26.0%
E2g	20	0.2	0.3	0.3	0.2	0.3	0.3	1.5	5.0	5.3	26.5%
E2h	20	0.1	0.1	0.1	0.1	0.1	0.1	0.5	5.0	5.1	25.5%
E2i	20	0.2	0.3	0.4	0.2	0.3	0.4	2.0	5.0	5.4	27.0%
E2j	20	0.1	0.1	0.1	0.1	0.1	0.1	0.5	5.0	5.1	25.5%
E3	20	0.2	0.1	0.1	0.1	0.2	0.2	1.0	5.0	5.2	26.0%
E4	20	<0.1	<0.1	<0.1	0.1	<0.1	0.1	0.5	5.0	5.1	25.5%

The results presented in Table 7.38 show that predicted concentrations of annual mean SO₂ are low at ecological receptors. The maximum PC at any ecological receptor location (E2e) is 0.6µg/m³, which is 3.0% of the EAL. The maximum PEC at any ecological receptor location (also E2e) is 5.6µg/m³, which is 28.0% of the EAL.

Within the context of EPA guidance on maximum allowable PC₁₀ (Maximum Allowable PC = 0.75*AQS), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, the PEC at all ecological receptors is less than 70% and can be screened out as not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the long-term total concentration of pollutants (PEC). The largest predicted PC of annual mean SO₂, as presented in Table 7.38, is 3.0% of the EAL, and with the PEC 28.0% of the EAL, the impact can be described as imperceptible at all receptors. The impact of annual mean SO₂ at ecological receptors is therefore not significant.

Table 7.39 shows predicted concentrations of annual nitrogen deposition at ecological receptors in the cumulative development scenario.

Table 7.39: Modelled Annual Nitrogen Deposition at Ecological Receptor Locations – Cumulative Developments

Receptor ID	EAL (kg/ha/yr)	Max PC ($\mu\text{g}/\text{m}^3$)		Total N Dep (kg/ha/yr)	PC/EAL (%)	BC (kg/ha/yr)	PEC (kg/ha/yr)	PEC/EAL (%)
		NO _x	NH ₃					
E1a	5	0.3	<0.001	0.04	0.7	3.98	4.02	80.3
E1b	5	0.3	<0.001	0.04	0.9	3.98	4.02	80.5
E1c	5	0.5	<0.001	0.07	1.3	3.98	4.05	80.9
E2a	5	0.2	<0.001	0.03	0.6	5.16	5.19	103.8
E2b	5	0.2	<0.001	0.03	0.6	5.16	5.19	103.8
E2c	5	0.2	<0.001	0.03	0.6	5.16	5.19	103.8
E2d	5	0.3	0.002	0.04	0.8	3.86	3.90	78.0
E2e	5	0.6	0.002	0.09	1.8	3.91	4.00	80.0
E2f	5	0.3	<0.001	0.04	0.7	3.98	4.02	80.3
E2g	5	0.3	0.002	0.04	0.9	3.28	3.32	66.5
E2h	5	0.1	0.001	0.01	0.2	3.45	3.46	69.2
E2i	5	0.4	0.002	0.06	1.1	4.14	4.20	83.9
E2j	5	0.1	<0.001	0.02	0.3	5.02	5.04	100.7
E3	10	0.2	0.002	0.03	0.3	5.02	5.05	50.5
E4	5	0.1	0.001	0.01	0.2	5.00	5.01	100.2

The results presented in Table 7.39 show that predicted concentrations of annual nitrogen deposition are low at ecological receptors. The maximum PC at any ecological receptor location (E2e) is 0.09 kg/ha/year, which is 1.8% of the EAL. The maximum PEC at any ecological receptor location (E2a, E2b and E2c) is 5.19 kg/ha/year, which is 103.8% of the EAL. The table shows that there is a high background contribution of nitrogen deposition at all receptor locations, the predicted PC, by comparison, is very small.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = $0.75 \times (\text{AQS} - \text{BC})$ where there is a significant background concentration), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, the impacts of nitrogen deposition cannot be screened out as not significant at ecological receptors E1c, E2e and E2i as the PC is greater than 1% with the PEC greater than 70%. At all receptors, including E1c, E2e and E2i, it is, however, predicted that there will be no new exceedances as a result of the Proposed Development, on that basis the development can likely be considered not significant.

The final method for determining significance set out in Section 7.3.4 is from the professional guidance published by IAQM and EPUK¹². As presented in Section 7.3.4 this guidance sets out impact descriptors as a product of change in concentration (PC), with consideration to the long-term total concentration of pollutants (PEC). The largest predicted PC of annual mean deposited nitrogen, as presented in Table 7.39, is 1.8% of the EAL, the impact can be described as imperceptible for all receptors. The impact of annual mean deposited nitrogen at ecological receptors is therefore not significant.

Using the significance criteria described in Section 7.3.4 of this document, the impact of nitrogen deposition is predicted to be not significant.

This assessment offers a conservative prediction of the air pollution climate in the vicinity of the site. It is important to acknowledge that the reason PEC of nitrogen deposition as shown in Table 7.39 is high is because of the existing background concentrations. These background concentrations are likely to comprise existing sources of pollutants, such as Moneypoint Power station, which is modelled in this assessment, we are therefore likely to be double counting this contribution in the calculated PEC. The Tarbert HFO Power Station, which expected to be decommissioned by the time the Proposed Development is operational, is also likely to be a contributor to the background nitrogen deposition concentrations used in this assessment.

Table 7.40 shows predicted concentrations of annual acid deposition at ecological receptors in the cumulative development scenario.

Table 7.40: Modelled Annual Acid Deposition at Ecological Receptor Locations – Cumulative Developments

Receptor ID	EAL (keq/ha/yr)			Max PC (keq/ha/yr)		PC/EAL (%)	BC (keq/ha/yr)		PEC/ EAL (%)
	MinCLminN	MinCLMaxN	MinCLMaxS	N	S		N	S	
E1a	0.071	0.375	0.303	0.003	0.030	8.8	0.06	0.28	99.5
E1b	0.071	0.375	0.303	0.003	0.033	9.6	0.06	0.28	100.3
E1c	0.071	0.375	0.303	0.005	0.050	14.7	0.06	0.28	105.3
E2a	0.071	0.375	0.303	0.002	0.023	6.7	0.05	0.37	118.7
E2b	0.071	0.375	0.303	0.002	0.023	6.7	0.05	0.37	118.7
E2c	0.071	0.375	0.303	0.002	0.023	6.7	0.05	0.37	118.7
E2d	0.071	0.375	0.303	0.003	0.030	8.8	0.05	0.28	96.8
E2e	0.071	0.375	0.303	0.006	0.072	20.8	0.07	0.28	114.1
E2f	0.071	0.311	0.24	0.003	0.029	10.3	0.06	0.28	119.6
E2g	0.071	0.311	0.24	0.003	0.034	11.9	0.04	0.23	98.7
E2h	0.071	0.311	0.24	0.001	0.008	2.9	0.04	0.25	96.1
E2i	0.071	0.311	0.24	0.004	0.044	15.4	0.06	0.30	131.2
E2j	0.071	0.311	0.24	0.001	0.014	4.8	0.04	0.36	133.4
E3	0.143	0.509	0.366	0.002	0.021	4.5	0.05	0.36	85.1
E4	0.143	0.46	0.317	0.001	0.007	1.7	0.04	0.36	88.7

The results presented in Table 7.40 show that predicted concentrations of annual acid deposition are generally low at ecological receptors. The maximum cumulative PC at any ecological receptor location (E1e) is 20.8% of the EAL. The maximum PEC at any ecological receptor (E2j) is 133.4% of the EAL. The table shows that there is a high background contribution of acid deposition at all receptor locations, the predicted PC, by comparison, is very small.

Within the context of EPA guidance on maximum allowable PC¹⁰ (Maximum Allowable PC = $0.75 \times (\text{AQS} - \text{BC})$ where there is a significant background concentration), all predicted results are considerably within the allowable range. In the context of UK EA guidance on significance¹¹, the impacts of acid deposition cannot be screened out as not significant at any ecological receptors. As highlighted in the previous paragraphs, the assessment is highly conservative and includes the input of existing installations in the model and in the background concentrations of pollutants, including deposited acid. This means that there is some double counting of pollutant input. The background pollutant concentrations in this assessment are also likely to include a not inconsiderable input from Moneypoint and from the Tarbert HFO Power Station which will be decommissioned by the time the Proposed Development is operational. The overall impact is likely to be considerably smaller than presented in these tables.

7.8 Summary

A dispersion modelling assessment has been undertaken on emissions associated with the construction and operation of the proposed OCGT, operating up to 1800 hours per year on air quality sensitive SAC and SPA habitats and selected human health receptors within 15km.

The air quality assessment of construction impacts assumes that the impact avoidance measures outlined within Section 7.5 will be incorporated into the CEMP for the Proposed Development, as they are standard good practice measures that are routinely applied across large construction sites. No specific additional mitigation has been identified as necessary for the construction phase of the Proposed Development. No significant effects have been identified.

For human health receptors during the operation phase, the assessment has determined that the impact of the Proposed Development Scenario and subsequent total pollutant concentrations (PEC) does not result in a significant effect on local air quality. The assessment has identified several incidences of moderate impacts at human receptors in both the Proposed Development Scenario and the Cumulative Developments Scenario. This, however, does not indicate a significant impact, owed to the good overall air quality at in the vicinity of the Site.

In a similar manner, the impacts at ecological sites in both scenarios are unlikely to be significant. It is predicted that the PCs (process contributions of modelled emissions only) from the Proposed Development Scenario are all <0.1% of the Environmental Assessment Level. The higher PCs in the cumulative scenario are likely to be due to unavoidable double counting of contributions from Moneypoint and the contribution of the Tarbert HFO Power Station in the background, as described in the previous sections. This assessment has therefore shown to represent a conservative approach to modelling the Proposed Development.

7.9 References

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- ² EPA (2020). Dispersion Modelling from Industrial Installations Guidance Note (AG4).
- ³ APIS (2016). Hosted & Maintained by UK Centre for Ecology and Hydrology. www.apis.ac.uk
- ⁴ Government of Ireland (2018). National Planning Framework.
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- ⁷ IAQM (2014) IAQM Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London, Updated 2016, <https://iaqm.co.uk/text/guidance/construction-dust-2014.pdf>
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- ⁹ EPA (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports.
- ¹⁰ UK EA (2016). Air Emissions Risk Assessment for your Environmental Permit Guidance – Updated 2022.
- ¹¹ IAQM and EPUK (2017). Land-Use Planning and Development Control: Planning for Air Quality.
- ¹² Development of Critical Loads for Ireland: Simulating Impacts on Systems (SIOS) Author: Julian Aherne, Jason Henry and Marta Wolniewicz.

SSE Tarbert Next Generation Power Station

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Table of Contents

8.	Cultural Heritage	8-1
8.1	Introduction	8-1
8.2	Legislation, Policy and Guidance	8-1
8.3	Methodology	8-8
8.4	Baseline Environment.....	8-17
8.5	Impact Assessment Methodology	8-23
8.6	Potential Impacts	8-25
8.7	Mitigation Measures	8-30
8.8	Residual Impacts	8-31
8.9	Cumulative Impacts	8-31
8.10	Summary	8-33
8.11	References	8-35

Tables

Table 8.1: Factors Determining the Value of Heritage Asset	8-13
Table 8.2: Factors Determining the Magnitude of Impact	8-16
Table 8.3: Significance of Effect Matrix	8-16

Appendices

(Refer to EIAR Volume II)

Appendix 8A: Gazetteers

Appendix 8B: Site Photographs

Figures

(Refer to EIAR Volume III)

Figure 8.1: Cultural Heritage Assets within 1km Study Area and wider 3km Settings Assessment Area

8. Cultural Heritage

8.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) describes and assesses the likely significant effects from the Proposed Development upon the cultural heritage, archaeological and architectural environment.

This chapter of the EIAR:

- defines the study area focussing on heritage in the vicinity of the Proposed Development which could be impacted by the proposed works;
- the methodology used for developing the baseline and impact assessment;
- provides a description of the baseline environment in relation to heritage; and
- presents the findings of the impact assessment.

The application Site boundary ('red line boundary') is enclosed within the SSE Tarbert site ('SSE Tarbert') which is mostly under the management of the Applicant (refer to Figure 1.1, EIAR Volume III).

Full details on the background and Site history are provided in Chapter 4 (Existing Site and Conditions) and details of the Proposed Development are presented in Chapter 5 (Description of the Proposed Development) and the Planning Statement submitted with this planning application.

8.2 Legislation, Policy and Guidance

This chapter has been prepared and assessment undertaken in accordance with all relevant legislation, policies and guidelines. The documents utilised in the preparation of this study include:

- National Monuments Act 1930 (as amended);
- Record of Monuments and Places (RMP) established under Section 12 of the National Monuments (amendment) Act 1994;
- Planning and Development Act 2000 (as amended);
- Heritage Act 1995; Architectural Heritage (national inventory);
- Historic Monuments (miscellaneous provisions) Act 1999;
- Kerry County Development Plan (Kerry CDP) 2022-2028;
- Clare County Development Plan (Clare CDP) 2023-2029;
- Limerick County Development Plan (Limerick CDP) 2022-2028;
- Department of Arts, Heritage and the Gaeltacht (1999a) Frameworks and Principles for the Protection of the Archaeological Heritage; and
- Department of Arts, Heritage and the Gaeltacht (2004) (revised 2011). *Architectural Heritage Guidelines for Planning Authorities*.

The Historic and Archaeological Heritage and Miscellaneous Provisions Bill 2023 was published in January 2023 and reached Dáil Final on the 27 September 2023 (House of the Oireachtas, 2023). The Bill will repeal the National Monuments Acts 1930 to 2014 and replace those Acts with new provisions for heritage protection. It will modernise historic and archaeological heritage legislation, providing for a single integrated licencing system and statutory codes of practice. It will confer legal protections on new finds of archaeological sites and set out a civil enforcement system to be used as an alternative to, or to supplement criminal proceedings. It will also provide for the State to ratify some key international conventions in the area of heritage protection. In particular, it will give effect to the EIA directive in relation to the carrying out of works at, on, in, under, to or within the immediate surroundings of monuments. Sections dealing with EIAR in regard to monuments are contained in Part 2 Chapter 6 while EIAR in relation to the issuing of guidelines and matters relating to Historic Heritage can be found in Part 9. Both sections were considered in the preparation of this chapter.

8.2.1 Local Policy Framework

Although the SSE Tarbert Site is located in Kerry County Council (KCC) only, the wider 3km study area (refer to Figure 8.1, EIAR Volume III) around the Proposed Development extends into Counties Clare and Limerick. Given this, the County Development Plans associated with Kerry, Clare and Limerick are noted within this assessment.

8.2.1.1 Kerry County Development Plan 2022 – 2028

Local planning policy that applies to the Proposed Development site are contained within the Kerry County Development Plan 2022 – 2028 ('Kerry CDP'). There are a large number of strategic objectives providing a framework for development which may affect heritage assets. These are laid out in chapter 8 of the Kerry CDP and deal with both archaeological and architectural heritage. Those archaeological strategic objectives most pertinent to the Proposed Development are as follows:

- **KCDP 8-24:** (i) Secure the preservation in situ of all sites, features, protected wrecks and objects of archaeological interest within the county. In securing such preservation the Council will have regard to the advice and recommendations of the National Monuments Service, Department of Housing, Local Government and Heritage, the National Museum of Ireland, and the County Archaeologist.
- (ii) Ensure that proposed development (due to location, size, or nature) which may have implications for the archaeological heritage of the county will be subject to an Archaeological Assessment (including Underwater Archaeological Impact Assessment) which may lead to further subsequent archaeological mitigation – buffer zones/exclusion zones, monitoring, pre-development archaeological testing, archaeological excavation and/or refusal of planning permission. This includes areas close to archaeological monuments, development sites which are extensive in area (half hectare or more) or length (1km or more) or include potential impacts on underwater cultural heritage and development that requires an Environmental Impact Assessment.
- **KCDP 8-25** Ensure the protection and preservation of archaeological monuments, wrecks and features, not yet listed in the Record of Monuments & Places (RMP), Sites & Monuments

Record (SMR) or Wreck Inventory of Ireland Database and such unrecorded, through on-going review of the archaeological potential of the plan area. In securing such protection the council will have regard to the advice and recommendations of The National Monuments Service, Department of Housing, Local Government and Heritage, and the County Archaeologist.

- **KCDP 8-26** Protect and preserve and promote the underwater archaeological heritage of the county. In assessing proposals for development, the Council will take account of the Archaeological Potential of rivers, lakes, intertidal and sub-tidal environments. Where flood relief schemes are being undertaken the Council will have regard to the Archaeological Guidelines for Flood Relief Schemes (DHLGH and OPW 2021).
- **KCDP 8-27** Ensure that development (including forestry, renewable energy developments and extractive industries) within the vicinity of a recorded monument, zone of archaeological potential or archaeological landscape does not detract from the setting of the feature and is sited and designed appropriately and sympathetically with the character of the monument/feature/landscape and its setting.
- **KCDP 8-30** Protect and preserve the industrial, military, maritime, riverine, lacustrine and post-medieval archaeological heritage of the county as reflected in such sites as mills, lighthouses, harbours, Valentia cable station, gun batteries, towers, and demesnes. Proposals for refurbishment, works to or redevelopment of these sites should be subject to a full architectural and archaeological assessment including, where appropriate, Underwater Archaeological Impact Assessment.
- **KCDP 8-33** Continue to research and record the archaeological heritage of the county and to promote the timely public access to the results of archaeological research and excavation.

The architectural strategic objectives most pertinent to this project are as follows:

- **KCDP 8-38** Seek the retention and appropriate repair and upgrading of historic, buildings, structures, road bridges, railway bridges and tunnels throughout the county, subject to environmental assessment.

Record of Protected Structures

- **KCDP 8-40** Ensure that any development, modification, alteration, or extension affecting a protected structure and/or its setting including designed landscape features and views, is compatible with the special character of that structure.

Architectural Conservation Areas (ACA)

- **KCDP 8-44** Ensure developments in an ACA have a positive impact on the intrinsic character of the area, respect the existing streetscape and layout, and are compatible in terms of design, materials, traffic, views, and intensity of site use.

The strategic objectives relating to Historic Landscapes most pertinent to this project are as follows:

- **KCDP 8-49** Carry out further research and analysis to identify, survey and promote the conservation of historic landscapes in Kerry.

- **KCDP 8-50** Require that proposals for development within historic designed landscapes be sensitive to and respect the built heritage elements and green space values of the site.

8.2.1.2 Clare County Development Plan 2023 – 2029

Local policy is provided in chapter 16 of the Clare County Development Plan 2023 – 2029 (Clare CDP). Clare CDP presents the objectives required to protect the architectural, archaeological, and cultural heritage of the County. In accordance with the overall vision of the Clare CDP, it is based on the following strategic aims:

- To protect and enhance the character of the built environment by means of the Record of Protected Structures and Architectural Conservation Areas.
- To enhance present and future environments by protecting the architectural heritage of the County and successfully integrating new development.
- To protect the archaeology resource in the County for both its intrinsic and tourism value.
- To promote and support cultural activities, facilities and services in County Clare: and
- To protect and enhance the vernacular-built environment across the county.

Heritage is protected through a range of Development Plan Objectives, only those applicable to the Proposed Development are outlined. Architectural heritage is protected through the following Clare CDP Objective:

- **CDP 16.1:** Development Plan Objective: Architectural Heritage

It is an objective of Clare County Council:

- a) To ensure the protection of the architectural heritage of County Clare through the identification of Protected Structures, the designation of Architectural Conservation Areas, the safeguarding of historic gardens, and the recognition of structures and elements that contribute positively to the vernacular and industrial heritage of the County.
- b) To ensure that the architectural heritage of the County is not damaged either through direct destruction or by unsympathetic developments nearby; and
- c) To support and promote architectural vernacular skills training and facilities in the county.

Protected Structures are protected through the following Clare CDP Objective:

- **CDP16.2:** Development Plan Objective: Protected Structures

It is an objective of Clare County Council:

- a) To protect, as set out in the Record of Protected Structures, all structures, and their settings, which are of special architectural, historical, archaeological, artistic, cultural, scientific, social, or technical interest; and
- b) To review the Record of Protected Structures periodically and add structures of special interest as appropriate, including significant elements of industrial, maritime, or vernacular heritage and any twentieth century structures of merit.

Architectural Conservation Areas are protected through the following Clare CDP Objective:

- **CDP16.5:** Development Plan Objective: Architectural Conservation Areas (ACAs)

It is an objective of Clare County Council:

- a) To ensure that new developments within or adjacent to an ACA respect the established character context of an area and contribute positively to the ACA in terms of design, scale, setting and material finishes.
- b) To protect from demolition or removal and non-sympathetic alterations, existing buildings, structures, groups of structures, sites, landscapes, and features such as street furniture and paving, which are considered to be intrinsic elements of the special character of the ACA.
- c) To ensure that all new signage, lighting, advertising, and utilities to buildings within an ACA are designed, constructed and located in a manner that does not detract from and is complementary to the character of the ACA; and
- d) To ensure that external colour schemes in ACAs enhance the character and amenities of the area and reflect traditional colour schemes.

Archaeological heritage is protected through a range of Development Plan Objectives covering both terrestrial and underwater archaeology as well as the raising of public awareness regarding archaeology. The following Clare CDP Objectives are pertinent to the Proposed Development:

CDP16.8: Development Plan Objective: Sites, Features and Objects of Archaeological Interest

It is an objective of Clare County Council:

- a) To safeguard sites, features and objects of archaeological interest generally.
- b) To secure the preservation (i.e., preservation in situ or in exceptional cases preservation by record) of all archaeological monuments included in the Record of Monuments and Places as established under Section 12 of the National Monuments (Amendment) Act, 1994, and of sites, features and objects of archaeological and historical interest generally.
- c) In securing such preservation, the Council will have regard to the advice and recommendations of the Department of the Arts, Heritage, Regional, Rural and Gaeltacht Affairs).
- d) To have regard to the government publication 'Framework and Principles for the Protection of the Archaeological Heritage 1999' in relation to protecting sites, features and objects of archaeological interest; and
- e) To advocate for greater financial assistance for the maintenance and improvement of features of archaeological interests in County Clare.

CDP16.9: Development Plan Objective: Newly Discovered Archaeological Sites

It is an objective of Clare County Council:

- To protect and preserve archaeological sites discovered since the publication of the Record of Monuments and Places

CDP16.12: Development Plan Objective: Raising Archaeological Awareness

It is an objective of Clare County Council:

- To raise awareness of and improve practice in relation to archaeology in County Clare. Guidance material will be produced setting out the requirements for archaeological protection in the County.

8.2.1.3 Limerick County Development Plan 2022 – 2028

Local policy for County Limerick is provided in chapter 6 of the Limerick County Development Plan 2022 – 2028 (Limerick CDP). This outlines strategic interlinked objectives of the Limerick CDP that include the following for heritage:

- **9. Protect, conserve and enhance the built and cultural heritage of Limerick, through promoting awareness, utilising relevant heritage legislation and ensuring good quality urban design principles are applied to all new developments. The principle that well planned and integrated development enhances the sustainability, attractiveness and quality of an area should be at the centre of any proposal.**

Heritage is protected through a range of Development Plan Objectives, only those applicable to this project are outlined. Archaeological heritage is protected through the following Limerick CDP Objectives:

- **Objective EH O36 Preservation of the Archaeological Heritage**

It is an objective of the Council to seek the preservation of all known sites and features of historical and archaeological interest. This is to include all the sites listed in the Record of Monuments and Places as established under Section 12 of the National Monuments (Amendment) Act 1994. The preferred option is preservation in situ, or at a minimum preservation by record.

- **Objective EH O37 Preservation of unrecorded/newly discovered Archaeological Heritage**

It is an objective of the Council to protect and preserve the preservation in situ (or at a minimum by record) of all sites and features of historical and archaeological interest, discovered subsequent to the publication of the Record of Monuments and Places.

- **Objective EH O39 Protection of the setting of Archaeological Monuments**

It is an objective of the Council to ensure that no development shall have a negative impact on the character or setting of an archaeological monument.

- **Objective EH O40 Proper procedures during the planning process**

It is an objective of the Council to:

- a) Ensure early engagement at pre-planning stage is undertaken with the Local Authority Archaeologist to promote the 'preservation in situ' of archaeological remains and settings in development.
- b) Adopt a policy of archaeological monitoring of developments where the scale and nature of such developments may, in the opinion of the Planning Authority, have a negative impact on previously unknown archaeological features/artefacts.
- c) Require the preparation of an Archaeological Heritage Assessment in cases where it is deemed that Archaeological Heritage would be affected by a proposed development (due to their location, size or nature). The report shall be prepared by a suitably qualified archaeologist on the archaeological implications, if any, of the proposed development either prior to a decision on a planning application or prior to commencement of development on site.

Protected Structures are protected through the following Limerick CDP Objectives. Only those applicable to the Proposed Development are noted:

- **Objective EH O50 Work to Protected Structures**

It is an objective of the Council to:

- a) Protect structures included on the RPS from any works that would negatively impact their special character and appearance.
- b) Ensure that any development proposals to Protected Structures, their curtilage and setting, shall have regard to the Architectural Heritage Protection Guidelines for Planning Authorities published by the Department of the Arts, Heritage and the Gaeltacht.
- d) Ensure that any development, modification, alteration, or extension affecting a Protected Structure and/or its setting, is sensitively sited and designed and is appropriate in terms of the proposed scale, mass, height, density, layout and materials.
- e) Ensure that the form and structural integrity of the Protected Structure is retained in any redevelopment and that the relationship between the Protected Structure and any complex of adjoining buildings, designed landscape features, or views and vistas from within the grounds of the structure are respected.
- g) Support the re-introduction of traditional features on protected structures where there is evidence that such features (e.g., window styles, finishes etc.) previously existed.
- h) Ensure that new and adapted uses are compatible with the character and special interest of the Protected Structure.
- i) Protect the curtilage of Protected Structures and to refuse planning permission for inappropriate development within the curtilage and attendant grounds, that would adversely impact on the special character of the Protected Structure.
- k) Ensure historic landscapes and gardens associated with Protected Structures are protected from inappropriate development.

Built Heritage assets recorded on the National Inventory of Built Heritage are protected through the following Limerick CDP Objective:

- **Objective EH O52 National Inventory of Architectural Heritage (NIAH)**

It is an objective of the Council to review and update the RPS on foot of any Ministerial recommendations including the NIAH and any future updates. The Ministerial recommendations, made under Section 53 of the Planning Act, will be taken into account when the Planning Authority is considering proposals for development that would affect the historic or architectural interest of these structures.

Architectural Conservation Areas assets are protected through the following Limerick CDP Objectives:

- **Objective EH O53 Architectural Conservation Areas**

It is an objective of the Council to:

- a) Protect the character and special interest of an area, which has been designated as an Architectural Conservation Area (ACA) as set out in Volume 3.
- b) Ensure that all development proposals within an ACA be appropriate to the character of the area having regard to the Character briefs for each area.

c) Ensure that any new development or alteration of a building within an ACA or immediately adjoining an ACA, is appropriate in terms of the proposed design, including scale, height, mass, density, building lines and materials.

d) Seek a high quality, sensitive design for any new development(s) that are complementary and/or sympathetic to their context and scale, whilst simultaneously encouraging contemporary design which is in harmony with the area. Direction can also be taken from using traditional forms that are then expressed in a contemporary manner, rather than a replica of a historic building style.

8.2.2 Guidance

The assessment of baseline conditions was carried out in accordance with the following guidance and the Historic England and Cork County Council guidance noted in section 8.3.1:

- EPA (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- EPA (2003). Advice Notes on Current Practice in the Preparation of Environmental Impact Statements'.
- Department of Arts, Heritage, Gaeltacht and the Islands (2005a). Frameworks and Principles for the Protection of the Archaeological Heritage.
- Department of the Environment, Heritage and Local Government (2009) Government Policy on Architecture 2009-2015.
- Department of Arts, Heritage and the Gaeltacht's (2011). Architectural Heritage Guidelines for Planning Authorities.
- NRA (2005a). Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes.
- NRA (2005b). Guidelines for the Assessment of Architectural Heritage Impacts of National Road Schemes.

8.3 Methodology

8.3.1 Setting Assessment Methodology

This assessment has been guided by *Historic England Historic Environment Good Practice Advice in Planning: Note 3 (Second Edition) – The Setting of Heritage Assets*¹ (Historic England methodology). The Setting of Heritage Assets provides guidance on setting and development management, including assessing the implications of development proposals, and is considered current best practice as a counterpart to which has not yet been produced in the Republic of Ireland, including the guidelines noted in section 8.2.2.

¹ Historic England (2017). *Historic Environment Good Practice Advice in Planning Note 3. 2nd edition.*

A staged approach is recommended for setting assessments, the first step of which is to identify the settings of the cultural heritage assets that may be affected. The second step is to assess whether, how and to what degree these settings make a positive contribution to the importance of the heritage asset(s), i.e., “what matters and why”. This includes a description of the key attributes of the cultural heritage asset itself, followed by consideration of the physical surroundings of the asset. This includes its relationship with other heritage assets, the way the cultural heritage asset is appreciated, and the asset’s associations and patterns of use. The third step (where appropriate) is to assess the effect of a proposed development on the significance of assets, through the consideration of the key attributes of the proposed development in terms of its location and siting, form and appearance, wider effects, and permanence.

The assessment methodology has also been guided by the DEHLG *Architectural Heritage Protection, Guidelines for Planning Authorities* which was published in 2004 and revised in 2011², relevant details of which follow. It is important to note that paragraph 13.8.1 of the 2011 Guidelines state that proposed developments outside the curtilage or grounds of a Protected Structure or Architectural Conservation Area (ACA) should be given similar consideration to proposed developments within the attendant grounds. This methodology has been combined with the Historic England methodology³, in order to conduct a similar and more robust assessment of the impacts of the Proposed Development on recorded archaeological monuments, in addition to architectural heritage.

The following guidance taken from the DAHG’s *Architectural Heritage Protection, Guidelines for Planning Authorities*⁴, has been followed regarding development within the attendant grounds:

“Development Within the Attendant Grounds

13.7.1 It is essential to understand the character of a site before development proposals can be considered. Where attendant grounds of particular significance are proposed for development, a conservation plan could be prepared in advance of any planning application which would identify the significance of the site and locate areas within the designed landscape, if any, which could accept change and development and those areas which could not without damaging the architectural heritage of the place.

13.7.2 When dealing with applications for works within the attendant grounds of a protected structure, a visit to the site should be considered an essential part of the assessment. The planning authority should consider:

- a) Would the development affect the character of the protected structure?*
- b) Would the proposed works affect the relationship of the protected structure to its surroundings and attendant grounds?*
- c) Would the protected structure remain the focus of its setting? For example, a new building erected between a structure and a feature within the attendant grounds will alter the character of both;*

² DAHG (2011). *Architectural Heritage Protection, Guidelines for Planning Authorities*

³ Historic England (2017).

⁴ DAHG (2011).

d) Do the proposed works require an alteration of the profile of the landscape, for example, the creation of a golf course? How would this affect the character of the protected structure and its attendant grounds?

e) Do the proposals respect important woodland and parkland? Do they conserve significant built features and landscape features?

f) Are there important views of or from the structure that could be damaged by the proposed development? Would important vistas be obstructed by new development?

g) Would distant views of important architectural or natural landmarks be blocked or changed? Would a significant skyline be altered?

h) Even where the proposed development is at a distance from the protected structure, could it still have an impact? This could include tall or bulky buildings interrupting views of or from the protected structure and other features of the designed landscape;

i) Where the new works would not be directly visible from the protected structure, would they be visible from the approaches to the structure or from other important sites or features within the attendant grounds? If so, would this be acceptable?

j) What effect would the scale, height, massing, alignment or materials of a proposed construction have on the protected structure and its attendant grounds?

Other Development Affecting the Setting of a protected structure or an Architectural Conservation Area:

13.8.1 When dealing with applications for works outside the curtilage and attendant grounds of a protected structure or outside an ACA which have the potential to impact upon their character, similar consideration should be given as for proposed development within the attendant grounds. A visit to the site should be considered an essential part of the assessment.

13.8.2 New development both adjacent to, and at a distance from, a protected structure can affect its character and special interest and impact on it in a variety of ways. The proposed development may be sited directly about the protected structure, as with buildings in a terrace. Alternatively, it may take the form of a new structure within the attendant grounds of the protected structure. A new development could also have an impact even when it is detached from the protected structure outside the curtilage and attendant grounds but is visible in an important view of or from the protected structure.

13.8.3 The extent of the potential impact of proposals will depend on the location of the new works, the character and quality of the protected structure, its designed landscape and its setting, and the character and quality of the ACA. Large buildings, sometimes at a considerable distance, can alter views to or from the protected structure or ACA and thus affect their character. Proposals should not have an adverse effect on the special interest of the protected structure or the character of an ACA.”

In addition to the legislation and guidance detailed, the setting assessment methodology has also adhered to the guidance contained within Cork County Council (CCC.), 2006, *Guidance Notes for the*

*Appraisal of Historic Gardens, Demesnes, Estates and their Settings*⁵. This document was prepared by CCC. in response to increasing adaptation and redevelopment of planned landscapes within the county. The guidance notes advise the following stepped approach, which also has relevance to development beyond Cork and has been applied to this assessment of the Proposed Development:

- Identification and description of development, history, features and boundaries of the designed landscape using scoping, archival research and fieldwork.
- Evaluation and assessment of aspects of significance including historical landscape description, archaeological and horticultural aspects.
- Assessing development proposals through an assessment of the heritage impact.
- Recommendations for mitigation and management including future research.

8.3.2 Study Area

A 1km study area has been used for non-designated assets and a 3km study area for designated assets, extending to 5km where applicable from the boundary of the Site, if intervisibility is possible (refer to Figure 8.1, EIAR Volume III). These study areas are deemed appropriate for the baseline, based on professional judgement and proportionality. These study areas are considered sufficient to identify all potentially affected designated and non-designated assets, their setting and geographical extent, and to inform the context of and potential survival of archaeological remains within the Site and its immediate surrounding area.

The cultural heritage impact assessment considers all recorded cultural heritage assets within a study area that extends 1km from the boundary of the Site of the Proposed Development. The extent of this study area was determined by the nature of the Proposed Development, which consists of a limited surface area of disturbed ground within an operational power plant and, therefore, is unlikely to impact upon cultural heritage assets located beyond this distance. The aim of this assessment was to inform decisions about further field survey techniques and / or mitigation to be applied, if necessary.

Additionally, an assessment of setting was made for designated heritage assets (National Monuments, Protected Structures as recorded on the Kerry CDP, Clare CDP and Limerick CDP and Architectural Conservation Areas) within an outer study area around the Proposed Development. No significant effects were anticipated in regard to the settings of non-designated sites due to the physical nature of these sites and/or intervening topography. Therefore, the settings assessment focused on designated sites only. Designated heritage assets up to 3km from the Site of the Proposed Development were assessed under this methodology, extending to 5km where applicable. This was based on the intervisibility between the Proposed Development and the designated heritage assets, taking into account topography, vegetation and buildings, determined through initial desktop assessment using Google Streetview, followed by a Site visit, where necessary.

⁵ CCC (2006). *Guidance Notes for the Appraisal of Historic Gardens, Demesnes, Estates and their Settings*.

8.3.3 Determination of Baseline Environment

A Cultural Heritage asset is defined as *a monument, building, group of buildings or site which are the works of man or the combined works of nature and man constituting the historic or built environment*⁶.

A heritage asset's value is not solely expressed through any designated status but can also be exhibited through a series of values or special interests. These include architectural, historical, artistic, archaeological, cultural, scientific, social or technical interests. There is the potential for non-designated assets to display special interests equivalent to a designated asset. Therefore a "designated" status does not necessarily confer a set level of importance on an asset, rather a level of importance is assigned based on an assessment of the special interest displayed by that asset and professional judgement.

Section 2 of the 1930 National Monuments Act (as amended) defines a 'national monument' as "*a monument or the remains of a monument the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic, or archaeological interest attaching thereto.*" National Monuments are considered nationally important.

National Monuments and Record of Monuments and Places (RMP) sites / Register of Historic Monuments (RHM) sites are not clearly differentiated in the National Monuments Act 1930 (as amended). However, not all RMP and RHM sites and associated constraint areas demonstrate the same level or degree of heritage special interest as can be found in National Monuments. Therefore, they can be of either national or regional importance. An assessment of the special interest of the asset and professional judgement is used to identify the appropriate level of importance.

Some archaeological and architectural heritage assets are also included on the Record of Protected Structures (RPS) of each County or City Development Plan, under Section 51(1) of the Planning and Development Act, 2000 (as amended) (the Act). These protected structures are included in the RPS due to their special architectural, archaeological, artistic, cultural, historical, scientific, social or technical interest. Protected structures are considered to be of international, national or regional importance.

Architectural Conservation Areas (ACAs) are areas which are designated in a County Development Plan, under Section 81(1) of the Act, in order to "*preserve the character of a place, area, group of structures or townscape*" that are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or value; or "*contributes to the appreciation of protected structures.*" ACAs are considered to be of either national or regional importance.

The National Inventory of Architectural Heritage (NIAH) was established to assist councils in assessing whether structures should be added to their RPS. These architectural heritage assets are rated to be of either international, national, regional, local or 'record only' importance.

The NIAH also contains a Garden Survey which includes designed landscapes such as parks, gardens and demesnes. These can be divided into those with substantially intact landscapes and features; and those where the landscape has been significantly eroded by later changes with only peripheral features intact. For the purposes of this assessment, the substantially intact landscapes are judged to be of

⁶ UNESCO (1972). *Convention concerning the Protection of the World Cultural and Natural Heritage*.

international, national or regional importance while the denuded landscapes are judged to be of local importance.

Townlands are the lowest level, officially defined geographical area in Ireland and date to before the Anglo-Norman period (12th century). The boundaries of townlands are often visible in the landscape as walls, tree-lined ditches and embankments or natural features such as streams. They provide visible physical evidence of historical territory or political boundaries and are regarded as being of local importance as historic, cultural heritage features.

8.3.4 Determination of Sensitive Receptors

In order to assess the potential effects of a development upon a heritage asset, it must first be assigned a level of importance. This can be done in accordance with a four-point scale, (refer to Table 8.1). This table has been derived from the guidance noted in section 8.2.2, with reference to the above legislation and policy, and using professional judgement:

Table 8.1: Factors Determining the Value of Heritage Asset

Importance	Criteria
International / Very High	- World Heritage Sites. - Protected Structures deemed to be of very high importance using legislation, EPA guidance, National Inventory of Architectural Heritage (NIAH) rating criteria and professional judgement. - Structures and Designed Landscapes recorded by the NIAH. - Building and Garden Survey with an International Rating.
National / High	- National Monuments. - Recorded Monuments deemed to be of high importance using legislation, EPA guidance, NRA Significance Criteria and professional judgement. - Protected Structures deemed to be of high importance using legislation, EPA guidance, NIAH rating criteria and professional judgement. - Structures recorded by the NIAH Building Survey with a National Rating or deemed to be of high importance using legislation, EPA guidance, NIAH rating criteria and professional judgement. - Designed landscapes recorded by the NIAH Garden survey with main features substantially present and deemed to be of high importance using legislation, EPA guidance, NIAH rating criteria and professional judgement. - Architectural Conservation Areas containing structures and/or designed landscapes of predominantly national importance. - Non-designated archaeological remains which are rare or complex in nature, and deemed to be of high importance using legislation, EPA guidance, NRA Significance Criteria and professional judgement.
Regional / Medium	- Recorded Monuments deemed to be of medium importance using legislation, EPA guidance, NRA Significance Criteria and professional judgement. - Protected Structures deemed to be of medium importance using legislation, EPA guidance, NIAH rating criteria and professional judgement. - Structures recorded by the NIAH Building Survey with a Regional Rating or deemed to be of medium importance using legislation, EPA guidance, NIAH rating criteria and professional judgement. - Designed landscapes recorded by the NIAH garden survey with main features substantially present and deemed to be of medium importance using legislation, EPA guidance, NIAH rating criteria and professional judgement. - Architectural Conservation Areas containing structures and/or designed landscapes of predominantly regional importance. - Non-designated architectural heritage assets which are deemed to be of medium importance using legislation, EPA guidance, NIAH rating criteria and professional judgement.

Importance	Criteria
	Non-designated archaeological remains which are neither particularly common nor uncommon, and/or of moderate complexity, and deemed to be of medium importance using legislation, EPA guidance, NRA Significance Criteria and professional judgement.
Local / Low	- Structures recorded by the NIAH Building Survey with a Local or Record Only Rating or deemed to be of low importance using legislation, EPA guidance, NIAH rating criteria and professional judgement. - Designed landscapes recorded by the NIAH garden survey which have poor historic legibility or have only peripheral features surviving, and deemed to be of low importance using legislation, EPA guidance, NIAH rating criteria and professional judgement. - Townland Boundary Features. - Non-designated architectural heritage assets which are deemed to be of low importance using legislation, EPA guidance, NIAH rating criteria and professional judgement. - Non-designated archaeological features which are particularly common or in poor condition, and deemed to be of low importance using legislation, EPA guidance, NRA Significance Criteria and professional judgement.

8.3.5 Describing Potential Impacts

Having identified the value of the heritage asset, the magnitude of the impact from the Proposed Development is assessed. A potential impact is defined as a change resulting from the Proposed Development, which affects a heritage asset. These impacts are considered using the following broad categories; Quality, Significance, Extent and Context of Impacts, Probability of Impact and Duration⁷.

The quality of an impact can be reported on a three-point scale:

- Positive / beneficial** – a change which improves the quality or the special interests of the asset, for example the removal of an element of the surrounding setting which detracts from the appreciation of an asset;
- Neutral** – a change which does not affect the quality or special interests of the asset; and
- Negative / adverse** – a change which reduces the quality or special interest of the asset, for example the removal of a below-ground archaeological deposit through construction.

The significance of an impact can be judged on a seven-point scale:

- Imperceptible impact** – a change capable of measurements but without significant consequences;
- Not significant** – an impact which causes noticeable changes in the character of the asset but without significant consequences;
- Slight impact** – an impact which causes a noticeable change without affecting the special interests or qualities of the asset to any particular degree;
- Moderate impact** – a change which alters the character or special qualities of an asset in a manner that is consistent with existing and emerging baseline trends;
- Significant impact** – an impact which, by its character, magnitude, duration or intensity, alters the special interests or qualities of an asset;

⁷ EPA (2022). *Guidelines on Information to be contained in Environmental Impact Assessment Reports*.

- **Very significant** – an impact which, by its character, magnitude, duration or intensity significantly changes the special interests or qualities of an asset; and
- **Profound impact** – an impact which obliterates the special interest or qualities of an asset.

The extent and context of impacts can be assessed by the following two descriptions:

- **Extent** – the description of the size of the area and number of assets affected by the impact; and
- **Context** – the description of whether the extent, duration, or frequency will conform or contrast with established baseline conditions relating to an asset.

The probability of impacts can be described by the following two points:

- **Likely impacts** – these are impacts that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented; and
- **Unlikely impacts** – these are impacts that can reasonably be not expected to occur because of the planned project if all mitigation measures are properly implemented.

The duration of an impact can be defined by the following criteria:

- **Momentary impact** – impact lasting from seconds to minutes;
- **Brief impact** – impact lasting for a day or less;
- **Temporary impact** – impact lasting for one year or less;
- **Short-term impact** – impact lasting one to seven years;
- **Medium-term impact** – impact lasting seven to fifteen years; and
- **Long-term impact** – impact lasting fifteen to sixty years.

Impacts can also be identified as permanent, i.e., lasting over sixty years; and reversible, i.e., can be reversed through remediation or restoration. Another consideration is the frequency of the impact, i.e., how often will the impact occur: once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually.

These impacts have been derived from the EPA *Guidelines for the Information to be contained in an EIAR*⁸. These impacts are equally applicable to the setting of an asset.

The impact score is arrived at without reference to the value of the asset. It can be given against a four-point scale:

- Very high;
- High;
- Medium; and
- Low.

⁸ EPA (2022).

The level of impact takes into account mitigation measures, which have been embedded within the Proposed Development as part of the design development process.

Taking these criteria into consideration, the magnitude of impact can be assigned by reference to a four-point scale, refer to Table 8.2.

Table 8.2: Factors Determining the Magnitude of Impact

Magnitude Of Impact **Description**

Very High	Change such that the special interests or qualities of the asset are totally altered or destroyed. Comprehensive change to setting affecting importance of asset, resulting in a serious loss in our ability to understand and appreciate the asset.
High	Change such that the special interests or qualities of the asset are affected. Noticeably different change to setting affecting importance, resulting in erosion in our ability to understand and appreciate the asset.
Medium	Change such that the special interests or qualities of the asset are slightly affected. Slight change to setting affecting significance resulting in a change in our ability to understand and appreciate the asset.
Low	Minimal change to the asset that has little effect on its special interests or qualities. Does not affect our ability to understand and appreciate the asset.

8.3.6 Significance of Effect

Once the magnitude of the impact has been identified, this can be cross-referenced with the importance of the asset to derive the overall significance of effect, or the consequence of the change resulting from a proposed development, refer to Table 8.3. The significance can be judged on a seven-point scale:

- **Imperceptible** – a change capable of measurement, but without significant consequences.
- **Not significant** – a change which causes noticeable changes in the character of the asset, but without significant consequences.
- **Slight effect** – a change which causes a noticeable change without affecting the special interests or qualities of the asset to any particular degree.
- **Moderate effect** – a change which alters the character or special qualities of an asset in a manner that is consistent with existing and emerging baseline trends.
- **Significant effect** – a change which, by its character, magnitude, duration or intensity, alters the special interests or qualities of an asset.
- **Very significant** – a change which, by its character, magnitude, duration or intensity significantly changes the special interests or qualities of an asset.
- **Profound effect** – a change which obliterates the special interest or qualities of an asset.

Table 8.3: Significance of Effect Matrix

Magnitude of Impact	Importance of Cultural Heritage Asset			
	Local	Regional	National	International
Very High	Significant	Significant	Profound	Profound

Magnitude of Impact	Importance of Cultural Heritage Asset			
	Local	Regional	National	International
High	Moderate	Significant	Significant	Profound
Medium	Slight	Moderate	Significant	Significant
Low	Imperceptible	Slight	Slight	Moderate

For the purposes of this chapter, moderate to profound effects are classed as significant. Once a significant effect has been identified, additional mitigation can be applied to offset, reduce or compensate for any significant adverse effects, or to enhance positive effects. Reassessing the significance of effect after applying additional mitigation reflects the success rating of the mitigation and allows the level of residual effect to be assessed.

8.3.7 Limitations

The assessment is based upon currently available information at the time of writing including a walkover survey of the study area (section 8.4.11). No additional fieldwork has been undertaken as part of the assessment.

8.4 Baseline Environment

8.4.1 Geology and Topography

The Site is located in Tarbert, County Kerry (Co. Kerry), approximately 1.8km north of the town of Tarbert. The Site is located within the SSE Tarbert site boundary which occupies an area of approximately 42ha.

The Site is off the N67, a National Secondary Road in Tarbert, Co. Kerry, and is a brownfield site, surrounded by electricity generating, transmission and fuel storage infrastructure. The entire island is underlain by Made Ground, with natural topsoil and subsoils in the surrounding area consisting of Till derived from sandstone and shale (AECOM, 2022). The bedrock geology underlying the Site consists of the Shannon Group of undifferentiated mudstones, siltstones, and sandstones with bedrock outcrops present along the shoreline.

8.4.2 National Monuments

There are no National Monuments either within the Site or the surrounding 1km study area or 3km settings assessment area (refer to EIAR Volume III, Figure 8.1).

8.4.3 Recorded Archaeological Assets Within the 1km Study Area

Two archaeological assets are recorded within the red line boundary of the Site (refer to EIAR Volume III Figure 8.1). The first is the Tarbert Island Battery (KE003-002) which has been demolished with the existing Tarbert heavy fuel oil (HFO) Power Station built over it. The Tarbert Island Battery was first erected in 1782 in response to naval threats during the American Revolutionary War (1775-1783) when America fought Britain for independence. Tarbert Bay was used as an anchorage by merchant shipping

and the battery was constructed to defend this shipping⁹. The battery, at this time, comprised a detachment of artillery and a company of infantry.

Peacetime saw the battery abandoned only for new fortifications to be erected between August 1794 and June 1795 in response to the outbreak of war with the new French Republic in 1793. New fortifications were erected under the instruction from Lieutenant General of the Irish Board of Ordnance, the Honourable Thomas Pakenham, with a redoubt constructed holding sixteen 24-pounders and six 6-pounders.

In 1810, the site was modified again as part of the Gothen Mann Committee proposals for the fortification of the Shannon estuary. It was recognised that a hostile power landing on the Shannon Estuary could take the crossing points on the River Shannon after a two-day march¹⁰. Tarbert was one of six batteries proposed on the estuary which included Kilcredaun (CL072-027002), Doonaha (CL066-03700), Scatterry Island (CL067-024015) and Kilkerin (CL068-046). The new battery was bastion-shaped in plan with two faces overlooking the estuary and a defensible guardhouse to the rear, all set on the highest part of Tarbert Island. The Pakenham redoubt was kept in use and faced with stone while the battery of 1783 may also have been retained. The battery was surrounded by a dry moat.

In 1872 Tarbert Fort contained six 68-pound smooth bore cannons and two 5.5-inch howitzers but was abandoned in 1892¹¹. The battery was demolished during the 1960s when Tarbert HFO Power Station was constructed.

The second archaeological asset located within the boundaries of SSE Tarbert site is a burial (KE003-068) which was uncovered during construction works in May 1965. The burial was located under a flagstone 1.2m below ground level and 5.5m from the shoreline of the estuary. It had been heavily disturbed by the time the burial was noticed by the workmen who noted that the bones were uncovered from river gravel similar to that within the surrounding area. The National Museum and local coroner were informed of the discovery with both agreeing that the bones should be reburied (presumably outside the boundaries of Tarbert HFO Power Station). The exact location of the burial and reburial are, now, unknown.

One other archaeological asset is located within the 1km study area. This is a bastioned fort (KE003-001) which is located on high ground 356m to the south-west of the Proposed Development. It is shown as a small six-pointed star fort on the 1st edition OS map (1841) although the northern side has since been badly damaged by the construction of the power station while the remainder is now heavily overgrown. It comprises well-defined stone banks and an external ditch with its form very similar to a fort at Dunboy Castle (CO128-001002). The fort at Dunboy dates to the 1641-1660 period and it is surmised that the Tarbert example also dates to this period.

In 2010, an assessment and test-trenching was undertaken at an undeveloped area within the boundaries of the Tarbert HFO Power Station site within the zone of archaeological potential for the fort (KE003-001). Five test-trenches were excavated to establish the extents of the monument with a ditch feature exposed in three of the test-trenches¹². This was interpreted as the outer ditch of KE003-001

⁹ McEnery, 2006 Fortress Ireland. *The story of Irish coastal forts and the River Shannon defence line.*

¹⁰ McEnery 2006

¹¹ McEnery 2006

¹² Coyne 2010 Tarbert (Demesne), Kerry in Bennett, I (Ed) *Excavations.ie Database of Irish Excavation Reports.*

as its location and orientation was comparable to that shown in the 1st edition OS mapping (1841) as well as the line of the ditch as shown hachured on the 1997 RMP constraint map. The outer edge of the ditch was cut through large shale boulders in the natural parent material.

8.4.4 Record of Protected Structures (RPS) Within the 1km Study Area

There are two Protected Structures recorded on the Kerry CDP within the 1km study area. The closer is Tarbert Lighthouse (RPS-KY-0891) which is located on the northern tip of foreshore on Tarbert Island 90m to the north of the Proposed Development.

The lighthouse is one of the earliest built in Kerry and opened in March 1834. Samuel Lewis (1837) described as a 'lofty and handsome' lighthouse¹³. It is 22m high, commanding extensive views across the estuary and is accessed via a footbridge leading to the shore. The lighthouse is marked on the 1st edition OS map (1840) with a Light Keeper's House marked to the south-west on the northern shoreline of the island. This Light Keeper's House remains extant within the SSE Tarbert site although it is not recorded as a heritage asset and is not a Protected Structure.

The second Protected Structure is Tarbert House (RPS-KY-0884) which is located 807m to the south of the Proposed Development. This detached seven-bay three-storey over part-raised basement early-Georgian house with three-bay side elevations dates to 1720 and was built by the Leslie family who still own it. The house was renovated and possibly refenestrated around 1890 with a single-bay, single-storey projecting porch added. Exterior features comprise a detached single-bay single-storey rubble stone-built outbuilding, built c. 1840, to the southeast, a detached six-bay two-storey rubble stone-built stable block, built c. 1840, to southwest retaining original fenestration with elliptical-headed integral carriage arch to ground floor, a gateway to the south-west, built c. 1840, comprising pair of cut-stone octagonal piers with wrought-iron gates and a gateway to south-east, built c. 1840, comprising pair of cast-iron piers with decorative cast-iron gates and railings.

The house and associated structures are located within the surrounding Planned Landscape, Tarbert Demesne (NIAH 2051), which incorporates most of the peninsula onto the Shannon Estuary. Tarbert House is also recorded on the National Inventory of Architectural Heritage (NIAH) as NIAH 21300310.

8.4.5 Architectural Conservation Areas (ACAs) Within the 1km Study Area

There are no ACAs within the 1km study area around the Site (refer to EIAR Volume III, Figure 8.1).

8.4.6 National Inventory of Architectural Heritage (NIAH) Building Survey Within the 1km Study Area

There is one asset recorded on the NIAH within the 1km study area (refer to EIAR Volume III Figure 8.1). This is Tarbert House (NIAH 21300310) which is also a Protected Structure and has been discussed in section 8.5.4 under this higher designation.

8.4.7 National Inventory of Architectural Heritage Gardens Survey

There is one Planned Landscape present within the 1km study area (refer to EIAR Volume III Figure 8.1). This is Tarbert Demesne (NIAH 2051) (174m west of the Proposed Development site) which dates

¹³ Lewis 1837 *A Topographical Dictionary of Ireland*.

to the 18th century although the grounds incorporate a moated site (KE003-012) dating to between 1641 and 1659. The demesne is shown on all OS mapping with the demesne comprising the main house, walled garden and dense planting occupying the peninsula onto the Shannon Estuary and giving name to the surrounding townland. Garden features included avenues, tree-rings and boat slips onto the estuary. Many features are still extant with the demesne still discernible on mapping and aerial photography due to the presence of dense mature planting. Development at SSE Tarbert site has encroached the northern extent of the Tarbert Demesne with a row of tanks now present associated with the National Oils Reserve Agency facility positioned on the mainland.

8.4.8 Previous Archaeological Investigations

A previous archaeological investigation took place in 2010 in relation to a proposed development located within the SSE Tarbert site. This investigation specifically concentrated on the fort (KE003-001) and has been described in association with this asset.

Another archaeological investigation took place adjacent to the existing Tarbert HFO Power Station in 2009 and comprised the examination of the intertidal zone adjacent to the former location of the battery (KE003-002). The survey noted shingle lying on top of rock outcrop with nothing of an archaeological nature recorded¹⁴.

8.4.9 Historic Cartographic Evidence

The 1st edition OS map (1841) shows the location of the Site in good definition (map not reproduced). The location of the Site is identified as Tarbert Island and it is clearly separate from the mainland although access is possible via a causeway and foot bridge leading to the southern shoreline of the island.

The battery (KE003-002) was in operation at that time and is the most prominent feature occupying the higher ground within the east of the island. The battery is clearly marked as is the defensible barracks and surrounding dry moat which is crossed by a draw bridge. The Master Gunner's House is located to the immediate south-east of the battery. The battery is accessed via a lane extending from the causeway on the southern shoreline.

A large building resembling an inverted 'T' is shown to the south-east of the battery (KE003-002) close to the east shoreline. This building is bounded to the south and east by a vegetable garden. A large 'C'-shaped building, identified as a Coastguard Station, is located within the south-west corner of the island directly adjacent to where the causeway makes landfall. Several smaller structures are visible around the Coast Guard Station including a signal mast. A second signal mast is marked to the north, west of the battery. Vegetable plantations are shown on all sides of the Coast Guard Station apart from the east.

A road leads east along the southern shoreline from the causeway and provides access to a quay where a steam packet office and stores are located. Marginal ground extends south-west to north-east across the island to the immediate west of the high ground. This marginal ground appears to divide the island in two with a small area of fry ground indicated on the north-west shoreline. The Light Keeper's House

¹⁴ Coyne 2009 Tarbert, Kerry in Bennett, I (Ed) *Excavations.ie Database of Irish Excavation Reports*.

associated with Tarbert Lighthouse (RPS-KY-0891) is identified while Tarbert Lighthouse, itself, is marked on the north-east foreshore of the island. A track extends south-west from the Light Keeper's House to the western tip of the island. The northern shoreline of the mainland is a short distance to the south and the presence of the track suggests that access is possible at low tide.

The star shaped fort (KE003-001) is clearly marked on Massy's Hill on the mainland. Tarbert Demesne (NIAH 2051) is very apparent as dense planting around Tarbert House (RPS-KY-0884).

The 2nd edition OS map (1896) shows the location of the Site at the start of the 20th century (map not reproduced). The location of the Site shows some change as the battery (KE003-002) has been abandoned four years previously and it is shown as an indistinctive structure with its moat possibly infilled. The Master Gunner's House is still extant as is the 'T'-shaped building on the east coast. Two boat houses with slips are now marked adjacent to the 'T'-shaped building suggesting that it is related to the Coastguard Station. The Coastguard Station is still clearly marked in the south-west corner while the surrounding buildings have become more substantial as has the causeway to the mainland. In contrast, the footbridge previously shown no longer exists. The steam packet terminal has expanded with a complex of buildings and a substantial new quay.

The marginal area subdividing the island is now marked as covered by Spring Tides. Tarbert Lighthouse (RPS-KY-0891) is clearly marked with the light keeper's house also marked but not identified. The path to the western shoreline is still extant. The features on the mainland are still clearly marked although the star-shaped fort (KE003-001) is less well defined possibly suggesting its sides have degraded.

The 3rd edition OS map (1921) shows the location of the Site during the 1930s (map not reproduced). There is little change from the previous map edition although the battery (KE003-002) is better defined suggesting its walls and moat are still extant. The coastguard station is also still extant although the 'T'-shaped building has been reduced to a single rectangular building orientated west to east.

The steam packet office and associated buildings have been reduced in size although the quay facilities are still substantive. Tarbert Lighthouse (RPS-KY-0891) is clearly labelled and identified as having a fixed white light. The light keeper's house is shown but not identified while a pier now extends into the foreshore to its immediate north-west. The star-shaped fort (KE003-001) is barely recognisable as a fortification.

Construction of Tarbert HFO Power Station started in 1965 removing the battery (KE003-002) and its associated features and the coastguard station. The oil fired Tarbert Power Station now dominates the island being prominently marked on cartographic sources since the 1960s. The steam packet office and associated buildings no longer exist, although the quay facilities are still extant.

8.4.10 Aerial Photographic Evidence

Current aerial photographic evidence (www.google.ie) shows the existing layout of the Site (Accessed 31/05/23, not reproduced). The Site is occupied by the SSE oil fired Tarbert Power Station with its two large 151m tall emission stacks and there are no traces of the battery (KE003-002) or coastguard station which formerly occupied the location. The SSE Tarbert site also incorporates the former peripheral marginal land with this area infilled with infrastructure and hardstanding set upon it. Tarbert Lighthouse

(RPS-KY-0891) is clearly visible, and the former Light Keeper's House is also extant within the Power Station site.

The former steam packet office no longer exists with the location now occupied by a car park. The quays are still major features as is the causeway leading to the mainland. The area to the west of this has been infilled with made ground and appears to be under marginal grass. The location of the star-shaped fort (KE003-001) is overgrown and there are no clearly visible signs of this asset. In contrast, the remains of Tarbert Demesne (NIAH 2051) is very apparent as dense planting around Tarbert House (RPS-KY-0884) which is a very distinctive structure set back within its grounds. The surrounding townland is called Tarbert Demesne, although the demesne has been denuded so that only the dense planting is now apparent as a planned landscape rendering this asset as of Local importance.

8.4.11 Site Walkover (13 and 14 June 2023)

The Proposed Development will be located within the footprint of the SSE Tarbert site. The proposed OCGT and associated structures will be located within the north-western section of the SSE Tarbert site and directly adjacent to the existing Tarbert HFO Power Station, in an area currently occupied by a number of existing structures and site infrastructure, refer to EIAR Volume II Appendix 8B – Photograph 8.1. The existing buildings include workshops, toilet blocks, storage buildings (including chemical storage) and areas, a water treatment plant and tank and fuel lines.

The Proposed Development will also include flood defence measures, comprising concrete walls incorporated into the construction of the OCGT enclosure in parts, refer to EIAR Volume II Appendix 8B – Photograph 8.2. As noted on the aerial photography, these areas comprise made ground and infill set on marginal ground around the edges of Tarbert Island and the marine channel separating the island from the mainland. The infill / made ground nature of these areas is clearly visible in photograph 8.2 Appendix 8B (EIAR Volume II) as is disturbance from the existing Tarbert HFO Power Station.

The existing Tarbert HFO Power Station is a prominent structure made more visible by the 151m adjacent twin emissions stacks, refer to EIAR Volume II Appendix 8B – Photograph 8.3. The Proposed Development will be located immediately adjacent to this structure and will be largely screened by it in views from the south, east and north-east while it will blend in against the structure in views from the west and north-west.

The recorded heritage assets on Tarbert Island comprise the battery (KE003-002) and burial (KE003-068) which were both removed by the construction of the Tarbert HFO Power Station. One unrecorded heritage asset is noted within the boundaries of the Proposed Development. This is the light keeper's house which is marked on historic OS mapping and associated with Tarbert light house (RPS-KY-0891), refer to EIAR Volume II Appendix 8A. The light keeper's house is still extant and appears fully intact comprising a single storey building with a flat roof and red brick chimney stacks. The house is set within a sub-rectangular area defined by a stone wall and iron railings. This property and the nearby slipway/hard standing are owned by the Commissioners for Irish Lights and can be regarded as being of Regional importance due to its connection to the light house. It will not be impacted by the Proposed Development (section 8.6.1).

8.5 Impact Assessment Methodology

Designated heritage assets (National Monuments and Protected Structures) within 3km of the Site were assessed. Designated heritage assets with potential direct lines of sight outside this 3km study area were also examined up to a distance of 5km. Non-designated heritage assets including recorded monuments, structures and designed landscapes recorded by the NIAH within 1km of the Site were also assessed.

Sixteen Protected Structures, two ACA, two recorded monuments and two assets recorded on the NIAH were assessed using Google Streetview, aerial / satellite imagery and mapping (accessed 31/05/23). Sites which were evidently screened by intervening modern development or dense vegetation during this review were scoped out of further assessment, as their settings were not considered to include the Site. Other sites, which by their nature would not be impacted upon by development some distance away, such as archaeological sites discovered through archaeological excavation or screened by intervening vegetation, were also scoped out.

Following the review, a total of 17 cultural heritage assets (refer to Appendix 8A, EIAR Volume II), comprising one Planned Landscape, two ACA, one recorded monument and 13 Protected Structures were considered to be potentially sensitive to change from the Proposed Development (Figure 8.1, EIAR Volume III). The locations of these assets were viewed as closely as possible from publicly accessible locations and their settings and the contribution of setting to their importance were assessed. As described, the Proposed Development was found to be screened from the majority of the designated assets by topography, or multiple areas of dense vegetation. Notwithstanding this screening, it was concluded that the Site does not contribute to the importance of these assets.

The closest extant heritage asset to the Site is Tarbert Lighthouse (RPS-KY-0891). As noted on the aerial photography, this asset is very evident as it is set out on the northern foreshore of the island EIAR Volume II Appendix 8B – Photograph 8.5. This regionally important asset is only visible from the Shannon Estuary with the best views from the Killimer Ferry. The existing Tarbert HFO Power Station forms the backdrop to this asset and the Proposed Development will be clearly visible.

The next closest heritage asset to the Site is the Planned Landscape, Tarbert Demesne (NIAH 2051) which, at its closest point, is 174m, to the southwest of the Site boundary, refer to EIAR Volume II Appendix 8B– Photograph 8.6. The dense boundary planting screens all views into the demesne which is considered to be of local importance. This includes views to the designated Protected Structure, Tarbert House (RPS-KY-0884), which is set back within the demesne 807m to the south of the Site (EIAR Volume II Appendix 8B – Photograph 8.7).

The bastioned fort (KE003-001), is located 356m to the south of the redline boundary, refer to EIAR Volume II Appendix 8B – Photograph 8.8. This asset is non-designated and is considered to be of local importance. This asset is located on high ground overlooking the power station, although its location is heavily overgrown obstructing views between the asset and the Site.

The town of Tarbert is south of the Site and saw prosperity during the 19th and early 20th centuries due to its location on the Shannon and proximity to the coastal battery. It was the main port within the area for the export of grain and pigs and the import of trade goods. The presence of the steamship company

also meant a heavy passenger traffic on the waterfront. This prosperity translated into the commercial and domestic buildings that are still evident today.

The remains of the former creamery (RPS-KY-0883), now used as the boundary wall for a modern housing development is located on the north-east edge of Tarbert 1.54km from the Site, EIAR Volume II Appendix 8B - Photograph 8.9. Views between this asset, which is deemed to be of regional importance, and the Site are completely screened by intervening housing and the dense vegetation of Tarbert Demesne (NIAH 2051). There are no views to the Site.

The former Bridewell (RPS-KY-0882) is a very distinctive building of regional importance located to the north-west of the remains of the former creamery (RPS-KY-0883) and 1.56km from the Site, EIAR Volume II Appendix 8B - Photograph 8.10. Views between this asset and the Site are completely screened by intervening housing while its main aspect faces south towards the town. There are no views to the Site.

The former industrial building (RPS-KY-0878) now remains as a boundary wall and arched gate to a yard 1.66km to the southwest of the Site, EIAR Volume II Appendix 8B - Photograph 8.11. This regionally important asset faces west on a corner where any views towards the Site are screened by intervening buildings including the former Bridewell (RPS-KY-0882). There are no views to the Site.

The Protected Structure, Coolahans (RPS-KY-0879) and the buildings of Tarbert ACA are located within the centre of the town 1.6km south-southwest of the Site EIAR Volume II Appendix 8B - Photograph 8.12 and 8.13. These regionally important buildings face out onto the streets where they are located and any views towards the Site are blocked by the existing streetscape. There are no views to the Site.

Similarly, the Protected Structure, Saint Mary's Catholic Church (RPS-KY-0886) and its adjacent Presbytery (RPS-KY-0885) are located on the N69 in south Tarbert 1.95km to the south of the Site EIAR Volume II Appendix 8B - Photograph 8.14 and 8.15. These regionally important church buildings date to the 19th century with the church forming an impressive building on approaching the town from the south. There are no views to the Site with views to the north blocked by intervening buildings.

The last Protected Structure within Tarbert is Saint Brendan's Church (Kilnaughtin) (RPS-KY-0887) which is located on Steeple Road to the east of the town and 1.85km to the south of the Site, EIAR Volume II Appendix 8B - Photograph 8.16. The existing main building and emission stacks of Tarbert HFO Power Station is visible from this location and the new structures of the OCGT will also be partially visible.

The ACA of Demesne of Glin Castle and associated features is located on the Coast Road in Co. Limerick 4.43km to the south-east of the Site. The Demesne covers the Planned Landscape associated with Glin Castle which dates to the late 18th century with associated features dating to the 19th century. Glin Castle faces north towards the Shannon Estuary and views towards the Site are blocked by mature tree growth associated with the Demesne. The existing Tarbert HFO Power Station is visible from the Coast Road at the location of the ACA of Demesne of Glin Castle and associated features, EIAR Volume II Appendix 8B - Photograph 8.17. The proposed OCGT will also be partially visible from this location although the new structures will be partially screened by the existing industrial buildings while the Site does not form part of critical views towards the ACA.

The remaining Protected Structures are located within Co. Clare with the closest being Bessborough House (RPS 483) which is located 2.83km to the north-northwest of the Site. Bessborough House is located within its own grounds to the immediate west of Killimer. It dates to the 18th century and comprises a large three storey building which is considered regionally important, refer to EIAR Volume II Appendix 8B - Photograph 8.18. The house faces east and is screened to the north, west and east by dense, mature tree growth. The house is clearly visible from the Shannon Estuary to the south with the best views from the Killimer Ferry. The Proposed Development will be visible from Bessborough House and will not be screened by the existing Tarbert HFO Power Station structures. However, the new structures will blend into the overall existing industrial landscape of the power station site which does not form part of critical views to Bessborough House. Additionally, the existing industrial landscape of the Tarbert HFO Power Station is set against higher ground to the south with only its 151m emissions stacks prominent on the skyline.

Oaklands (RPS 036) is located at Knock in Co. Clare 4.5km to the north-east of the Site, refer to EIAR Volume II Appendix 8B - Photograph 8.19. This regionally important house dates to 1800 and is set on a hill overlooking the Shannon Estuary. The house is surrounded by mature trees which screen views although the existing Tarbert HFO Power Station is visible. The Proposed Development will be visible, but it will blend into the overall existing industrial landscape of the power station site.

Knock Pier (RPS. 589) is located on the northern shore of the Shannon Estuary 4.6km to the north-east of the Site, refer to EIAR Volume II Appendix 8B - Photograph 8.20. This regionally important pier extends south-east into the estuary. The Site does not form part of the main view from the pier although it is visible to the south-west. The Site will be visible, but it will blend into the overall existing industrial landscape of the power station site.

The final Protected Structure is Kilkerin Fort (RPS 345) which is located at Lackyle North on a peninsula 2km to the north-east of the Site, refer to EIAR Volume II Appendix 8B - Photograph 8.21. This battery dates to the early 19th century and was intended, with the former Tarbert Island Battery (KE003-002), to provide a crossfire against any hostile shipping attempting to access the Shannon River. While the battery faces west, the power station is clearly visible, and the two batteries would have been located to be intervisible in order to communicate and co-ordinate any offensive actions. While the Proposed Development will be visible from Kilkerin Fort, it will be partially screened by existing buildings, and it will also blend into the overall existing industrial landscape of the Site.

8.6 Potential Impacts

8.6.1 Construction Phase

Construction of the Proposed Development has the likelihood to impact heritage assets in the following ways:

- Partial or total removal of heritage assets during Site clearance and construction of the Proposed Development and associated features and infrastructure within the Site. This includes the erection of a 55m tall emissions stack which will be constructed on the northern side of the proposed OCGT;

- Impact of any soil regrading on the setting of heritage assets, and damage caused to archaeological deposits caused by concrete walls such as the proposed flood defences; and
- Change to the setting of heritage assets, including visual and noise intrusion, and changes in traffic levels (construction phase only).

The Proposed Development is located on land within the existing SSE Tarbert Power Station site. SSE Tarbert is set on Tarbert Island now occupying the majority of this land mass apart from the eastern extent which contains the pier and slipway serving the ferry between Tarbert and Killimer in County Clare.

Two archaeological sites are recorded within the SSE Tarbert site. These are the battery (KE003-002) and burial (KE003-068) which were both removed by the construction of the Tarbert HFO Power Station during the 1960s. There will be no impact to the battery (KE003-002) and burial (KE003-068).

One unrecorded heritage asset is noted within the boundaries of the Site. This is the Light Keeper's House which was associated with Tarbert Lighthouse (RPS-KY-0891) with both shown on the 1st edition OS map (1841). Both assets appear complete and well maintained. Tarbert Lighthouse (RPS-KY-0891) has been designated as a Protected Structure and is considered regionally important. While the Light Keeper's House is not designated or recorded as a heritage asset, it is an original feature sharing group value and connection with a designated asset. This, and its level of preservation, suggest that it should be considered of medium importance and regional interest.

The Light Keeper's House will not be physically impacted although it is within the Site boundary. The presence of the Proposed Development will create a visual impact to the setting of the Light Keeper's House while the setting of this asset could be temporarily impacted by noise, dust and vibration during the construction works. The setting of the Light Keeper's House is currently that of an industrial complex and subject to associated noise, dust, vibration, and visual intrusion associated with the existing Tarbert HFO Power Station. Additionally, the existing Tarbert HFO Power Station building is larger than the Proposed Development. The change to setting would be such that the special interests or qualities of the Lighthouse Keeper's House are only slightly affected without a noticeable change, leading to a magnitude of impact of Low, leading to a significance of effect of Slight. The quality of the Slight significance of effect is judged as Neutral while its duration is Long-Term.

There are no extant recorded archaeological remains within the footprint of the Proposed Development with the battery (KE003-002) and burial (KE003-068) removed by the construction of the Tarbert HFO Power Station. Tarbert Island would have represented a favourable location for settlement and other activities which is evidenced by the previous presence of the burial (KE003-068). The construction of the battery (KE003-002), lighthouse associated structures and coastguard station will have impacted upon such remains with further impact caused by the construction of the Tarbert HFO Power Station during the 1960s. The nature of this impact would have been Long-Term and Permanent as a result of historic development on the Site.

Given these conditions, no previously unrecorded heritage assets, of likely local importance, will be impacted by groundworks associated with the Proposed Development including the flood defence works and temporary laydown area. The magnitude of impact is assessed as no impact.

The closest recorded heritage asset to the Proposed Development is Tarbert Lighthouse (RPS-KY-0891) which is located 90m to the north. There is the likelihood of negative impact caused by change to the setting of this asset by noise, dust, vibration, and visual intrusion from the construction related activity which could diminish its importance. As with the setting of the associated Light Keeper's House, Tarbert Lighthouse (RPS-KY-0891) is now adjacent to an industrial complex and subject to associated noise, dust, vibration, and visual intrusion associated with the existing Tarbert HFO Power Station. Additionally, the existing Tarbert HFO Power Station building is larger than the Proposed Development. The change to setting would be such that the special interests or qualities of Tarbert Lighthouse (RPS-KY-0891) are only slightly affected without a noticeable change, leading to a magnitude of impact of Low, leading to a significance of effect of Slight. The quality of the Slight significance of effect is judged as Neutral while its duration is Long-Term.

The bastioned battery (KE003-001) is located on the high ground of Massy's Hill overlooking the Shannon Estuary and Tarbert Island. The Proposed Development will be visible from this location but will be set against the larger existing Tarbert HFO Power Station to its east making it less prominent. The change to setting would be such that the special interests or qualities of the bastioned battery (KE003-001) are only slightly affected without a noticeable change, leading to a magnitude of impact of Low, resulting in a significance of effect of Imperceptible. The quality of the Imperceptible significance of effect is judged as Neutral while its duration is Long-Term.

The locally important Planned Landscape of Tarbert Demesne (NIAH 2051) is located to the south of the Proposed Development which will be partially screened by the larger existing Tarbert HFO Power Station as well as other infrastructure including the substation. The change to setting would be such that the special interests or qualities of the Tarbert Demesne (NIAH 2051) are only slightly affected without a noticeable change, leading to a magnitude of impact of **Low**, resulting in a significance of effect of **Imperceptible**. The quality of the Imperceptible significance of effect is judged as **Neutral** while its duration is **Long-Term**.

Tarbert Demesne (NIAH 2051) is a prominent Planned Landscape containing dense mature planting especially along its boundaries. This mature planting effectively blocks views between the Proposed Development and the heritage assets to the south. In particular, the Protected Structured Tarbert House (RPS-KY-0884), the former creamery (RPS-KY-0883), the former Bridewell (RPS-KY-0882) and the former industrial building (RPS-KY-0878) are completely screened from the Proposed Development by this vegetation and there are no views.

The Proposed Development will create additional noise, dust, vibration, and visual intrusion from the construction related activity including traffic using the adjacent road which is the only access to the SSE Tarbert Power Station and the Proposed Development. The presence of Tarbert Demesne (NIAH 2051) will screen the additional noise, dust, and vibration from construction activities on Site from these heritage assets. Additionally, this road serves the Tarbert-Killimer ferry terminal and is subject to large volumes of traffic, including coaches, using the ferry. The settings of these heritage assets are already subject to impact from this traffic.

The additional traffic will be temporary and only associated with the construction phase. It will not affect the ability to understand or appreciate Tarbert House (RPS-KY-0884), the former creamery (RPS-KY-

0883), the former Bridewell (RPS-KY-0882) and the former industrial building (RPS-KY-0878). The change to setting will be such that the special interests or qualities of these assets will not be affected and there will be no impact.

Similarly, views between the designated heritage assets within Tarbert and the Proposed Development are also screened by the dense vegetation of Tarbert Demesne (NIAH 2051) and also intervening buildings. There are no views between Coolahans (RPS-KY-0879), the buildings of Tarbert ACA, Saint Mary's Catholic Church (RPS-KY-0886) and its adjacent Presbytery (RPS-KY-0885) and the Proposed Development while the intervening distance will screen the additional noise, dust, and vibration from construction activities on Site.

The designated heritage assets are located within the centre of Tarbert on the N69 and it is highly likely that construction related traffic will pass them during the construction phase creating additional noise, dust, and vibration. The N69 is a busy road, and the settings of these heritage assets are already subject to impact from traffic using the road. It will not affect our ability to understand or appreciate Coolahans (RPS-KY-0879), the buildings of Tarbert ACA, Saint Mary's Catholic Church (RPS-KY-0886) and its adjacent Presbytery (RPS-KY-0885). The change to setting will be such that the special interests or qualities of these assets will not be affected and there will be no impact.

Saint Brendan's Church (Kilnaughtin) (RPS-KY-0887) is located on Steeple Road to the east of the town and 1.85km to the south of the Site. It will not be impacted by construction related noise, dust and vibration or additional construction traffic. The Proposed Development will be partially visible from the heritage asset although views will be largely screened by intervening features such as Tarbert Demesne (NIAH 2051) and the existing Tarbert HFO Power Station.

The Proposed Development does not feature in critical views to or from Saint Brendan's Church (Kilnaughtin) (RPS-KY-0887) while its current settings already incorporate a prominent industrial feature in the form of the existing Tarbert HFO Power Station. The presence of the Proposed Development will not affect our ability to comprehend or appreciate Saint Brendan's Church (Kilnaughtin) (RPS-KY-0887). The change to setting will be such that the special interests or qualities of these assets will not be affected and there will be no impact.

The ACA of Demesne of Glin Castle and associated features is located on the Coast Road in Co. Limerick 4.43km to the south-east of the Site. There are no views between the associated features, such as Glin Castle, and the Proposed Development with the main views associated with the ACA of Demesne of Glin Castle looking north towards the Shannon Estuary. The ACA of Demesne of Glin Castle does include the N67 Coast Road and adjacent shoreline. The SSE Tarbert Power Station is clearly visible when travelling west through the ACA with the main building and 151m high emissions stacks quite prominent on the skyline. The Proposed Development will merge with these structures when constructed and will not be apparent.

The presence of the Proposed Development will not affect our ability to comprehend or appreciate the ACA of Demesne of Glin Castle. The N67 Coast Road passes through the ACA and will be used by construction traffic passing to and from the Proposed Development during the construction phase. While this traffic could introduce additional noise, dust, vibration, and visual intrusion, the N69 is a main road heading west from Limerick and is already subject to large volumes of traffic including lorries (refer to

Chapter 14, EIAR Volume I for more details). The change to setting will be such that the special interests or qualities of the ACA of Demesne of Glin Castle and its associated assets will not be affected and there will be no impact.

Bessborough House (RPS 483) is located within its own grounds to the immediate west of Killimer. The house is clearly visible from the Shannon Estuary to the south with the best views from the Tarbert/Killimer Ferry. The location of the Proposed Development does not feature in critical views of the heritage asset although the Proposed Development will be visible from Bessborough House (RPS 483). The new structures will initially blend into the overall existing industrial landscape of the Tarbert HFO Power Station which, with the exception of the 151m emissions stacks, blend against higher ground to the south. The shorter 55m emissions stack will be less prominent with the Proposed Development much less apparent on the skyline. The change to setting will be such that the special interests or qualities of Bessborough House (RPS 483) will not be affected and there will be no impact.

Oaklands (RPS 036) is located at Knock in Co. Clare 4.5km to the north-east of the Site. This asset is set on a hill overlooking the Shannon Estuary and SSE Tarbert Power Station is visible. The Proposed Development will be visible, but, initially, it will blend into the overall existing industrial landscape of the power station. The change to setting will be such that the special interests or qualities of Oaklands (RPS 036) will not be affected and there will be no impact.

Similarly, Knock Pier (RPS 589) is located on the northern shore of the Shannon Estuary 4.6km to the north-east of the Site. The Site does not form part of the main view from the pier although it is visible to the south-west. The Proposed Development will be visible, but it will blend into the overall existing industrial landscape of the power station. The change to setting will be such that the special interests or qualities of Knock Pier (RPS 589) will not be affected and there will be no impact.

Kilkerin Fort (RPS 345) is located at Lackyle North on a peninsula 2km to the north-east of the Site. This battery was intended with the former Tarbert Island Battery (KE003-002) to provide a crossfire against any hostile shipping attempting to access the Shannon River. It was deliberately situated to be intervisible with the former Tarbert Island Battery (KE003-002) which is, now, SSE Tarbert Power Station. The existing Tarbert HFO Power Station is clearly visible and a prominent feature on the skyline. While the proposed OCGT will be visible from Kilkerin Fort (RPS 345), it will be partially screened by existing buildings, and it will also blend into the overall existing industrial landscape of the SSE Tarbert site.

The change to setting will be such that the special interests or qualities of Kilkerin Fort (RPS 345) will be slightly affected without a noticeable change, leading to a magnitude of impact of **Low**, leading to a significance of effect of **Slight**. The quality of the Slight significance of effect is judged as **Neutral** while its duration is **Long-Term**.

8.6.2 Operational Phase

Significant effects for the operation of the Proposed Development derive from changes to the setting of heritage assets. These largely mirror the effects assessed for the permanent presence of the Proposed Development as detailed in the assessment of the construction phase. There would be no change to the effects assessed for the designated assets identified during the construction phase within the wider

study area due to the permanent presence of the Proposed Development during the operational phase or its operation.

8.6.3 Do Nothing Scenario

The 'do nothing' scenario would not result in any significant changes to the baseline cultural heritage resource. The magnitude of impact would be no change, leading to a significance of effect of Imperceptible.

If the Proposed Development were not to proceed, environmental monitoring and site management would continue, as required under the conditions of the existing Tarbert HFO Power Station permit.

8.7 Mitigation Measures

8.7.1 Construction Phase

The assessment has determined that the Proposed Development is located within an industrial site and industrial setting which has been previously disturbed by the construction works which commenced in the 1960s. Any archaeological remains, including the battery (KE003-002) and burial (KE003-068), which were, or may have been present, will have been destroyed / removed during these historic works associated with the construction of Tarbert HFO Power Station.

It is, therefore, determined that the Proposed Development will not physically impact upon previously unknown archaeological remains. Given this, no archaeological mitigation is required during the construction phase.

The Proposed Development will have not have a significant effect upon the settings of designated heritage assets during construction. Consideration of visual intrusion and noise impacts are addressed in Chapter 10 (Landscape and Visual), Chapter 11 (Noise and Vibration) and Chapter 14 (Traffic), while embedded mitigation measures are included within the Proposed Development design.

8.7.1.1 Embedded Mitigation to be Adopted During Construction Phase

During the construction phase procedures will be adopted, as described in the Construction Environmental Management Plan (CEMP in EIAR Volume II Appendix 5A) and in Chapter 5 (Description of the Proposed Development), to reduce the impact of noise, dust, and vibration during construction. Toolbox talks will be undertaken when necessary to inform construction supervision staff and site operatives of the requirements.

8.7.2 Operational Phase

Appropriate measures will have been implemented at construction phase to avoid or reduce adverse visual impacts. No further mitigation will be required at the operational phase (including maintenance periods).

8.7.3 Decommissioning Phase

Full details of the decommissioning works will be presented in a Decommissioning Plan (including a Decommissioning Environmental Management Plan) to be produced and agreed with the EPA as part

of the Industrial Emissions Licence (IEL) and site surrender process for the facility at the end of the design life.

Temporary effects arising from the process of decommissioning of the Proposed Development are considered to be of a similar nature and duration to those temporary effects arising from the construction process and therefore have not been considered separately in this chapter.

8.8 Residual Impacts

This sub-section describes the resultant residual significance of effects on cultural heritage assets, following mitigation. This assessment has identified that, after mitigation, there would be impacts upon the settings of a number of heritage assets, resulting in minor effects upon the setting of five heritage assets, two of which are considered of low interest and three of which are assets of medium interest. Two of the assets of medium interest are designated -Tarbert Lighthouse (RPS-KY-0891) and Kilkerin Fort (RPS 345) while one is unrecorded but also considered of regional significance – Light Keeper's House. These three assets are considered of regional significance. interest. None of these effects are significant.

8.8.1 Assets of Medium Interest

There are three assets considered to be of medium value, comprising two Protected Structures -Tarbert Lighthouse (RPS-KY-0891) and Kilkerin Fort (RPS 345) and one unrecorded asset – Light Keeper's House. No specific mitigation for setting has been proposed in this chapter, as it is noted that appropriate mitigation for the construction phase is addressed in Chapter 10 (Landscape and Visual) and Chapter 14 (Traffic). The residual effect would remain Long-Term and Slight, leading to a Neutral effect, which is Not Significant.

8.8.2 Assets of Low Interest

The remaining two assets are non-designated and considered of low interest. They comprise one archaeological asset, bastioned battery (KE003-001), and one Historic Garden, Tarbert Demesne (NIAH 2051), recorded on the NIAH. No specific mitigation for setting has been proposed in this chapter, as it is noted that appropriate mitigation for the construction phase is addressed in Chapter 10 (Landscape and Visual) and Chapter 14 (Traffic). The residual effect would remain Long-Term, Imperceptible and Neutral.

8.9 Cumulative Impacts

There is the potential for cumulative effects to occur in combination with other sources in the local area. A desktop planning history search using the Kerry County Council (KCC), Limerick County Council (Limerick Co. Co.) and Clare County Council (Clare Co. Co.) Online Planning Systems noted ten planning applications which could combine with the Proposed Development to create a cumulative impact upon heritage assets.

Of these ten planning applications, three are within the SSE Tarbert site, itself. The first of these concerns works to the Tarbert substation compound and 220Kv underground cabling under planning application 23350. This application is located within the Site occupying 6.9ha and is located directly

adjacent to the Proposed Development. Planning determination has not been issued and further information requested by An Bord Pleanála regarding the application has been submitted by the applicant.

There is the potential that construction of the application 23350 could coincide with the construction of the Proposed Development creating cumulative impact from construction noise, dust, and vibration upon the settings of heritage assets as well settings impact from combined traffic activities. No specific mitigation for setting has been proposed in this chapter, as it is noted that this impact is temporary and limited to the construction phase. The significance of the cumulative effect is judged to be Low.

The second application within the SSE Tarbert Power Station is the Temporary Emergency Generation (TEG) project (ABP-315838-22) which will be located c.170m to the south-west of the Proposed Development. It will comprise three open cycle gas turbine units including 30m flue gas stacks (and balance of plant); liquid fuel storage and offloading facility; connection equipment; and connection to the existing electrical substation. The TEG will be nearing completion and being commissioned by the time the construction starts on the Proposed Development (subject to the grant of planning consent) so there will be limited cumulative impact from construction noise, dust, and vibration upon the settings of heritage assets. Similarly, there will be no impact from combined construction traffic activities.

The TEG will remain in place with an approximate two or three-year operational overlap with the Proposed Development depending on when planning permission is granted and construction commences. Its three 30m flue gas stacks could combine with the 55m high emissions stack of the Proposed Development to create an impact upon the settings of the heritage assets particularly the Tarbert Lighthouse (RPS-KY-0891), Light Keeper's House and bastioned fort (KE003-001). These stacks will be largely screened by the existing infrastructure including the Tarbert HFO Power Station building. The TEG is a temporary project which will be removed after 2028 when any cumulative impact will cease. The significance of the cumulative effect is judged to be Low.

The third application within the SSE Tarbert Power Station is a battery storage facility (18392) with a total site area of up to 2.2278ha, to include 50 no. self-contained battery container units with associated HVAC cooling units, 13 converter and 13 step up transformer container units, associated compound cabling and ducting, a grid transformer, a single storey substation / control building with welfare facilities, a cable route grid connection to the existing ESB substation building, maintenance lighting, security fencing, a CCTV monitoring system, and all associated ancillary infrastructure on lands within the Tarbert generating facility.

A ten-year planning permission is being sought to construct this development so there is the potential that construction of the battery storage facility could coincide with the construction of the Proposed Development creating cumulative impact from construction noise, dust, and vibration upon the settings of heritage assets as well settings impact from combined traffic activities. No specific mitigation for setting has been proposed in this chapter, as it is noted that this impact is temporary and would be limited to the construction phase. The significance of the cumulative effect is judged to be Low.

Four of the applications (18878, 19115, 20850 and 21549) relate to various elements of an electricity power generating peaking plant and battery energy storage system facility on a site 1.8 km to the south-west of the Proposed Development. Elements of this development have already been constructed which

is located on a site located on higher ground. Given the distance between these two developments, which includes intervening mature tree plantation associated with Tarbert Demesne (NIAH 2051), it is unlikely that construction noise would combine to create a cumulative impact upon the settings of the heritage assets within the study area.

The remaining three applications all relate to the Moneypoint Power Station located on the opposite side of the Shannon Estuary within County Clare approximately 4km to the northwest of the Proposed Development. The earliest planned of these is a 7.5MW capacity battery storage facility (application 18520) within a secured compound, on a 0.4ha site. The distance between this application and the Proposed Development means it is unlikely there would be any cumulative impact as it is unlikely that construction noise would combine to create a cumulative impact upon the settings of the heritage assets within the study area.

The second application within Moneypoint Power Station is a 300 to 400 MVA (electrical rating) synchronous condenser (application 19746) which will be situated in a 1.8 ha site. The distance between this application and the Proposed Development means it is unlikely there would be any cumulative impact as it is unlikely that construction noise would combine to create a cumulative impact upon the settings of the heritage assets within the study area.

The final application (2332) within Moneypoint Power Station relates to land-based Site Investigations (SI) works comprising of boreholes and trial pits across the site. These will create very limited ground disturbance and noise with the SI works completed before the Proposed Development commences. There will be no cumulative impact.

8.10 Summary

The Proposed Development comprises the construction of an OCGT unit within the SSE Tarbert site. This is an industrial location set on Tarbert Island which has undergone previous disturbance being previously the location of a 19th century artillery battery (KE003-002). The assessment has determined that the Proposed Development is located within this industrial setting, any archaeological remains which may have been present will have been disturbed and / or destroyed during historic works associated with the construction of the existing Tarbert HFO Power Station. No archaeological mitigation is required.

One previously unrecorded heritage asset is noted within the boundaries of the Proposed Development. This is a Light Keeper's House which dates to the 19th century and is associated with Tarbert Lighthouse (RPS-KY-0891). While not officially recorded as a heritage asset, this building has been judged through professional opinion to be of medium importance and regional interest. This asset will not be physically impacted, although its setting will be impacted by the presence of the Proposed Development.

No specific mitigation for setting has been proposed in this chapter, as it is noted that appropriate mitigation for the construction phase is addressed in Chapter 10 (Landscape and Visual) and Chapter 14 (Traffic). The residual effect would remain Long-Term and Slight and Not Significant.

The height of the proposed emissions stack for the Proposed Development will be 55m in height, which could create a visual effect to the settings of heritage assets within the surrounding area. This

assessment has identified that, after mitigation, there would be minor effects upon the setting of four further heritage assets, of which two are designated. These designated assets are considered of medium importance. None of these effects are significant.

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SSE Tarbert Next Generation Power Station

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Table of Contents

9.	Biodiversity	9-1
9.1	Introduction	9-1
9.2	Legislation, Policy and Guidance	9-1
9.3	Methodology	9-3
9.4	Baseline Environment	9-13
9.5	Potential Impacts	9-23
9.6	Mitigation Measures	9-40
9.7	Residual Impacts	9-42
9.8	Cumulative Impacts	9-43
9.9	Summary	9-51

Tables

Table 9.1: Summary of consultations	9-5
Table 9.2: Desk study data sources	9-6
Table 9.3: Ecological features excluded from field survey	9-6
Table 9.4: Summary of species surveys completed for the Proposed Development	9-7
Table 9.5: Example of ecological importance	9-10
Table 9.6: Statutory designated nature conservation sites	9-13
Table 9.7: Records of rare plant species from the NBDC Dataset	9-17
Table 9.8: Records of notable invertebrate species from the NBDC dataset.	9-21
Table 9.9: Records of invasive plant species from the NBDC dataset.	9-21
Table 9.10: Records of invasive animal species from the NBDC dataset	9-22
Table 9.11: Importance of ecological features	9-24
Table 9.12: Projects within 5km of the Proposed Development which have the potential to act in-combination.	9-44

Appendices (Refer to EIAR Volume II)

Appendix 9A: Zone of Influence Informing the Assessment

Appendix 9B: Natura Impact Statement (NIS)

Appendix 9C: Bat Report

Appendix 9D: Breeding Birds

Appendix 9E: Wintering Birds Report

Figures (Refer to EIAR Volume III)

Figure 9.1: European site within the Zol of the Proposed Development.

Figure 9.2: Fossitt Habitats within the Site.

9. Biodiversity

9.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) assesses the potential impacts and effects of the construction, operation, and decommissioning phases of the Proposed Development (as presented in EIAR Volume I Chapter 5) on the ecological environment. The 'Site' refers to the redline boundary within which the Proposed Development will be situated, and which lies within the existing SSE Tarbert site.

This chapter describes and considers terrestrial habitats and species and those marine species including bird species that forage in the marine environment, which could be impacted by the Proposed Development. Throughout this chapter, the term 'ecological feature' is used to refer to protected and notable nature conservation sites, habitats, and floral and faunal species as defined in Section 9.3.1.

Where appropriate, it provides details of committed mitigation and / or enhancement measures identified to avoid or reduce, or if necessary, offset for adverse effects on ecological features.

An Appropriate Assessment (AA) Screening report and Natura Impact Statement (NIS) have also been submitted as part of this planning application (Appendix 9B EIAR Vol II) which describe the assessment conducted to determine whether there could be adverse effects on the integrity of European sites, due to the construction, operation and / or decommissioning of the Proposed Development. Where appropriate, reference is made in this chapter to analysis presented in the AA Screening report and NIS.

Throughout this chapter, species are given their common and scientific names when first referred to and their common names only thereafter. All distances are cited as the shortest distance unless otherwise specified.

9.2 Legislation, Policy and Guidance

9.2.1 Relevant Legislation

The Ecological Impact Assessment (EcIA) presented in this chapter has been carried out in accordance with the following relevant legislation:

- Council Directive 92/43/EEC (as amended) of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the 'Habitats Directive').
- Directive 2009/147/EC (as amended) on the conservation of wild birds (the 'Birds Directive').
- Directive 2000/60/EC establishing a framework for Community action in the field of water policy (the 'Water Framework Directive').
- EC Regulation 1143/2014 on the prevention and management of the introduction and spread of invasive alien species (the 'Invasive Alien Species Regulations').
- Convention on Wetlands of International Importance ('Ramsar Convention').

- The Planning & Development Act 2000 (as amended) (the 'Planning Act').
- European Communities (Bird and Natural Habitats) Regulations 2011 (as amended) (the 'Habitats Regulations').
- The Wildlife Act 1976 and the Wildlife (Amendment) Act 2000 (together known as the 'Wildlife Acts').
- Flora (Protection) Order 2022 (S.I. No. 235 of 2022 (the 'Flora Protection Order' (FPO))); and
- EC Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009).

9.2.2 Relevant Planning Policy and Guidance

9.2.2.1 Project Ireland 2040: National Planning Framework

The *Project Ireland 2040: National Planning Framework* (NPF)¹ sets out the Government's planning policies for Ireland and how these should be applied. The NPF sets out that to achieve sustainable development, the planning system must incorporate an environmental objective, which should include:

- integrated planning for green infrastructure and ecosystem services.
- enhancing the conservation status and improve the management of protected areas and protected species.
- use natural resources prudently.
- minimising waste and pollution; and
- mitigating and adapt to climate change, including moving to a low carbon economy.

9.2.2.2 National Biodiversity Action Plan 2017-2021

The *National Biodiversity Plan 2017-2021*² for Ireland outlines six main objectives to meet commitments under the Convention on Biological Diversity (CBD) and EU Biodiversity Strategy. These objectives include:

- mainstream biodiversity into decision-making across all sectors.
- strengthen the knowledge base for conservation, management and sustainable use of biodiversity.
- increase awareness and appreciation of biodiversity and ecosystem services.
- conserve and restore biodiversity and ecosystem services in the wider countryside.
- conserve and restore biodiversity and ecosystem services in the marine environment.
- expand and improve management of protected areas and species; and
- strengthen international governance for biodiversity and ecosystem services.

¹ GOI (2018). *Project Ireland 2040: National Planning Framework*.

² DCHG (2017). *National Biodiversity Plan 2017-2021*.

9.2.2.3 Kerry County Development Plan 2022-2028

The *Kerry County Development Plan (CDP) 2022-2028*³ sets out an overall strategy for the proper planning and sustainable development within the functional area of County Kerry.

Several policies are relevant to biodiversity and the Proposed Development, including:

- *Objective 11-1: Comply with relevant EU and national legislation, including the requirements of the EU Birds and Habitats Directives.*
- *Objective 11-2: Maintain the nature conservation value and integrity of EU and nationally designated sites.*
- *Objective 11-3: Conserve, manage and where possible enhance the County's natural heritage including all habitats.*
- *Objective 11-22: Encourage and facilitate the retention and creation of features of local biodiversity value.*
- *Objective 11-16: Control of Invasive Alien Species.*
- *Objective 11-31: Air and noise pollution; and*
- *Objective 11-42: Lights and biodiversity.*

9.2.2.4 County Kerry Biodiversity Action Plan 2022-2028

The aim of the *County Kerry Biodiversity Action Plan (BAP) 2022-2028* is to conserve, protect and enhance biodiversity, work with a range of stakeholders to achieve this, and increase awareness and appreciation of biodiversity within the county council and the community.

9.2.2.5 Other Guidance

Additional guidance that has been adhered to in the preparation of this EclA of the Proposed Development comprises:

- CIEEM (2019). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine.*
- CIEEM (2021). *Advisory Note: Ecological Assessment of Air Quality Impacts.*
- Holman et al., (2019). *A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites.*

9.3 Methodology

9.3.1 Target Ecological Features

For the purposes of all desk study and field survey, the target ecological features of this EIA comprised:

- designated or proposed nature conservation sites at international, national or local levels.

³ Kerry Co. Co. (2022). *Kerry County Development Plan 2022-2028.*

- habitats and species listed on Annexes I and II, respectively, of the Habitats Directive, which listing indicates importance in a European context and affords protection if designated as Qualifying Interests (QI) of SAC.
- species listed on Annex IV of the Habitats Directive, which are known as European Protected Species (EPS) and are subject to strict protection anywhere they occur.
- species listed on Annex I of the Birds Directive, which listing indicates importance in a European context and affords protection where designated as Special Conservation Interest (SCI) of SPA.
- species listed on the Wildlife Acts.
- Red-listed and Amber-listed birds in the Birds of Conservation Concern in Ireland (BoCCI)⁴;
- plant species listed on the FPO.
- species and habitats listed on the *National Biodiversity Action Plan 2017-2021*.
- species that are Nationally Rare, Nationally Scarce or listed in Red Data Lists, which are published by the National Parks and Wildlife Service (NPWS) in collaboration with relevant Northern Irish agencies (e.g., Marnell *et al.*, 2019; Regan *et al.*, 2010, King *et al.*, 2011, Lockhart *et al.*, 2012, Nelson *et al.*, 2011; and Wyse-Jackson *et al.*, 2016).
- invasive non-native species of plants and animals listed on the Third Schedule of the Habitats Regulations (hereafter referred to as 'scheduled invasive species'), those of EU concern under the EU Invasive Alien Species Regulation, and those listed by the National Biodiversity Data Centre (NBDC) as High Risk in Ireland.

Other species or habitats, that may be rare, scarce or otherwise notable, were included where deemed appropriate through available information and / or professional judgement.

9.3.2 Zone of Influence

The 'zone of influence' (Zol) of the Proposed Development is the area over which ecological features may be subject to significant effects as a result of its construction, operation, decommissioning and / or associated activities. The Zol can extend beyond the boundary of the Site, for example where there are hydrological links extending beyond the Site.

The Zol will vary for different ecological features depending on their sensitivity to an environmental change. It is therefore appropriate to identify different Zol for different ecological features, including designated sites, habitats, and species, see Appendix 9A for the Zol used for this assessment.

As recommended by CIEEM guidance⁵, professionally accredited or published studies, where available, were used to determine the likely Zol, as well as professional judgement. However, CIEEM guidance⁶ also highlights that establishing the Zol should be an iterative process and can be informed by further

⁴ Gilbert *et al.*, (2021). *Birds of Conservation Concern in Ireland 2020-2026*.

⁵ CIEEM (2019). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*.

⁶ CIEEM (2019).

desk study and field survey. Where limited information was available, the Precautionary Principle was applied and a Zol estimated on that basis.

The study areas used for the desk study and field survey, which are described below and in Appendices 9B - 9E EIAR Volume II were designed to allow for sufficient data to be collected to establish the baseline condition of ecological features within the Zol of the Proposed Development. The study areas were therefore generally precautionary.

9.3.3 Consultation

The assessment of impacts from the Proposed Development on ecological features has been informed and influenced by consultation held with NPWS, a statutory stakeholder. A summary of the consultation held, the information / recommendations provided, and details of how this EIA has responded to their feedback is provided in Table 9.1.

Table 9.1: Summary of consultations

Consultee	Date of Consultation	Information / Recommendations Provided	Action taken by this EIA in response
NPWS Regional Management	10/10/2023	Details on ecological receptors in the area, specifically impacts to Birds Directive Schedule I listed species such as the white-tailed sea eagle <i>Haliaeetus albicilla</i> .	Considered all information provided in detail and assessed the potential for impacts to such species.

9.3.4 Desk Study

A desk study was carried out to identify relevant nature conservation designations, and records of protected and notable habitats and species potentially relevant to the Proposed Development. The desk study areas were defined using a stratified approach based on the Zol of the Proposed Development on different ecological features. Accordingly, the desk study sought to identify:

- international nature conservation designations – Special Area of Conservation (SAC) and Special Protection Area (SPA), including candidate designations (cSAC) within the Zol of the Proposed Development (up to 135km to account for mobile marine features) in accordance with Office of the Planning Regulator (OPR) guidance⁷.
- national statutory nature conservation designations and proposed designated sites within 2km of the Site.
- local nature conservation designations within 2km of the Site; and
- records of protected and notable habitats and species within 2km of the Site.

The desk study was carried out using the sources detailed in Table 9.2.

⁷ OPR (2021). OPR Practice Note PN01: Appropriate Assessment Screening for Development Management.

Table 9.2: Desk study data sources

Data Source	Date Accessed	Data Obtained
Environmental Protection Agency (EPA) maps: https://gis.epa.ie/EPAMaps/	27 June 2023	- International statutory designations within the Zol. - Other statutory designations within 2 km. - Local nature conservation designations within 2 km. - Information on watercourses, water quality, soils, and geology.
NPWS Protected Sites in Ireland: https://www.npws.ie/protected-sites	27 June 2023	Details on relevant statutory and non-statutory designations.
National Biodiversity Data Centre: https://maps.biodiversityireland.ie/	27 June 2023	- Biological records within 2 km. - Otter and badger records within the same 10 km grid square in which the Site is located (R04). - High Risk invasive species in Ireland.
The Status of EU Protected Habitats and Species in Ireland (Article 17 Report): https://www.npws.ie/publications/article-17-reports/article-17-reports-2019	27 June 2023	Information on the status of EU protected habitats and species in Ireland.
Irish Red Lists	27 June 2023	Conservation status of plants, amphibians, reptiles, freshwater fish, invertebrates, birds and terrestrial mammals (including bats).
Ordnance Survey Ireland maps and aerial photography: https://www.osi.ie/	27 June 2023	Habitats and connectivity relevant to interpretation of planning policy and potential protected / notable species constraints.

9.3.5 Field Survey

9.3.5.1 Scope of Field Survey

The scope of survey described in this chapter was informed by the guidance contained within published documents referenced in Section 9.2 and in Appendix 9C - 9E, EIAR Volume II, and on the results of the desk study and the field survey carried out, to establish the baseline ecological conditions.

Based on an initial desk study, including a review of biological records and aerial imagery of the Site, a number of ecological features were excluded from targeted field survey, as set out in Table 9.3.

Table 9.3: Ecological features excluded from field survey

Ecological Feature(s)	Reason(s) for Exclusion from Field Survey
Irish hare <i>Lepus timidus hibernicus</i> , hedgehog <i>Erinaceus europaeus</i> , pygmy shrew <i>Sorex minutus</i> , Irish stoat <i>Mustela erminea Hibernica</i>	Irish hare is present on Site, and it is possible that hedgehog and Irish stoat may occur on Site and / or within the surrounding area. It can be assumed that they are present, and effects of the Proposed Development will be mitigated through standard measures.
Common lizard <i>Zootoca vivipara</i>	The Site has the potential to support this species, which is relatively common and widespread. Common lizard may occur in the grassland and along road verges. Standard mitigation measures to avoid or reduce or, if necessary, compensate for effects of the Proposed Development on this species will be implemented.

A description of the methods adopted for all ecological field surveys is provided under the following sub-headings / accompanying appendices. All ecological field surveys were carried out by experienced AECOM ecologists.

9.3.5.2 Habitat and Flora Survey

Survey for habitats and rare, protected and invasive flora were carried out in June, July and August 2023 by suitably qualified AECOM ecologists with extensive survey experience. The Site habitats were classified according to *A Guide to Habitats in Ireland*⁸. Notes were made for each habitat of dominant, typical and notable plant species, and any relevant ecological characteristics (particularly where relevant to habitat condition), which reflect conditions at the time of survey were recorded. Habitats were also visually assessed to determine their potential value for nesting birds, invertebrates, and other taxa.

Habitat types were mapped in the field with the ESRI Field Maps application on Android tablets. By using the GPS inbuilt within the device and in context with recognisable features on the ground visible from downloaded orthophotography, this allows for accurate locational data of evidence to be recorded. Nomenclature for plant species followed that of Stace guidance⁹.

9.3.5.3 Protected and Notable Species Surveys

Full details of the methods used when conducting surveys for bats and birds for the Proposed Development are provided in Appendices 9C – 9E inclusive, EIAR Volume II, respectively. A summary of the scope of protected / notable species surveys is provided in Table 9.4.

Table 9.4: Summary of species surveys completed for the Proposed Development

Ecological Survey	Date of Survey	Scope of Survey	Appendix
Preliminary Roost Assessment	26 / 27 June 2023	A ground-based, external assessment of the bat roost suitability of all trees and buildings which will be removed. Trees and buildings outside of this area are not expected to be impacted by the Proposed Development and therefore were not surveyed.	Appendix 9C EIAR Vol II
Walked bat transect	07 June 2023 26 June 2023 30 August 2023	A walked bat activity transect route was devised to cover typical examples of all habitats suitable for bat foraging and commuting within the Site, and areas immediately adjacent to the Site, including woodland to the east of the Site, and the road to the south of the inlet leading to the National Oil Reserves Agency (NORA) site.	
Otter <i>Lutra lutra</i> survey	07 June 2023 08 June 2023 30 August 2023	Walkover survey of the Site and coastal sections immediately beyond the Site boundary	Not applicable, described in this chapter.
Badger <i>Meles meles</i> survey	07 June 2023 08 June 2023 30 August 2023	Walkover survey within the Site, and immediately adjacent area.	Not applicable, described in this chapter.
Breeding bird survey	08 June 2023 27 June 2023	Walkover survey to record the breeding bird assemblage within the Site and immediately adjacent areas.	Appendix 9D EIAR Vol II

⁸ Fossitt (2022).

⁹ Stace (2019).

Ecological Survey	Date of Survey	Scope of Survey	Appendix
Wintering bird survey	15 November 2022 16 November 2022 14 December 2022 15 December 2022 24 January 2023 25 January 2023 15 February 2023 15 February 2023 06 March 2023 07 March 2023	Walkover survey to record the wintering bird assemblage within the Site plus a 500 m buffer. Ten survey visits were made between November 2022 and March 2023 inclusive, twice per month to take in high and low tides.	Appendix 9E EIAR Vol II
Marine mammals	15 February 2023 7 & 8 June 2023 26 & 27 June 2023 30 & 31 August 2023	During surveys and time spent on Site. Frequent scans were made over the surrounding coastline and open water to make checks for marine mammals.	Not applicable, described in this chapter.

Otter Survey

Otter surveys were carried out on 7 June 2023 and 30 August 2023 within the Site, and surrounding coastal habitat within the survey area, as far as safe access permitted. The survey followed guidance in published literature¹⁰.

Evidence of otter searched for included refuges (holts and lie-ups¹¹), spraints (faeces), footprints, trails and foraging signs. Where found, spraints were recorded as fresh, recent or old, according to their apparent age.

Any evidence of otter found during the survey was mapped on handheld Android tablets and accompanying field notes were taken.

Badger Survey

Badger surveys were carried out within the Site and immediately adjacent suitable habitats, as far as safe access permitted, on 07 June 2023 and 30 August 2023. The survey followed guidance in published literature¹².

Evidence searched for included setts, spoil heaps, bedding, guard hairs, latrines, footprints, trails, scratch marks and foraging activity.

Badger evidence was mapped with the aid of aerial photography and GPS, with accompanying field notes. If present, setts were classed as main, annex, subsidiary or outlier, where possible, and holes described as well-used, partially used or disused.

9.3.6 Ecological Impact Assessment

The method employed for assessment of impacts on ecological features followed that recommended by the Chartered Institute of Ecology and Environmental Management (CIEEM) in the *Guidelines for Ecological Impact Assessment in the UK and Ireland*¹³. CIEEM is the leading professional membership

¹⁰ Chanin (2003). *Monitoring the Otter Lutra lutra*, *Conserving Natura 2000 Rivers Monitoring Series No. 10*.

¹¹ A holt is a well-enclosed otter refuge, such as a burrow. A lie-up (also known as a 'couch') is semi-enclosed and of lesser importance.

¹² Harris *et al.*, (1989).

¹³ CIEEM (2019).

body for ecologists in both the UK and Ireland. It provides advice to government, upholds standards in professional conduct, and promotes best practice.

The principal steps involved in the CIEEM approach can be summarised as:

- baseline conditions are determined through targeted desk study and field survey to identify ecological features that are both present and might be affected by the Proposed Development (both those likely to be present at the time works begin, and for comparison, those predicted to be present at a set time in the future).
- the importance of identified ecological features is evaluated to place their relative biodiversity and nature conservation value into a geographic context, determining those that need to be considered further within the impact assessment.
- the potential impacts of the Proposed Development on relevant ecological features are described, considering established best practice, legislative requirements and embedded design measures.
- the likely effects (adverse or beneficial) on relevant ecological features are assessed and, where possible, quantified.
- measures to avoid or reduce (or, if necessary, compensate for) any predicted significant effects, if possible, are developed in conjunction with other elements of the design (including mitigation for other environmental disciplines).
- any residual effects of the Proposed Development and their significance are reported; and
- scope for enhancement measures is considered.

Only those ecological features that are ‘important’ and that could be significantly affected by the Proposed Development require detailed assessment – *“it is not necessary to carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable”*¹⁴. This is consistent with the EIA Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU) which requires investigation of likely significant effects, as accordingly emphasised by the EPA guidelines¹⁵.

Existing data and criteria are considered when determining the importance of ecological features. Where these are lacking, it is necessary to apply professional judgement. Factors considered include:

- rarity, endemism, mobility and geographic range (particularly if this changing).
- size / extent, rate of decline and vulnerability.
- typicalness, species-richness, habitat structure and connectivity/fragmentation.
- function / value to other features (e.g., habitats of notable species or buffers against impacts); and
- restoration potential.

¹⁴ CIEEM (2019).

¹⁵ EPA (2022). *Guidelines on the information to be contained in Environmental Impact Assessment Reports*.

Compliance with legislation is relevant but, along with priority listing, does not necessarily translate to importance. For example, a transitory roost of a single bat would not be afforded the same importance as a regularly occurring maternity roost, although legal obligations must still be met, and areas of priority habitat could be unfavourably small or in poor condition and not practically restorable.

The importance of ecological features is described using a geographic scale. Examples of the types of ecological features which may fall into each category are given in Table 9.5, which is adapted from CIEEM guidelines¹⁶. For the purposes of this assessment 'Local' is defined as the area within 5km of the Site.

Table 9.5: Example of ecological importance

Importance	Examples
International	Internationally designated nature conservation site (or candidate/proposed international site), or site satisfying criteria for such designation, or feature essential to maintaining such sites. Sustainable area (or part of a larger sustainable area) of best examples of Annex I habitat¹. A regularly occurring internationally significant population (e.g. 1% of the national population, or potentially less for critical parts of wider populations or those at a critical life-cycle stage) of internationally important species listed on Annex I of the Birds Directive or Annex II of the Habitats Directive.
National	Nationally designated nature conservation site (or proposed such site), or site satisfying criteria for such designation. Sustainable area of good quality Annex I habitat not deemed to be of international importance, or of national priority habitat, which is a significant proportion of the resource. Regularly occurring nationally significant population (e.g., 1% of the national population, or potentially less for critical parts of wider populations or those at a critical life-cycle stage) of species listed or protected under the Wildlife Acts or Red Data lists, or site supporting one.
County	County designated nature conservation site (or proposed such site). Sustainable area of Annex I habitat or national priority habitat not deemed to be of higher importance (e.g., lower quality, highly fragmented, small and / or low restoration potential), or priority habitat under a Local Biodiversity Action Plan if this exists and applies at county level. Regularly occurring County significant population (e.g., 1% of county resource, or potentially less for critical parts of wider populations or those at a critical life-cycle stage) of species listed or protected under the Habitats/Birds Directives, Wildlife Acts, Red Data lists or Local Biodiversity Action Plan (if this exists and applies at county level), or site supporting one.
Local	Priority habitat of insufficient size or quality for higher importance or degraded with low restoration potential. Habitat providing significant biodiversity or important ecological corridors in a local context. Small sustainable population of notable species not qualifying for higher importance or uncommon locally.
Site	Common, heavily managed or modified habitat, and common and widespread species.

¹ Habitat listed on Annex I of the Habitats Directive.

Under CIEEM¹⁷ guidance there is a clear distinction between 'impact' and 'effect'. An impact is an action on an ecological feature (e.g., hedgerow removal; loss of a bat roost). An effect is the outcome of that impact on an ecological feature (e.g., effect of hedgerow loss on breeding birds; effect of bat roost loss on the conservation status of the bat species).

Impacts may occur during the construction, operation, and decommissioning phases of a development. They may be direct or indirect (also termed 'secondary'). Direct impacts are attributable to an action

¹⁶ CIEEM (2019).

¹⁷ CIEEM (2019).

associated with a development. Indirect impacts are often produced away from a development or as a result of other initial impacts.

Likely impacts / effects are characterised using those parameters below that are necessary to understand them:

- **direction / quality** – whether the impact will have a beneficial, neutral, or adverse effect.
- **magnitude** – the ‘size’, ‘amount’ or ‘intensity’ of an impact, described in quantitative terms as far possible.
- **extent** – the spatial or geographical area or distance over which the impact or effect occurs.
- **duration** – the time over which an impact/effect is expected to last prior to recovery or replacement (if possible) of the feature. Where appropriate, ecological aspects such as lifecycles are considered. The duration of an effect may be longer than the duration of an activity or impact.
- **timing and frequency** – timing is important since an effect might not occur if critical seasons or life stages are avoided. Frequency considers repetition of an activity, which may result in a greater effect; and
- **reversibility** – whether the effect is temporary or permanent. A temporary impact/effect is one from which recovery is possible or for which effective mitigation is possible and enforceable. A permanent effect is one from which recovery is either not possible or cannot be achieved within a reasonable timescale (in the context of the feature being assessed).

Consideration is given to conservation objectives, whether processes within sites will be altered, effects on habitats and species population size / viability, and whether these will have an effect on conservation status. Conservation status is determined by the abundance and distribution of species, and the extent, structure and function, and typical supported species of habitats.

Consideration is also given to cumulative effects, since impacts acting in combination may have a cumulative effect exceeding that of the separate impacts. Cumulative effects may arise from a combination of impacts from the Proposed Development itself (e.g., impacts at the construction and operation stages), or the combined impacts from different developments.

An effect (positive or negative) is significant at a specified geographical level if it affects the ecological integrity of a site or ecosystem or the conservation status of a species or habitat. If not significant at the level it was considered important, an effect could be significant at a lower geographic level (for example, an effect on a nationally-important species may not be significant to the national population). These assessments are based on quantitative evidence where possible, and as necessary through professional judgement.

Initially, the effect significance does not consider mitigation or compensation unless it is part of the embedded approach. The residual effect significance takes such measures into account, with the aim that, wherever possible, residual effects are not significant or are significant at a lower geographic level.

The CIEEM guidelines¹⁸ advises that where there is reasonable doubt and a conclusion of no significant effect cannot be robustly reached, this uncertainty should be acknowledged and a significant effect assumed, in line with the precautionary principle.

As stated above, the CIEEM methodology for EclA advises that the significance of effects on ecological features should be assessed at geographic scales. However, in order to ensure consistency with other chapters in this EIAR, a conclusion of 'Significant' or 'Not Significant' in EIA terms has been adopted to facilitate interpretation of ecological effects which a) require mitigation, and/or b) which are sufficiently great that they may be a material consideration when assessing the planning application for the Proposed Development. In this chapter, therefore, any effects on ecological features which are considered to be of County significance or greater are taken to be Significant in EIA terms. Effects which are of Local or Site significance are taken to be Not Significant in EIA terms.

9.3.7 Approach to Mitigation

Where impacts on relevant ecological features are predicted, the approach to mitigation engages the following hierarchy:

1. Avoid ecological features where possible.
2. Minimise impact by design, method of working or other measures, for example by enhancing existing features by changes to maintenance regime.
3. Compensate for significant residual impacts (e.g., by providing suitable habitats elsewhere).

This hierarchy requires the highest level to be applied where possible. Only where this cannot reasonably be adopted are lower levels considered, giving rationale including sufficient detail to show that the measures are feasible and will be provided.

The NPF supports the protection and promotion of natural assets and biodiversity via green infrastructure. As previously discussed, the Kerry CDP 2022-2028 includes several nature conservation policies relevant to the Proposed Development, refer to Section 9.2.2.3.

9.3.8 Assessment Assumptions and Limitations

The aim of the desk study was to help characterise the baseline context of the Proposed Development and provide valuable background information that may not be captured by field survey alone. Information obtained during the desk study is dependent upon people and organisations having made and submitted records for the area of interest. As such, a lack of records for particular species does not necessarily mean that they do not occur in the survey area. Likewise, the presence of records for particular species does not automatically mean that these still occur within the survey area or are relevant to the Proposed Development.

Details of specific limitations associated with the surveys for bats, breeding birds and wintering birds are presented in Appendices 9C, 9D and 9E EIAR Volume II, respectively. In summary, due to the time of commissioning, no wintering bird survey was completed in October. Due to the current use of the site

¹⁸ CIEEM (2019).

as an active construction site, some areas of the site were unable to be accessed during breeding bird surveys, however, these areas were observed from adjacent lands by binoculars.

All identified limitations were minor and do not substantially affect the robustness of the baseline data collected, or the assessment of ecological impacts presented in this chapter.

No specific survey was carried out for Irish hare or hedgehog, although they were noted where observed. Both species, although of conservation concern, are fairly common and very widespread. There are habitats present within the Site which could support Irish hare and hedgehog, including grassland and grassy verges, and suitable grassland, scrub and woodland habitat also exists immediately adjacent to the Site.

Wintering bird surveys were undertaken in November and December 2022 and January, February and March 2023 with the results detailed in Appendix 9E EIAR Volume II and also summarised within this chapter. No count was completed in October 2022. Additionally, data were supplied by the Irish Wetland Bird Survey (I-WeBS), a scheme coordinated by BirdWatch Ireland under contract to the National Parks and Wildlife Service of the Department of Housing, Local Government and Heritage, for the closest subsite (01465 - Tarbert Bay (Tarbert Race – Glinn)), located 2km south-west of the Site. This dataset comprised only of records from a single count in November 2018.

With similar results being recorded throughout the winter period, it is not considered that an additional count would have been significantly different. On that basis it is considered that sufficient information on the presence of wintering birds is available to undertake a reliable and robust assessment of the potential effects of the Proposed Development on these ecological features.

9.4 Baseline Environment

9.4.1 Nature Conservation Designations

9.4.1.1 Statutory Designations

There are five international nature conservation designations within the ZOI of the Proposed Development, refer to Table 9.6.

European sites are listed in ascending order of distance from the Site, with those closest described first. The locations of the statutory designated sites relative to the Proposed Development are shown on Figure 9.1. EIAR Volume III.

Table 9.6: Statutory designated nature conservation sites

Site Name [Site Code]	Approximate Distance from the Site	Summary of Qualifying Interests / Special Conservation Interests
Lower River Shannon SAC (002165)	0km – immediately adjacent	• Sandbanks which are slightly covered by sea water all the time [1110] • Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • Coastal lagoons [1150] • Large shallow inlets and bays [1160] • Reefs [1170]

Site Name [Site Code]	Approximate Distance from the Site	Summary of Qualifying Interests / Special Conservation Interests
		• Perennial vegetation of stony banks [1220] • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] • <i>Salicornia</i> and other annuals colonising mud and sand [1310] • Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330] • Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] • Water courses of plain to montane levels with the <i>Ranunculon fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260] • <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410] • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] • Freshwater pearl mussel <i>Margaritifera margaritifera</i> [1029] • Sea lamprey <i>Petromyzon marinus</i> [1095] • Brook lamprey <i>Lampetra planeri</i> [1096] • River lamprey <i>Lampetra fluviatilis</i> [1099] • Salmon <i>Salmo salar</i> [1106] • Common bottlenose dolphin <i>Tursiops truncatus</i> [1349] • Otter <i>Lutra lutra</i> [1355]
River Shannon and River Fergus Estuaries SPA (004077)	0km – immediately adjacent	• Cormorant <i>Phalacrocorax carbo</i> [A017] • Whooper swan <i>Cygnus cygnus</i> [A038] • Light-bellied brent goose <i>Branta bernicla hrota</i> [A046] • Shelduck <i>Tadorna tadorna</i> [A048] • Wigeon <i>Anas penelope</i> [A050] • Teal <i>Anas crecca</i> [A052] • Pintail <i>Anas acuta</i> [A054] • Shoveler <i>Anas clypeata</i> [A056] • Scaup <i>Aythya marila</i> [A062] • Ringed plover <i>Charadrius hiaticula</i> [A137] • Golden plover <i>Pluvialis apricaria</i> [A140] • Grey plover <i>Pluvialis squatarola</i> [A141] • Lapwing <i>Vanellus vanellus</i> [A142] • Knot <i>Calidris canutus</i> [A143] • Dunlin <i>Calidris alpina</i> [A149] • Black-tailed godwit <i>Limosa limosa</i> [A156] • Bar-tailed Godwit <i>Limosa lapponica</i> [A157] • Curlew <i>Numenius arquata</i> [A160] • Redshank <i>Tringa totanus</i> [A162] • Greenshank <i>Tringa nebularia</i> [A164] • Black-headed gull <i>Chroicocephalus ridibundus</i> [A179] • Wetland and Waterbirds [A999]
Blasket Islands SAC [002172]	89km south-west, 95km hydrological connection	• Reefs [1170] • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] • European dry heaths [4030] • Submerged or partially submerged sea caves [8330] • Harbour porpoise <i>Phocoena phocoena</i> [1351] • Grey seal <i>Halichoerus grypus</i> [1364]

Site Name [Site Code]	Approximate Distance from the Site	Summary of Qualifying Interests / Special Conservation Interests
Kilkieran Bay and Islands SAC [002111]	70km north, 117km hydrological connection	• Mudflats and sandflats not covered by seawater at low tide [1140] • Coastal lagoons [1150] • Large shallow inlets and bays [1160] • Reefs [1170] • Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330] • Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] • Machairs (* in Ireland) [21A0] • Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> [3130] • Lowland hay meadows (<i>Alopecurus pratensis</i>, <i>Sanguisorba officinalis</i>) [6510] • Otter <i>Lutra lutra</i> [1355] • Harbour seal <i>Phoca vitulina</i> [1365] • Slender naiad <i>Najas flexilis</i> [1833]
Slyne Head Islands SAC [000328]	106km north-west, 134km hydrological connection	• Reefs [1170] • Common bottlenose dolphin <i>Tursiops truncatus</i> [1349] • Grey seal <i>Halichoerus grypus</i> [1364]

9.4.1.2 Non-statutory Designations

There is only one non-statutory designation for nature conservation within 2km of the Site namely Tarbert Bay pNHA, which is located 125m to the south of the Site. Tarbert Bay pNHA site consists of a sandy intertidal bay fringed by saline vegetation, and deciduous woodland. The site is important for wintering waterfowl as it overlaps with River Shannon and River Fergus Estuaries SPA (004077).

9.4.2 Habitats

A description of the habitats within the Site is provided below in the order that they are listed in *A Guide to Habitats in Ireland*¹⁹ and are also shown in Figure 9.2, EIAR Volume III.

¹⁹ Fossitt (2000). *A Guide to Habitats in Ireland*.

FL7 Reservoir

A reservoir of approximately 0.4ha is present in the east of the Site, surrounded by grassland.

GA2 Amenity grassland

Several small areas of amenity grassland are present in the north and east of the Site, adjacent to the main road that runs through it. Dominant species are red fescue *Festuca rubra*, annual meadow-grass *Poa annua*, and Yorkshire fog *Holcus lanatus*, while broadleaved herbs including creeping cinquefoil *Potentilla reptans*, ribwort plantain *Plantago lanceolata*, dandelion *Taraxacum officinale* agg., and daisy *Bellis perennis* are also common.

GS2 Dry meadows and grassy verges

Dry meadows and grassy verges are present throughout the Site, with the largest area in the extreme east of the Site surrounding the service reservoir. Smaller areas are spread across the Site, with larger areas in the north of the Site, and at the southern limit of the Site. Species composition is largely similar across all grassland plots, and the dominant species are cock's-foot *Dactylis glomerata*, Yorkshire fog, and creeping bent *Agrostis capillaris*. A range of other grasses and forbs are also present, including red fescue, false oat-grass *Arrhenatherum elatius*, sweet vernal grass *Anthoxanthum odoratum*, curly dock *Rumex crispus*, broad-leaved dock *Rumex obtusifolius*, bush vetch *Vicia sepium*, knapweed *Centaurea nigra*, ribwort plantain, meadow vetchling *Lathyrus pratensis*, red clover *Trifolium pratense*, white clover *Trifolium repens*, greater plantain *Plantago major*, and creeping buttercup *Ranunculus repens*.

ED2 Spoil and bare ground

A large area of bare gravel is present in the centre of the Site, in the area where the OCGT building and other ancillary buildings will be built. To the south of this is a portion of the 240V electrical substation which is also covered by bare gravel. The four large fuel tanks in the west of the Site are surrounded by bare gravel, although in places this is beginning to become vegetated and therefore forms a mosaic with recolonising bare ground. A gravel road runs parallel to the coast at the north of the Site.

ED3 Recolonising bare ground

Strips of recolonising bare ground are present immediately adjacent to the gravel road in the north of the Site. Species present include catsear *Hypochaeris radicata*, dandelion, mouse ear hawkweed *Pilosella officinarum*, red and white clover, ribwort plantain, sedges *Carex* sp., bird's foot trefoil *Lotus corniculatus*, creeping buttercup, sea mayweed *Tripleurospermum maritimum*, and silverweed *Argentina anserina*.

BL3 Buildings and artificial surfaces

Buildings and the tarmacked roads throughout the Site make up the majority of the Site. The existing Tarbert HFO Power Station is the largest building on site, followed by the combined area of the four large fuel oil tanks. Other associated buildings, including the pumphouse, storage buildings, and temporary construction portacabins make up the remaining area.

WS1 Scrub

The majority of scrub within the Site is present in the area surrounding the fuel oil tanks and is dominated by bramble *Rubus fruticosus* agg, with willow *Salix* sp. also common. Other species including Yorkshire fog, cock's-foot, meadow vetchling, ribwort plantain, and field horsetail *Equisetum arvense* are also present in this area. A narrow margin of scrub at the eastern boundary of the Site comprises willow,

gorse *Ulex europaeus* and bramble. Another narrow strip of scrub is present between the two substation areas and is composed largely of bramble and willow, with some mature trees also present, including spruce *Picea* sp., pine *Pinus* sp., willow, sycamore *Acer pseudoplatanus* and young oak *Quercus* sp.

WS3 Ornamental/non-native shrub

Two small plantings of ornamental shrubs are present to the east of the existing Tarbert HFO Power Station building. Species present include *Fuschia*, *Escallonia*, barberry *Berberis* sp., New Zealand holly *Olearia macrodonta*, willow leaf hebe *Hebe salicifolia*, and bramble.

WL2 Treelines

A single treeline is present in the south of the Site beyond the service reservoir, consisting of pine and spruce, ash *Fraxinus excelsior*, hawthorn *Crataegus monogyna* and bramble. A second treeline is present along the border of the amenity grassland to the north of the service reservoir and is composed mainly of sycamore.

LR2 – Moderately exposed rocky shores

A small area of exposed rocks is present along the northern boundary.

LS5 – Mixed sediment shores

A narrow strip of sandy and muddy shoreline is present within the Site boundary at the north of the Site.

MW2 Sea inlets and bays

A concrete channel in the south of the Site connects to the inlet of the Shannon Estuary beyond the southern boundary and permanently contains tidal seawater.

9.4.3 Protected and Notable Species

The baseline conditions with respect to protected and notable flora and fauna species are provided under the following sub-headings. Where relevant, records of the species identified by the desk study are referred to under the species sub-headings.

9.4.3.1 Flora

The NBDC database search returned four records of rare plant species within 2km of the Site, listed in Table 9.7. No protected plant species were identified during the field survey. Bee orchid *Ophrys apifera* was recorded immediately to the west of the Site, within the adjacent TEG site, and although this species is not included within the FPO, it is considered to be of County level importance.

Table 9.7: Records of rare plant species from the NBDC Dataset.

Species	Record Count	Date of Last record	Designation
Pale flax <i>Linum bienne</i>	1	31/12/1999	Threatened Species: Near threatened
Shepherd's-needle <i>Scandix pecten-veneris</i>	1	31/12/1929	Threatened Species: Regionally Extinct
Potato bryum <i>Bryum bornholmense</i>	3	02/03/2009	Threatened Species: Near threatened
Slender pocket-moss <i>Fissidens exilis</i>	3	31/12/1966	Threatened Species: Vulnerable

9.4.3.2 Bats

A review of the NBDC database did not return any records of bat species within 2 km of the Site.

All buildings to be removed were assessed as having Negligible suitability for roosting bats, and therefore it is considered that roosting bats will not be impacted by the Proposed Development.

Three walked transect surveys carried out between June and August 2023, inclusive, recorded low levels of bat activity, limited to three species of bat: common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and Leisler's bat *Nyctalus leisleri*. The locations of all recordings of bats during the walked activity transects are shown on Appendix 9C EIAR Volume II - Figure 9C.1, 9C.2 and 9C.3. As can be seen from the following summary, activity was generally restricted to a limited number of locations within the SSE Tarbert site:

- Leisler's bats were noted flying high across the Site, particularly in front of the existing Tarbert HFO Power Station building.
- Soprano pipistrelles were noted often foraging around the trees behind the security building at the entrance to the SSE Tarbert site, along the tree line at the outflow stream, along the road towards the NORA tank farm and other scattered locations throughout the Site.
- Common pipistrelles were recorded along the road towards the NORA tank farm and other scattered locations throughout the Site.

9.4.3.3 Otter

The NBDC returned one record of otter within 2km of the Site. The NBDC also returned eight records of otter within the 10km grid square (R04), within which the Proposed Development lies, and the records include spraint observations, and a live sighting of three individuals approximately 6km to the south-west, from 2015.

Anecdotal evidence from the power station staff reveal otter was once a common sight, particularly at the intake area of the Site (north-east side) where otter would feed from the crustaceans filtered out of the seawater and caught in the screening areas. However, otter are now rarely seen, if at all, since the Tarbert HFO Power Station has ceased production. An otter survey was undertaken on 7 June 2023 and 30 August 2023 of the Site and surrounding coastal habitat. No confirmed evidence of otter was found during the field survey, and no otter holts or resting sites were identified. Mammal push-unders and trails were noted in the general area of the intake area which could be attributed to otter. A potential sprainting site was also noted along the shoreline but the spraint was too old to be confirmed as otter. Otter are assumed to be present in the area, based on the precautionary principle and due to the presence of suitable otter habitat.

9.4.3.4 Badger

The NBDC returned three records of badger within 2km of the Site, and 19 badger records within the 10km grid square (R04), within which the Site lies, most of which are records of roadkill or badger setts. The latter records are all from the last 20 years, with the closest record also being the most recent (from 2018).

A badger survey was undertaken on 7 and 8 June and 30 August 2023 whereby all areas within the Site and immediate surroundings were checked for evidence of badger. A number of trails, likely attributable to badger were noted around the wider power station site with a badger snuffle hole found in the trees behind the security building at the Site at the power station entrance. Badger dung was confirmed beside the reservoir; however, no confirmed badger setts were found. Anecdotal evidence from power station staff suggest badgers are infrequently seen and live off site, entering and leaving by the front gate, and are therefore assumed to occasionally visit the Site.

9.4.3.5 Other Small Mammals

The NBDC database search returned only one record of hedgehog within 2km of the Site, from 2015. No hedgehogs were recorded incidentally during the course of ecological field survey in 2023, however Irish hare was observed on all field survey visits, either individually or in small groups, with five individuals observed on one occasion. Suitable habitat for hedgehog is limited on Site, whereas woodland and scrub to the south of the Site provides more ideal habitat. Given the presence of suitable habitat on Site, it is assumed hedgehog may be present on Site.

9.4.3.6 Reptiles

There were no protected and notable reptile records returned by the NBDC database within 2km of the Site. Common lizard was not observed during field surveys, and there is limited suitable habitat for this species within the Site, and this species is assumed to be absent from the Site.

9.4.3.7 Breeding Birds

Records of 134 bird species were returned by the NBDC database search within 2km of the Site, of which 37 species are protected under Annex I, II or III of the Birds Directive. Six species are on the Red list of birds of conservation concern in Ireland, and 35 species appear on the Amber list, see Appendix 9D EIAR Volume II. Many of these bird records are identified at the 10km grid reference resolution, within which the Site occupies a small extent. Therefore, it cannot be confirmed if these birds were recorded within the Site itself, or in the more extensive area outside the Site within the same or adjacent 10km square. Furthermore, many of these birds are not breeding birds, and are likely to be winter visitors.

A total of 33 species were recorded during the breeding bird surveys carried out in 2023. Of those, eleven species are Amber-listed birds of conservation concern, and two are Red-listed species, see Appendix 9D EIAR Volume II. Many of the birds recorded during the surveys were observed singing and carrying food, and recent fledglings were also noted, demonstrating that birds are likely to be using the Site to breed. An occupied swallow *Hirundo rustica* nest was observed in the south of the Site, and a single ringed plover nest was identified with four eggs in the west of the Site. Between the first and second surveys, the four eggs disappeared likely due to predation and the ringed plover pair had established a new nest with four eggs, approximately 100 m to the east of the original nest site. Except for these nests, no other nests were identified, however, numerous birds were observed entering and exiting scrub in the west of the Site, and it is highly likely that birds use this area for nesting.

The breeding bird assemblage comprises species typical of urban, grassland and coastal landscapes. Although several species of conservation concern were observed, they are widespread and common

in Ireland. The results of the breeding bird surveys are shown on Figures 9D.1 and 9D.2 of Appendix 9D EIAR Vol II.

9.4.3.8 Wintering Waterbirds

Non-breeding bird surveys of waterbirds were carried out twice per month from November 2022 to March 2023, inclusive, within the Site plus an approximate 500 m buffer (hereafter referred to as the 'survey area'). A total of 22 species were recorded during the non-breeding bird surveys, of which nine species are qualifying species of River Shannon and River Fergus Estuaries SPA. Black-headed gull was the most abundant species and was present on seven of the eight surveys. Other than black-headed gull, the only species for which a peak count of more than 20 birds was recorded were:

- cormorant.
- common gull.
- dunlin.
- snipe.
- teal; and
- wigeon.

Habitats for non-breeding birds are limited within the Site, and most waterbirds were recorded outside of the Site, within the Tarbert Island bay, and Tarbert Bay to the south of the Site.

The results of the non-breeding bird surveys are shown on Figures 9E.1 – 9E.10 of Appendix 9E EIAR Vol II.

9.4.3.9 White-tailed Eagle

Following a successful initial reintroduction programme from 2007-2011, the National Parks and Wildlife Service (NPWS) began a second phase of the white-tailed eagle reintroduction project to bolster the existing eagle population in Ireland. The eagle currently has a small breeding population spread across Counties Cork, Kerry, Clare, Galway and Tipperary. The latest reintroduction programme began in 2020 and released young eagles at a small number of sites, one of which was in the Lower Shannon estuary area. This release site has relevance for the Proposed Development. Whilst they are released at the end of the breeding season in August, the young eagles often remain close to the area they were released into before usually dispersing further across Ireland and sometimes even beyond (NPWS, pers. comm).

During the breeding and wintering bird surveys and all other visits to the Site, no white-tailed eagles were observed. No suitable nesting sites occur within the Site and although there is a small woodland copse situated between the SSE Tarbert site entrance and the ferry terminal, it is not considered a suitable nesting site given the constant high level of human activity in the area. Similarly, there is a substantial deciduous woodland block several hundred metres to the south of the Site, although it would be considered sub-optimal nesting habitat given its proximity to the busy ferry terminal (NPWS, pers. comm).

9.4.3.10 Invertebrates

Records of five notable species were returned by the NBDC database search within 2km of the Site, see Table 9.8.

Table 9.8: Records of notable invertebrate species from the NBDC dataset.

Species	Record Count	Date of Last record	Designation
Large red-tailed bumblebee <i>Bombus (Melanobombus) lapidaries</i>	1	21/04/2018	Threatened Species: Near threatened ²⁰
Dark green fritillary <i>Argynnis aglaja</i>	1	31/12/1984	Threatened Species: Vulnerable ²¹
Large heath <i>Coenonympha tullia</i>	3	31/12/1977	Threatened Species: Vulnerable ²¹
Marsh fritillary <i>Euphydryas aurinia</i>	6	31/12/1990	Threatened Species: Vulnerable ²¹ ; Annex II
Wall brown <i>Lasiommata megera</i>	1	31/12/1984	Threatened Species: Endangered ²¹

No notable invertebrates were recorded on Site.

9.4.3.11 Invasive Non-native Species

Flora

The NBDC database search returned several records of invasive plant species within 2km of the Site, see Table 9.9.

Table 9.9: Records of invasive plant species from the NBDC dataset.

Species	Record Count	Date of Last record	Designation
Common cord-grass <i>Spartina anglica</i>	2	05/05/2018	High Impact Invasive Species ²² ; Regulation S.I. 477 (Ireland)
Giant-rhubarb <i>Gunnera tinctoria</i>	2	16/09/2008	High Impact Invasive Species; Regulation S.I. 477 (Ireland)
Hairy rocket <i>Erucastrum gallicum</i>	1	31/12/1999	Medium Impact Invasive Species
Japanese knotweed <i>Reynoutria japonica</i>	1	23/04/2017	High Impact Invasive Species; Regulation S.I. 477 (Ireland)
Rhododendron <i>Rhododendron ponticum</i>	1	15/08/2007	High Impact Invasive Species; Regulation S.I. 477 (Ireland)
Spanish bluebell <i>Hyacinthoides hispanica</i>	2	21/04/2018	Regulation S.I. 477 (Ireland)
Sycamore <i>Acer pseudoplatanus</i>	11	30/07/2022	Medium Impact Invasive Species
Three-cornered garlic <i>Allium triquetrum</i>	2	07/04/2018	Medium Impact Invasive Species Regulation S.I. 477 (Ireland)

During field survey, sea buckthorn *Hippophae rhamnoides*, a medium impact scheduled invasive plant species was recorded in the west of the Site. Furthermore, winter heliotrope (low impact), was also recorded scattered within the Site as well as to the west of it.

Fauna

²⁰ FitzPatrick et al. (2006) *Regional Red List of Irish Bees*.

²¹ Regan et al. (2010). *Ireland Red List No. 4 – Butterflies*

²² O'Flynn, C., Kelly, J. and Lysaght, L. (2014). Ireland's invasive and non-native species – trends in introductions. National Biodiversity Data Centre Series No. 2. Ireland

Records of eight invasive animal species within 2km of the Site were provided from the NBDC, see Table 9.10.

Table 9.10: Records of invasive animal species from the NBDC dataset.

Species	Record Count	Date of Last record	Designation
Budapest slug <i>Tandonia budapestensis</i>	1	20/09/1977	Medium Impact Invasive Species
Common garden snail <i>Cornu aspersum</i>	2	20/09/1977	Medium Impact Invasive Species
Jenkins' spire snail <i>Potamopyrgus antipodarum</i>	6	10/08/2017	Medium Impact Invasive Species
Keeled slug <i>Tandonia sowerbyi</i>	1	20/09/1977	Medium Impact Invasive Species
Portuguese oyster <i>Crassostrea gigas</i>	1	27/07/2009	High Impact Invasive Species
Ruddy duck <i>Oxyura jamaicensis</i>	1	09/10/1981	High Impact Invasive Species; Regulation S.I. 477 (Ireland)
Fallow deer <i>Dama dama</i>	2	31/12/2008	High Impact Invasive Species; Regulation S.I. 477 (Ireland)
Sika deer <i>Cervus nippon</i>	1	31/12/2008	High Impact Invasive Species; Regulation S.I. 477 (Ireland)

No invasive non-native faunal species were observed during the field survey.

9.4.3.12 Marine mammals

The Lower Shannon River SAC is designated for its common bottlenose dolphins. During the wintering bird survey on the 15 February 2023 at high tide, two bottlenose dolphins were observed swimming and breaking water beside the existing oil supply jetty associated with the Tarbert HFO Power Station and NORA facility. No other marine mammals were noted in the surrounding coastal area, despite numerous visits to the Site.

9.4.4 Future Baseline

The construction phase of the Proposed Development will be approximately 29 months and is due to commence in late Q2 2024 (subject to receipt of planning permission). Therefore, the baseline for most of the Site at the time of construction is expected to be similar to that described in the baseline.

Construction of the TEG plant in the western part of the SSE Tarbert site, will significantly change the baseline ecological conditions of this area, through removal of grassland and scrub, which will change the distribution of some species (e.g., nesting birds). However, following decommissioning of the TEG site, lands will revert to bare ground as previous. Aside from this, there are no other known or likely land use changes, or changes to the terrestrial, coastal or marine environment within the Zol of the Proposed Development, that have the potential to significantly change the baseline ecological conditions at the time of construction of the Proposed Development.

Potentially relevant protected species (e.g., badger) could establish new locations used for shelter or protection, and it will be necessary to ensure compliance with the legislation protecting these species.

With the exception of changes to the TEG site, it is therefore expected that the current baseline conditions will remain largely unchanged by the time of construction of the Proposed Development.

9.4.5 Baseline in the Absence of the Proposed Development

The future baseline in the absence of the Proposed Development (the 'do nothing scenario'), taken for these purposes to be the situation 25 years from the time of commissioning, would likely be very similar to the current baseline. Whilst the future of the existing Tarbert HFO Power Station buildings remain uncertain given their redundancy, however, it is likely that they will be decommissioned and removed from the Site. Any infrastructure such as buildings, roads, and paths and existing vegetation remaining on Site will be maintained. Other parts of the Site will return to hardstanding. Habitats and species assemblage found to be present in the current baseline conditions will remain largely unchanged.

9.5 Potential Impacts

9.5.1 Features Excluded from Further Assessment

Relevant ecological features are those that are considered to be 'important' and have the potential to be affected by the Proposed Development²³. In view of the baseline data obtained through a desk study and field survey, the following features have been excluded from further assessment because there is considered to be no possible effect on them, through absence of the feature, clear absence of an impact pathway, or because they are of limited ecological value:

- **protected or notable native plants** - there are no known protected or notable native plant species within the Site. As previously stated, bee orchid was identified to the west of the Site but not within the Site boundary.
- **habitats – Reservoir, Amenity grassland, Spoil and bare ground, Buildings and artificial surfaces, Ornamental/non-native shrub, and Sea inlets and bays** - these habitats within the Site will either not be impacted by the Proposed Development or are of limited ecological value.
- **Mixed substrate shores, mixed sediment shores** - the construction / operation / decommissioning of the Proposed Development will have no impact on this habitat as no works will be carried out within it, and no changes from the current outfall system in place will be necessary.
- **amphibians** - there are no freshwater ponds or streams on Site, and the service reservoir is unlikely to support amphibians, as it is relatively large and deep and lacks suitable vegetation. Even if amphibians are present in the reservoir, they are likely to occur in very low numbers and will be unimpacted by the Proposed Development.
- **invertebrates** - the Site is of limited importance for notable butterflies and bees due to the buildings / hardstanding across most of the Site limiting the occurrence of flowers.

²³ CIEEM (2019). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.*

- **invasive non-native animal species** - invasive animal species recorded within 2 km of the Site include ruddy duck, fallow deer, sika deer, Portuguese oyster and four species of slug and snail. These species were not observed on site, and there is no mechanism by which the Proposed Development could cause a significant increase in these species and more importantly no realistic means by which the Proposed Development could spread them elsewhere.

Moreover, and as described above, there will be no construction on the shore or within the intertidal zone or marine environment. In addition, the Proposed Development will result in no material change to abstraction or discharge rates or other parameters that could impact on ecological features. There is therefore no possibility of impacts as a result of changes to coastal processes or operational discharges to the marine environment, which are therefore not considered for any ecological feature.

9.5.2 Importance of Ecological Features

Ecological features identified in the baseline conditions and not scoped out of detailed assessment (see Section 9.5.1), i.e., those that are considered 'important' (following CIEEM guidelines²⁴), are set out in Table 9.11, together with the rationale. Ecological importance has been assessed on a geographic scale following CIEEM guidelines²⁵.

For the purposes of defining geographical scale in this EIA, 'County' is defined as Co. Kerry, 'Local' as the area within 5km of the Proposed Development, and 'Site' as the Site and immediate surroundings.

Table 9.11: Importance of ecological features

Ecological Feature [Site Code]	Importance	Rationale
Lower River Shannon SAC (002165)	International	International nature conservation designation.
River Shannon and River Fergus Estuaries SPA (004077)	International	International nature conservation designation.
Blasket Islands SAC [002172]	International	International nature conservation designation.
Kilkieran Bay and Islands SAC [002111]	International	International nature conservation designation.
Slyne Head Islands SAC [000328]	International	International nature conservation designation.
Tarbert Bay pNHA	National	National nature conservation designation.
Habitats – Recolonising bare ground	Site	This habitat may support a variety of flora and fauna species. Given the limited quality and small extent of this habitat, is it assigned Site significance only.
Habitats – Dry meadows and grassy verges	Site	This semi-natural habitat is abundant and widespread across the Site and may support a variety of flora and fauna species, including invertebrates, small mammals, and breeding birds. Given the quality of this habitat, is it assigned Site significance only.

²⁴ CIEEM (2019). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.*

²⁵ CIEEM (2019).

Ecological Feature [Site Code]	Importance	Rationale
Habitats – Treelines	Site	This semi-natural habitat may support a variety of fauna species including breeding birds. Given the small extent and limited quality of this habitat, it is assigned Site significance only.
Habitats – Scrub	Site	This semi-natural habitat is widespread across the Site and may support a variety of flora and fauna species including breeding birds. Given the quality of this habitat, it is assigned Site significance only.
Bats	Site	There is limited foraging / commuting bat activity across the Site, mostly at the south of the Site. The species that predominately use the Site are common pipistrelle, soprano pipistrelle and Leisler's bat, which are all relatively common and widespread in Ireland. The habitat within the Site is considered to be of Site importance as it provides limited foraging and commuting resource to bats in the local area, but is not sufficiently good quality to be valuable in a Local or County context.
Badger	Site	No evidence of badger setts was identified on Site. Badgers have been anecdotally using the woodland to the east of the Site and a snuffle hole and dung was recorded nearby the Site. Given the low usage of the Site and immediate surrounds by badger, including a lack of active resting sites, this species has been assigned Site importance only.
Otter	Local	Otters are legally protected in Ireland under the Habitat Regulations which transpose the Habitats Directive. Otters are likely present around Tarbert Island at least occasionally, however, no resting places were identified within the Site. As the Site appears to be used infrequently for foraging only, Local importance has been assigned.
Other protected mammals – red squirrel, hedgehog, Irish hare	Local	These species are protected under the Wildlife Acts. Hedgehog was not recorded during field survey, but could occur within the Site (records of hedgehog exist within 2km of the Site). Irish hare was recorded during field survey. This species is common and widespread, and the population within the Site is of Local importance.
Breeding birds	Local	Swallow were observed nesting in the Site, and ringed plover were nesting outside of the Site, but within the adjacent TEG Site. Several other species are considered to have bred within the Site, including meadow pipit, blackbird, twite and stonechat. Due to the presence of ringed plover, an SCI of the SPA, and nesting Red-Listed and Amber-Listed birds, the Site is considered to be of Local importance.
Wintering birds	County	Several SCI species of River Shannon and River Fergus Estuaries SPA were recorded adjacent to the Site, however no part of the Site itself was found to be used by large aggregations of waterbirds. The highest peak count for Dunlin, one of the SCI species, in the bay to the south of the Site was 250, which represents only 0.017% of the five year mean peak count. Therefore, although several SCI species of River Shannon and River Fergus Estuaries SPA have been recorded in the vicinity of the Site, given the low value of the terrestrial habitats within the Site and relatively small numbers of birds, wintering waterbirds have been assigned County importance, rather than anything greater which could have been applied given their association with the European site.
White-tailed eagle	National	Although no white-tailed eagles have been noted on site and no suitable habitat exists on it for them, it is known that a release site is located somewhere in the lower Shannon Estuary as part of the national white-tailed eagle reintroduction project. The eagles are on Annex I of the Birds Directive and are Red-listed in Ireland with only around 10 pairs of a breeding population. Any impacts to the species could result in significant effects at a national level.
Common lizard	Site	Common lizard is protected under the Wildlife Acts. It was not recorded during field survey, but could occur in habitats such as dry meadows and grassy verges and scrub within the Site and the surrounding

Ecological Feature [Site Code]	Importance	Rationale
		environment. No records of common lizard were returned from the desk study records. Any population of common lizard present is likely to small and insufficient to be valued as even of Local importance.
Invasive non-native plant species - sea buckthorn, winter heliotrope.	Negligible	These species are not important through ecological value but for their negative effects on biodiversity. The main risk is the potential for the spread of non-native species during construction. Sea buckthorn is medium impact scheduled invasive species These non-native invasive species can impact the local populations of native species.
Marine mammals	National	Bottlenose dolphins occur throughout the Shannon estuary just beyond the site. They are a qualified interest species of the Lower River Shannon SAC within which the area around Tarbert Island is regarded as a hotspot for them. On that basis, they are valued at National importance.

9.5.3 Potential Impacts of the Proposed Development

The following broad categories of impact could arise during the construction, operation and / or decommissioning of the Proposed Development and are considered, where potentially relevant, in relation to each of the ecological features scoped in to detailed assessment above:

- permanent and / or temporary loss or degradation of habitats during construction, and potentially decommissioning also;
- airborne pollution as a result of emissions during construction, operation and / or decommissioning of the Proposed Development;
- disturbance of animal species during the construction, operation and / or decommissioning due to increased noise, vibration, lighting, or the presence of personnel, plant and / or machinery;
- damage or destruction of the resting places of protected or notable animal species during construction and decommissioning of the Proposed Development;
- displacement of animal species during all phases of the Proposed Development;
- injury or mortality of plant or animal species during construction and decommissioning; and
- the spread of invasive non-native plant species during construction and decommissioning.

In accordance with guidance published by the Institute of Air Quality Management (IAQM)²⁶, the air quality study area for construction dust caused by plant and machinery was adopted as being the Site plus a 350m buffer, or a 50m buffer around the construction traffic route, extended to 500m from the Site entrance (Section 7.3.1.1), refer to Chapter 7 (Air Quality). The only sensitive ecological feature (*i.e.*, nature conservation designations or plant species) within the 50-500m screening distances for assessment of air quality impacts is River Shannon and River Fergus Estuaries SPA. However, River Shannon and River Fergus Estuaries SPA is not susceptible to dust due to the mobile qualifying bird interests, therefore, there is no further consideration of construction phase air quality changes within this chapter.

²⁶ Holman *et al.*, (2014). *A guide to the assessment of air quality impacts on designated nature conservation sites.*

There are no likely new pathways for waterborne pollution of habitats or species given industry-standard good practice mitigation measures will be implemented at all stages of the Proposed Development to meet legal and regulatory requirements (EIAR Chapter 12 Volume I). Whilst emissions to water are proposed, they will use existing outfalls and no increase in discharges are anticipated. This discharge will be regulated by a new IE Licence or by amendment of the existing IE Licence P0607-02, following a review. Due to the small volumes of uncontaminated water there will be no impacts on wetlands habitats or estuarine waters.

9.5.4 Impacts on Nature Conservation Designations

9.5.4.1 Construction Phase

A detailed assessment of the potential impacts (as per above) and effects of the Proposed Development on the relevant European sites of international nature conservation importance is provided in the AA Screening/NIS.

Tarbert Bay pNHA is largely encompassed within River Shannon and River Fergus Estuaries SPA (which is considered in the AA Screening Report/NIS), and is also designated for habitats suitable for wintering birds which is also an SCI of the aforementioned SPA. Therefore, impacts and effects on this pNHA will be identical to those reported for the SPA.

All the potential impacts of the Proposed Development are considered in the NIS. It is concluded that there will be no adverse effect on the integrity of any European sites as a result of the construction of the Proposed Development, alone or in-combination with any other plan or project. By inference, therefore, there will also be no adverse effect on the relevant pNHA site.

A conclusion of no adverse effects on site integrity can be drawn even where minor negative impacts are predicted, so long as these do not prevent the relevant conservation objectives of a given site from being met. Therefore, adopting EIA terminology, while there may be slight negative impacts on European sites from the construction of the Proposed Development, these will not be significant and will result in, at worst, **Negligible effects**.

9.5.4.2 Operational Phase

As stated above, full assessment of the potential impacts and effects of the operation of the Proposed Development on European sites can be found in the NIS. The potential for significant effects to arise on any SAC or SPA (and by association with designated SPA, Tarbert Bay pNHA) due to airborne pollution during operation was assessed in detail. This was based on air quality modelling carried out for the Proposed Development which is described in more detail in Chapter 7 (Air Quality). All other factors were also assessed based on the results presented in the other chapters of this EIAR. (E.g., Chapter 11 Noise and Vibrations).

It was concluded that there will be no adverse effect on the integrity of any of the relevant European sites because of the operation of the Proposed Development, so by inference there will be no adverse effect on Tarbert Bay pNHA site. For the purposes of EIA, and as set out above, there will be, at worst, **Negligible effects** sites designated for nature conservation during the operational phase.

9.5.4.3 Decommissioning Phase

The impacts which could arise during the decommissioning phase are likely to be consistent with those of the construction phase. For the purposes of EIA, and as set out above, it is therefore concluded that there will be, at worst, **Negligible** effects on sites designated for nature conservation during the decommissioning phase.

9.5.5 Impacts on Recolonising bare ground

9.5.5.1 Construction phase

Habitat Loss

There will be minor loss of this habitat to facilitate the construction of the Proposed Development. The recolonising bare ground on Site is of relatively low quality and therefore of limited ecological value and any loss of this habitat type will be of **Site** significance.

9.5.5.2 Operational phase

There is no expectation of negative effects on recolonising bare ground during the operational phase. As the Proposed Development will be primarily controlled remotely, there is a likelihood that existing bare ground is colonised leading to a greater coverage or recolonising bare ground.

9.5.5.3 Decommissioning Phase

Areas of existing bare gravel may develop into recolonising bare ground if left undisturbed, therefore there may be loss of minor areas of this habitat during the decommissioning phase. However, the scale of the impacts are likely to be consistent with those of the construction phase, and thus effects are likely to be of **Site** significance only.

9.5.6 Impacts on Dry meadows and grassy verges

9.5.6.1 Construction Phase

Habitat loss

The majority of the grassland on Site will remain unimpacted by the Proposed Development, however, there may be minor loss of small areas of grassy verges to facilitate construction. The grassland within the Site is species-poor and of limited ecological value. Loss of small areas of grassland will consequently be of **Site** significance during the construction phase.

9.5.6.2 Operational Phase

There is no expectation of effects on dry meadows and grassy verges during the operational phase.

9.5.6.3 Decommissioning Phase

The impacts which could arise during the decommissioning phase are likely to be consistent with those of the construction phase. For the purposes of EIA, and as set out above, it is therefore concluded that effects during the decommissioning phase will be of **Site** significance.

9.5.7 Impacts on Treelines

There will no loss of treelines to facilitate the Proposed Development, and there will be no impacts on trees arising from either the construction, operation or decommissioning phases.

9.5.8 Impacts on Scrub

There will no loss of scrub to facilitate the Proposed Development, and there will be no impacts on scrub arising from either the construction or operation phase. It is unlikely that any areas to be impacted by the development will succeed to scrub, and thus no impacts on scrub are likely during the decommissioning phase.

9.5.9 Impacts on Sea inlets and bays

9.5.9.1 Construction Phase

Waterborne Pollution

There will be no works that could impact on Tarbert Island Bay outside of the Site boundary or the concrete channel within the Site boundary containing tidal seawater because of the pollution prevention measures outlined in Section 9.6. Therefore, no pollution effects are possible as a result of the Proposed Development. There will consequently be **No effect** on this habitat during the construction phase.

9.5.9.2 Operational Phase

Waterborne Pollution

The Proposed Development does not have a water requirement for cooling so there will be no abstraction from sea water or groundwater for process or cooling requirements. There will be some discharges to the estuary from the demineralisation process however, these will essentially be uncontaminated mains water with naturally occurring minerals removed from the mains water prior to use. Wastewater will be treated to adjust the pH to neutral range before discharge to an existing discharge point. There is likely to be an infrequent requirement for wash down of GT's prior to outages using mains water, and small volumes of waste water will be collected in a container for removal to a licenced waste facility. For the purposes of EIA, and as set out above, it is therefore concluded that there will be, at worst, **Negligible** effects during the operational phase.

9.5.9.3 Decommissioning Phase

The impacts which could arise during the decommissioning phase are likely to be consistent with those of the construction phase. For the purposes of EIA, and as set out above, it is therefore concluded that there will be **Negligible** effect during the decommissioning phase.

9.5.10 Impacts on Bee Orchid

9.5.10.1 Construction Phase

The habitats where bee orchid was recorded were to the west of the Site, and a translocation of bee orchids was carried out prior to removal of habitats during construction for another project. The orchids were translocated to areas outside the boundaries of both projects. No other bee orchids were identified on site, and therefore the Proposed Development will have **No effect** on bee orchid.

9.5.10.2 Operational Phase

There are no impacts that could have a significant effect on translocated bee orchids during the operational phase. **No effect** is therefore predicted on this species.

9.5.10.3 Decommissioning Phase

There are no impacts that could have a significant effect on bee orchids during the decommissioning phase. **No effect** is therefore predicted on this species.

9.5.11 Impacts on Bats

9.5.11.1 Construction Phase

Habitat Loss

Bat activity within and surrounding the Site, was found to be low to moderate, at most, and was dominated by common pipistrelle, soprano pipistrelle and Leisler's bat. The results of the activity surveys found that foraging and commuting behaviour was observed scattered throughout the Site, but in relatively low levels. Bats showed a preference for areas of the SSE Tarbert site covered by a mosaic of scrub and dry meadows and grassy verges, and scrub, again to the south of the Site. Despite being well lit, light-tolerant pipistrelles were recorded along the main access road and site parking areas in the northeast of the Site, including in the main laydown area while Leisler's bats flew high overhead, not confined or restricted to habitats below.

The centre of the Site currently supports hardstanding and bare ground, and thus there will be no loss of natural habitats used by bats within this area to facilitate the construction of the Proposed Development. Furthermore, this area does not connect to high quality foraging habitat elsewhere in the surrounding area, so is unlikely to be an important commuting route for bats. This is supported by the results of the walked bat activity transects which did not identify any evidence of large numbers of bats, including in this location.

Given that the area in which the OCGT is to be built is hardstanding and bare ground which are of negligible suitability for commuting and foraging bats, there will be no loss of suitable habitat for bats, and the Proposed Development will have a **Negligible effect** on foraging / commuting bats.

Disturbance and Displacement

Artificial lighting used during the construction phase will be concentrated around the centre and north of the Site. This area does not appear to be an important commuting route as demonstrated by the low activity in this area. Therefore, disturbance here is unlikely to displace bats. Furthermore, during spring to autumn when bats are active, construction hours will largely coincide with daylight hours when bats are in their roosts. However, there may be limited periods towards the start and end of the season when bats are active during construction hours, or at other times when some construction activities that cannot be stopped are in progress and lighting is present. Given the baseline conditions, the low levels of bat activity recorded and the limited potential for lighting to coincide with periods of bat activity, it is very unlikely that construction lighting will have substantial impacts on bats. It is therefore concluded that there will be **Negligible** effects on bat activity.

Damage or Destruction of Roosts

No trees or structures were identified as having bat roost suitability. Therefore, there is consequently no realistic possibility of a loss of roost sites from the construction of the Proposed Development and **No effect** predicted.

Injury and Mortality

As there are no roost sites which could be lost to the Proposed Development, there is no realistic mechanism by which construction works could injure or kill a bat. **No effect** on bats is therefore expected from this theoretical impact.

9.5.11.2 Operational Phase

Disturbance

The construction laydown areas to the east of the Proposed Development are required during the construction phase only and will be removed and reinstated prior to the operational phase of the Proposed Development. No roost locations were identified during field surveys, thus all permanent infrastructure associated with the Proposed Development will be beyond the distance at which any disturbance can be expected to occur.

No effects are expected from disturbance of bats during the operational phase.

Displacement

Existing lighting around the Site is operational throughout the night. Permanent lighting will be required for the Proposed Development (refer to Appendix 5B, EIAR Volume II), and this will slightly extend the area over which artificial illumination affects area used by bats. However, this is not expected to have a significant impact on bats as field survey showed that low level activity occurs in the centre of the Site despite existing illumination. Moreover, common pipistrelle and soprano pipistrelle, which were the most frequently recorded species within the ZoI of the Proposed Development, are relatively light-tolerant species, and will actively forage around lighting units²⁷.

Similarly, bat foraging around the existing Tarbert HFO Power Station was recorded, suggesting that light and noise produced by the facility was not preventing bats from using this area.

It is therefore concluded that there will be, at worst, **Negligible** effects on bats during the operational phase.

9.5.11.3 Decommissioning Phase

The impacts which could arise during the decommissioning phase of the Proposed Development are likely to be consistent with those described for the construction phase. There will be no loss of any habitat required to enable decommissioning, and a **Negligible effect** on bats is expected.

9.5.12 Impacts on Badger

9.5.12.1 Construction Phase

Habitat Loss

There will be no loss of suitable habitat for badger to facilitate the Proposed Development, and therefore **No effect** on badger.

Disturbance

As previously discussed, no evidence of badger was recorded during the field surveys. Therefore, there will be no potential for disturbance impacts to badger setts during construction. Any badgers visiting the Site are already predisposed to noise (e.g., from the neighbouring road and the existing Tarbert HFO

²⁷ Bat Conservation Trust and Institution of Lighting Professionals (2018).

Power Station). Construction will be confined to the Site, and construction of the electrical / fuel cable routes will be undertaken quickly given the nature of the works.

Negligible effects from construction-related disturbance are therefore predicted.

Displacement

Badger will continue to be able to move through the Site, to the extent currently afforded by existing routes. While there may be some physical barriers to ensure safety, badgers will continue to be able to access the Site through established gaps in perimeter fencing.

Negligible effects from construction-related displacement are therefore predicted.

Injury or Mortality

There will be a substantial increase in the volumes of vehicular traffic relative to current levels during the construction phase of the Proposed Development. There is therefore an associated increased risk of badger injury or mortality due to collision with vehicles. However, all construction vehicles within the Site will be limited to a maximum speed of 15km/h and main movements will be during the day when badgers are not active, and the risk will thus be considered to be negligible.

Other standard good practice mitigation measures will be implemented that avoid or reduce or, if necessary, offset for the risk of badger injury or mortality, as described in Section 9.6.

Considering both the availability of retained foraging habitat and the likely low numbers of badgers in the wider area, it is concluded that there will be **negligible** effect on badger during the construction phase.

9.5.12.2 Operational Phase

Disturbance

Given that no active badger setts are present within or in the vicinity of the Site, and that the majority of personnel will be on-site during the day, the potential for disturbance of badgers to be caused is very low. **Negligible** effects are predicted.

Injury or Mortality

As described in relation to the construction phase above, traffic will be restricted to a maximum speed of 15 km/h within the Site. The risk of collision injury or mortality as a result of the Proposed Development is low and any such incidences would be rare.

Negligible effects on badger are expected as a result of injury or mortality during the operational phase.

9.5.12.3 Decommissioning phase

The impacts which could arise during the decommissioning phase of the Proposed Development are likely to be consistent with those described for the construction phase and are therefore concluded to be negligible.

9.5.13 Impacts on Otter

9.5.13.1 Construction phase

Loss of Habitat

Whilst suitable habitat for otter exists surrounding the entire Tarbert Island coastline, there will be no loss of suitable habitat for otter to facilitate the Proposed Development, and therefore **No effect** on otter is predicted.

Disturbance

No otter resting sites were identified within the survey area and there is no potential for disturbance of animals using such a place of shelter. Otters currently living in the area are already habituated to a degree of human activity and are unlikely to be significantly further disturbed by construction works.

Negligible effects are expected on otter from construction-related disturbance.

Displacement

Otter will continue to be able to move freely across the Site, to the extent currently afforded by existing security fencing around the facility. While there may be some additional physical barriers to ensure safety, otter will continue to be able to access the Site through established gaps in perimeter fencing.

Negligible effects from construction-related displacement are therefore predicted.

Injury or Mortality

Injury by impact with construction traffic is improbable given the slow speed of vehicles on construction sites (15km/h). Given the lack of otter habitat within the Site compared to the surroundings, it would be unlikely otter would choose to enter a construction site during its operation. Therefore, the probability of otter harm during construction is very low.

For the purposes of EIA, and as set out previously, it is therefore concluded that there will be, at worst, **Negligible** effects during the construction phase.

9.5.13.2 Operational Phase

Disturbance

During the operational phase, the Proposed Development will be operated, maintained and managed by low numbers of SSE Tarbert personnel, similar to the current situation. Given the current level of human activity on-site, the Proposed Development is unlikely to cause any further disturbance impact to otters.

Negligible effects are expected on otter from operational-related disturbance.

9.5.13.3 Decommissioning Phase

The impacts which could arise during the decommissioning phase of the Proposed Development are likely to be consistent with those described for the construction phase. There will therefore be, at worst, a **Negligible** effect during the decommissioning phase.

9.5.14 Impacts on Other Protected Mammals

9.5.14.1 Construction Phase

Desk and field survey information indicates that hedgehog may occur in the Site and immediately surrounding area, and Irish hare was observed on Site. These species are protected under the Wildlife Acts but are relatively common and widespread in Ireland.

Loss of Habitat

There will be a very minor loss of scrub and grassland habitat within lay down areas of likely value to hedgehog and Irish hare. However, areas of dry meadows and grassy verges will remain in various parts of the Site, and areas of suitable grassland, scrub and woodland to the south and east of the Site will be unaffected by the Proposed Development and continue to provide foraging and shelter opportunities for both species.

Negligible effects are expected on these species from habitat loss.

Injury or Mortality

There is potential, without mitigation, for Irish hare and hedgehog to be injured or killed during construction. However, as set out in Section 9.6, standard measures will be implemented to reduce the likelihood of such an occurrence (e.g., capping pipes, covering excavations etc.). Similarly, construction traffic will be limited to a speed of 15km/h and works will take place during daylight hours. The potential for collision mortality of most species is therefore low, although would be greater for hedgehog, which is particularly vulnerable to this impact. Given the life history of these small mammals (which have several offspring and, in some cases, several large litters per year), population recruitment is fairly to very rapid and loss of a small number of individuals would be very unlikely to have a major effect on local populations. There are also not likely to be very large populations of these species within the Site owing to the dominance of hardstanding and buildings, which offer no shelter to such species.

It is therefore concluded that, at worst, there could be a **Temporary Adverse effect of Site significance** for the duration of the construction period.

9.5.14.2 Operational phase

There are not considered to be any adverse impacts on Irish hare or hedgehog during the operational phase. **No effect** is therefore predicted on these species.

9.5.14.3 Decommissioning phase

The impacts which could arise during the decommissioning phase of the Proposed Development are likely to be consistent with those described for the construction phase. Due to the potential for collision mortality with construction vehicles, a **Temporary Adverse effect of Site significance** could therefore arise.

9.5.15 Impacts on Breeding Birds

9.5.15.1 Construction Phase

A total of 33 species were recorded by the breeding bird survey carried out within the survey area. Of these, 13 species are considered to be of conservation concern. There is no habitat within the location of the proposed OCGT suitable for breeding birds, and no birds were identified breeding in this area.

Swallow were confirmed to be breeding in a small building in the south of the Site and ringed plover were breeding in the TEG site, adjacent to the Site. There will be no impacts on these birds as a result of the Proposed Development.

For breeding birds in general, there is a high likelihood (without mitigation) of accidental destruction of active nests during the construction phase through clearance of habitat, should this take place during the breeding season (01 March to 31 August, inclusive). Regardless of ecological significance, wild birds are protected under the Wildlife Acts from (in summary) wilful injury, wilful taking / destruction of eggs / nests and wilful disturbance of a wild bird on / near an active nest (with some exceptions in the Third Schedule; the hunting exceptions are not relevant to development).

The majority of passerine species do or can lay multiple clutches of eggs each year, thus the loss of one brood would likely be of relatively limited significance, and it can be expected that the local population of common breeding birds would easily recover, probably within the same year. The accidental destruction of active nests would not, therefore, adversely affect the local conservation status of any of the species thought to breed in the survey area.

It is therefore concluded that without mitigation, construction of the Proposed Development will have a **Temporary Adverse effect of Site significance**.

9.5.15.2 Operational Phase

During the operational phase, the Proposed Development will be operated, maintained and managed by SSE Tarbert personnel, similar to the current level of human activity on Site. This will ensure that the Proposed Development is unlikely to cause any impact to these breeding birds.

Operational activities will be restricted to areas of hardstanding which cannot support the nesting bird species identified in the baseline conditions. Operational activities will also comply with legislation protecting nesting birds. There will consequently be Negligible effect from mortality or injury of breeding birds.

The operational phase of the Proposed Development will have **Negligible** effects on breeding birds.

9.5.15.3 Decommissioning Phase

The impacts which could arise during the decommissioning phase of the Proposed Development are likely to be consistent with those described for the construction phase. **Temporary Adverse effects of Site significance** on breeding birds are expected during the decommissioning phase.

9.5.16 Impacts on Wintering Birds

9.5.16.1 Construction Phase

Based on the results of the recent 2022 / 2023 non-breeding bird surveys (detailed in Appendix 9E EIAR Volume II), there is relatively little use of the Site itself, compared to other areas outside of the Site along the coast which appear to be important areas for waterbirds, predominantly Tarbert Island Bay, and Tarbert Bay, both located within River Shannon and River Fergus Estuaries SPA. There was some use of the jetty (120m to 220m from Site) by generally small numbers of cormorant and gulls, although a large flock of 372 roosting black-headed gulls was noted on one occasion at the pier at the end of the jetty.

No construction works on the shore, intertidal zone or in the marine environment will be required as part of the Proposed Development. There will consequently be no loss of habitat used by wintering birds.

It is important to note that visual stimuli tend to have greater disturbance effects on birds than noise stimuli alone (as stated in Cutts *et al.* (2009)). Cutts *et al.* (2013) sets out the level of disturbance that can be expected from various types of construction works due to the noise and visual stimuli they generate.

However, even if disturbance from construction of the Proposed Development were to occur, evidence presented by Cutts *et al.*, (2013) suggests that such impacts are likely to extend to a distance of around 300m for the most sensitive species. There is abundant alternative habitat beyond 300m of the proposed OCGT location which will be the main source location of disturbance, including large mud flats, rocky coast, and sea, which will remain available for use by foraging / loafing birds.

Even if infrequent disturbance were to occur (although as stated, this is considered to be unlikely), the largest area of habitat which appears most suitable to wintering bird species is more than 300 m to the southeast of the Proposed Development and screened by buildings. There is not expected to be any disturbance impacts on birds using this area for these reasons and with the addition of mitigation detailed in Section 9.6. Additionally, even in the event that birds were disturbed from other smaller areas of habitat closer to the Proposed Development (e.g., Tarbert Island Bay), there is abundant alternative habitat very nearby. Within the wider environment, this becomes increasingly the case.

For the purposes of EIA, and as set out above, it is therefore concluded that there will be a **Negligible** effect on non-breeding waterbirds during the construction phase.

9.5.16.2 Operational Phase

The Proposed Development will result in no material change to abstraction or discharge rates or other parameters that could impact on the occurrence or distribution of fish in the estuary which are prey for multiple waterbird species.

The routine operation and maintenance of the Proposed Development will not require access for personnel or machinery beyond the boundary of the Site. It is therefore highly unlikely that the operational phase of the Proposed Development could displace birds from this area.

For the purposes of EIA, and as set out above, it is therefore concluded that there will be, at worst, **Negligible** effects during the operational phase.

9.5.16.3 Decommissioning Phase

The impacts which could arise during the decommissioning phase of the Proposed Development are likely to be consistent with those described for the construction phase. For the purposes of EIA, and as set out above, it is therefore concluded that there will be, be a **Negligible** effect on wintering birds during the decommissioning phase.

9.5.17 Impacts on White-tailed Eagles

9.5.17.1 Construction Phase

Following consultation with NPWS, it is known that the lower Shannon estuary has been one of the release sites for the national white-tailed eagle re-introduction programme. However, given that there is no habitat for the birds on Site to rest, breed or forage and that there are only limited trees at the front

of the power station site, away from the area where most construction works will take place, the construction of the Proposed Development has very limited potential for any significant disturbance on white-tailed eagles that occur in the Tarbert Island area.

There is a low risk of disturbance during the construction phase of the Proposed Development, especially during sensitive periods from mid - June into late Autumn when there is the highest likelihood of birds occurring in the area. Noise from piling is anticipated to fall below disturbance thresholds in areas potentially used by white-tailed eagles. Outside of this period the potential for disturbance is negligible.

For the purposes of EIA, and as set out above, it is therefore concluded that there will be, at worst, a **Temporary Adverse effect of National significance** during the construction phase.

9.5.17.2 Operational Phase

During the routine operation and maintenance of the Proposed Development, there will be no suitable habitat within the Site or within its ZOI for breeding or feeding. Birds may however forage and commute along the Shannon Estuary but would not be subject to any adverse impacts from the Proposed Development. For the purposes of EIA, and as set out above, it is therefore concluded that there will be, at worst, **Negligible** effects during the operational phase.

9.5.17.3 Decommissioning Phase

The impacts which could arise during the decommissioning phase of the Proposed Development are likely to be consistent with those described for the construction phase. By the time of decommissioning, it is anticipated that the Irish re-introduced population of white-tailed eagles will have become well established and dispersed across Ireland. No habitat will be available for the eagles on the Site, therefore impacts will be the same as during construction. For the purposes of EIA, and as set out above, it is therefore concluded that there will be a **Negligible** effect on white-tailed eagles during the decommissioning phase.

9.5.18 Impacts on Common Lizard

9.5.18.1 Construction Phase

Common lizard was not identified on Site, and there is little habitat present likely to support lizard. Any population on Site will be small owing to the dominance of hardstanding / buildings, and if present at all this species will be largely confined to scrub, grassland, and road verges. Aside from the centre of the Site which does not support suitable habitat, only small areas of scrub and grassland likely to be impacted by the Proposed Development may provide opportunities for shelter, foraging and basking. Other suitable habitat will be retained scattered throughout the Site and is present in the surrounding area.

The small area of habitat to be impacted is not known to support lizards and will only be impacted temporarily. Therefore, any impacts on a small population of common lizard are considered to result in a **Temporary Adverse effect of Site significance**.

9.5.18.2 Operational Phase

There are no impacts that could have a significant effect on common lizards during the operational phase. **No effect** is therefore predicted on this species.

9.5.18.3 Decommissioning Phase

The impacts which could arise during the decommissioning phase of the Proposed Development are likely to be consistent with those described for the construction phase. Should there be a requirement to remove habitat which could be used by this species, therefore, a **Temporary Adverse effect of Site significance** is possible.

9.5.19 Impacts on Invasive Non-native Species

9.5.19.1 Construction Phase

During the field survey, sea buckthorn (medium impact species) was recorded within the adjacent TEG site. Removal of this invasive species is being managed under that project, and thus it is unlikely that this species will spread to the Site. Even if seeds or propagules of this species enter the Site, they are unlikely to establish in the existing gravel hardstanding.

It is therefore expected that there will be **Negligible** effect from invasive non-native species.

9.5.19.2 Operational Phase

Invasive plant species within the adjacent TEG site will be removed prior to construction, and there is no potential pathway by which invasive non-native species could be spread during the operational phase of the Proposed Development. **No effect** is predicted.

9.5.19.3 Decommissioning Phase

Invasive species could potentially enter the Site during the operational phase of the Proposed Development, either via natural means or through introduction from Site personnel and vehicles. Invasive species could potentially have an impact on localised vegetation by crowding out existing flora, however, impacts are likely to be localised and therefore a Temporary Adverse effect of Site significance is possible.

9.5.20 Impacts on Marine Mammals

9.5.20.1 Construction Phase

Common bottlenose dolphins are a qualifying interest of Lower River Shannon SAC and two dolphins were observed swimming close to the jetty. Harbour porpoise and grey seal are QI of Blasket Islands SAC, harbour seal is a QI of Kilkiean Bay and Islands SAC, and bottlenose dolphin and grey seal are QI of Slyne Head Islands SAC.

No construction works on the shore, intertidal zone or in the marine environment will be required as part of the Proposed Development, consequently there will be no loss of habitat used by marine mammals.

Based on the hearing sensitivity studies, Southall *et al.* (2007) developed a series of sound thresholds, for auditory injury (i.e., hearing damage), both permanent and temporary, and disturbance for marine

mammals. For cetaceans, the thresholds are given in two metrics, an instantaneous sound pressure level (SPL) and a time averaged sound exposure level (SEL). The thresholds are:

- Permanent injury to hearing (called Permanent Threshold Shift) at:
- SPL of 230 dB re: 1 μ Pa (peak) (flat); and
- SEL at 198 dB re: (20 μ Pa)²

Behavioural disturbance (from a single impulsive sound source such as rock breaking) at:

- SPL of 224 dB re: 1 μ Pa (peak) (flat); and
- SEL at 183 dB re: 1 μ Pa²-s (Mht)

The Proposed Development will result in “regular” construction noise (typically 50-70dBA) with Mechanical Plant Sound Power Levels, including piling, (measured at source) typically ranging from around 94-122dBA LW (refer to Chapter 11, EIAR Volume 1). Underwater marine mammals are not considered to be vulnerable to noise which passes through air because the transmission of sound from air into water involves a significant loss of acoustic energy, primarily due to the impedance mismatch between the two media (Pierce, 2019). Although harbour and grey seal rest on land at haul out sites, the Shannon Estuary does not appear to be regularly used by either species, and only several individuals have been recorded during the past three surveys (Cronin et al. 2003; Morris and Duck, 2019) at significant distance from the Site.

While vibrations arising from piling depend on numerous factors, such as the energy used for piling, ground composition, and distance, vibrations attenuate rapidly and vibrations from hammer piling are very much reduced at distances of even up to 20m, and negligible at 50m (BS5228-1:2009+A1:2014 ‘Code of practice for noise and vibration control on construction and open sites’ (BS5228)). The same guidance provides piling vibration prediction methodologies up to a maximum of 110m, meaning that construction activities do not produce large enough vibrations to warrant concern beyond this range. The Shannon Estuary is located approximately 25m from the closest anticipated piling works, and vibrations from piling are not expected to reach the estuary at a level to disturb marine mammals. It may be the case that animals very close to the shore may be able to detect land-based piling noise but it is unlikely this would cause any significant disturbance. As highly mobile animals, marine mammals in the vicinity can easily move away.

Furthermore, habitats immediately within the estuary closest to the area of proposed piling are mudflats which, at low tide, extend at least 120m from the closest piling location. Therefore, at low tide, dolphin and harbour porpoise will not be within 100m of the piling works. At high tide, water depth above the mudflats at this location is unlikely to be greater than 3m, and at this shallow depth it is unlikely that either species will spend significant time at this depth in proximity to the piling works and are rather to be found in deeper waters of the Shannon Estuary further from the Site. Therefore, construction works are not anticipated to impact marine mammals.

For the purposes of EIA, and as set out above, it is therefore concluded that there will be a **Negligible** effect on marine mammals during the construction phase.

9.5.20.2 Operational Phase

The Proposed Development will result in no material change to abstraction or discharge rates or other parameters that could impact on the occurrence or distribution of fish in the estuary which are prey for marine mammals.

The routine operation and maintenance of the Proposed Development will not require access for personnel or machinery beyond the boundary of the Site. It is therefore highly unlikely that the operational phase of the Proposed Development could displace marine mammals from this area.

For the purposes of EIA, and as set out above, it is therefore concluded that there will be, at worst, **Negligible** effects during the operational phase.

9.5.20.3 Decommissioning Phase

The impacts which could arise during the decommissioning phase of the Proposed Development are likely to be consistent with those described for the construction phase. For the purposes of EIA, and as set out above, it is therefore concluded that there will be, be a **Negligible** effect on marine mammals during the decommissioning phase.

9.6 Mitigation Measures

Whilst significant adverse effects are not predicted, the following mitigation measures will be implemented as part of standard good practice. These are well-developed and have been successfully implemented on infrastructure projects across the country and there is a high degree of confidence in their success. They can therefore be treated as embedded mitigation. These will include:

- prior to the commencement of construction, a confirmatory survey for protected or notable species will be carried out to check for any changes to the baseline conditions described in this chapter. This will be completed not more than six months prior to the commencement of construction. The results will be reported and communicated to the appointed Contractor and appropriate avoidance / mitigation measures implemented, as required;
- all personnel involved in the construction, operation and decommissioning of the Proposed Development will be made aware of the ecological features within the ZOI of the Proposed Development and the mitigation measures and working procedures that must be adopted. This will be achieved as part of the induction process and through the delivery of Toolbox Talks;
- a suitably qualified Ecological / Environmental Clerk of Works (ECoW) will be employed for the duration of the construction of the Proposed Development. The ECoW will advise on and monitor implementation of ecological mitigation measures and compliance with legislative requirements in relation to ecological features. The ECoW will also carry out pre-works checks for protected and / or notable species and provide other ecological advice as necessary;
- a Contractor's Construction Environmental Management Plan (CEMP) will be updated prior to commencement of construction, to address any changed identified by confirmatory surveys.

The CEMP will set out all environmental management measures and the roles and responsibilities of construction personnel. A CEMP has been prepared as part of this planning submission, refer to Appendix 5A EIAR Volume II;

- during all phases of the Proposed Development (construction, operation and decommissioning), pollution prevention measures will be adopted including the following:
 - controls and contingency measures will be provided to manage run-off from construction areas and to manage sediment, as detailed in the CEMP (Appendix 5A, EIAR Volume II);
 - all oils, lubricants or other chemicals will be stored in an appropriate secure container in a suitable storage area, with spill kits provided at the storage location and at locations across the Site;
 - in order to avoid pollution impacts to soils and vegetation during construction, all refuelling and servicing of vehicles and plant will be carried out in a designated area which is bunded and has an impermeable base, and at least 50m from Lower Shannon Estuary;
- as far as possible, works that will directly impact upon areas of vegetation that could be used by nesting birds will be undertaken outside of the breeding season, 01 March to 31 August, inclusive. Should vegetation clearance works be required during the breeding season, a pre-works check for active nests will be carried out by the ECoW or other suitably experienced ornithologist. Such checks will be completed no more than 24-48 hours in advance of clearance works taking place as nests can be quickly established. Where any active nests are identified, suitable species-specific exclusion zones will be implemented and maintained until the breeding attempt has concluded;
- sightings of protected or notable species within the Site during the construction phase will be recorded. If any evidence or sightings of protected species is found within 30m of works, then works in that area will stop immediately and the ECoW will be contacted for further advice;
- any excavations will be left with a method of escape for any animals that may enter overnight, and will be checked at the start of each working day to ensure no animals are trapped within them;
- any pipes will be capped or otherwise blocked at the end of each working day, or if left for extended periods of time, and following checks to ensure no animals are trapped;
- as far as possible, works will be carried out in daylight to avoid or minimise the risk of disturbing protected species such as foraging / commuting bats and badger; and
- any artificial lighting required for construction works will be directional to avoid or minimise light spill.

Mitigation is not necessarily required where the effects on an ecological feature are considered to be Not Significant (which in this chapter is taken to be all effects of Local or Site significance). Given that effects on ecological features at this development are not significant, no mitigation is required.

The implementation of mitigation does not replace or negate the requirement for legislative compliance.

9.6.1 Protected Species Licensing

No licensing is currently considered necessary as there will be no impacts on the resting sites of protected species. However, if the ECoW should subsequently find new resting places of protected species, such as badger setts or bat roosts during pre-commencement surveys, that will be damaged, destroyed or disturbed by works, then derogation licence(s) may be required for those works to proceed. The ECoW will advise accordingly if this situation arises.

9.6.2 NPWS Contact Prior to Piling

NPWS will be contacted as a minimum of 1 week prior to commencement of any pile driving activity that may be planned. This will prevent the risk of significant disturbance to any white-tailed eagles during their sensitive periods.

9.6.3 Monitoring

On-going monitoring for protected species will be carried out by the ECoW, as required, for the duration of the construction phase. If this identifies a need for additional avoidance or mitigation measures, these will be communicated to the construction contractor and will be implemented with ECoW guidance as necessary, to ensure legislative and planning policy compliance on protected species and biodiversity preservation.

9.7 Residual Impacts

For the purposes of this chapter, only effects which are judged to be of County significance or higher are considered to be Significant, in EIA terms. On this basis, even in the absence of mitigation there are not expected to be any Significant effects on important ecological features from the construction, operation or decommissioning of the Proposed Development.

Following implementation of mitigation, the following non-Significant adverse effects are predicted from the Proposed Development:

- a permanent adverse effect of Site significance on recolonising bare ground and dry meadows and grassy verges due to minor loss during the construction and decommissioning phases;
- a temporary adverse effect of Site significance to other protected mammals; Irish hare and hedgehog during the construction and decommissioning phases as a result of potential mortality;
- a temporary adverse effect of Site significance to breeding birds due to the loss of habitat and destruction of nests during the breeding season during the construction and decommissioning phases; and
- a temporary adverse effect of Site significance on common lizard due to minor habitat loss during the construction and decommissioning phases.

All other effects, following implementation of mitigation, are predicted to be **Negligible** or **absent**.

9.8 Cumulative Impacts

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location²⁸.

Projects that have the potential to impact cumulatively with the Proposed Development to cause significant environmental effects are identified in Chapter 20 (Interactions EIAR Volume I) and are listed below in Table 9.12. Consideration has been given in this EIAR to those identified projects that may be proposed, approved and existing at the same time as the Proposed Development, which involve a permanent loss of habitat which is similar to that within the Site (and which may therefore support the same species), and / or which are of a sufficient scale that any impacts they may generate could realistically be expected to act cumulatively with the Proposed Development.

²⁸ CIEEM (2019).

Table 9.12: Projects within 5km of the Proposed Development which have the potential to act in-combination.

Planning Application	Date Submitted	Summary Details	Applicant	Status	Distance from the Site	Potential for In-Combination Effects
23350	31/03/2023	The Proposed Development will comprise of the following on a site measuring approximately 6.9 hectares: (1) removal of existing cable joint, bay within Tarbert generating station, 220Kv switchgear within the existing Tarbert substation compound and associated 220Kv cabling; (2) two no. new lengths of 220Kv underground cabling measuring approximately 340m each, running between two no. new underground cable joint base in Tarbert generating station and the connection point at Tarbert substation; (3) the new 220kv switchgear bay within the existing Tarbert substation compound comprising associated electrical equipment, including cable sealing ends, insulators, overhead conductors, surge arrestors, lightning masts and lighting poles; and (4) all ancillary site development works including temporary construction compound and a layout areas, site preparation works and ground levelling as required to facilitate the works. Tarbert generating station is licensed by the Environment Protection Agency (EPA) under the Industrial Emissions (IE) License (Ref: P0607-02). The Proposed Development includes works located within the IE License Boundary of Tarbert Generating Station which is an Upper Tier Establishment to which the Chemicals Act (Control of Major Accidents Hazards Involving Dangerous Substances) Regulations 2015 (the COMAH Regulations) apply. This planning is accompanied by a Natura Impact Statement (NIS).	EirGrid PLC	Further Information Requested	Within the site boundary.	The EirGrid proposed development boundary and the SSE Proposed Development boundary overlap and both occur within Tarbert Island, Co. Kerry. The proposed works for each project may overlap for the duration of the EirGrid development from Q3 2024 to Q4 2025. Any habitat loss to facilitate the development will likely be mainly to bare ground. Any loss of recolonising are ground, and dry meadows and grassy verges will be minor and temporary, as both will likely natural succeed back to the existing conditions. Minor disturbance to hares and possibly to hedgehogs will be negligible, given that most of the works will be to habitats not generally used by these species. Potential loss of habitat used by breeding birds will be minor, and alternative habitat will continue to be available during the overlap of both projects.
EE08.31583 8	17/02/2023	Application received under Section 4 of the Development (Emergency Electrical Generation) Act 2022 (the Act) for a	SSE Generation Ireland Ltd.	Granted Conditional 29/03/2023	0m - adjacent to the Site.	Given that development is scheduled to be completed prior to the start of the Proposed Development and there will be no overlap in construction phases,

Planning Application	Date Submitted	Summary Details	Applicant	Status	Distance from the Site	Potential for In-Combination Effects
		Proposed Development located at Tarbert Power Station, Tarbert, in the townland of Tarbert Island, Co. Kerry.				there will be no in-combination effects with the Proposed Development.
2332	23/01/2023	For development within the Moneypoint Generating Station, Carrowdotia North and Carrowdotia South, Kilimer, County Clare (Eircode V15 R963) which is licenced by the Environmental Protection Agency (EPA) under an Industrial Emissions (IE) Licence (Re P0605-04) and Upper tier COMAH site and therefore falls under the requirements of the Control of Major Accident Hazard Regulations (COMAH) Regulations, 2015. The development, which will be located at various locations within the station complex, will consist of land-based Site Investigations (SI) works comprising of boreholes and trial pits across the site.	Electricity Supply Board (ESB)	Granted Conditional 15/03/2023	3.66km north-west.	This application is for minor works which will be carried out at significant distance from the Proposed Development and which will not impact any of the habitats or species for which there may be residual effects. Therefore, no in-combination effects are anticipated.
21549	25/05/2021	A high inertia synchronous compensator (HISC) compound containing 1 no. HISC unit enclosed within a steel clad framed style structure (12.1m max height) and supported by 8 no. electrical equipment containers (containing ancillary power supply products including a static frequency converts, mv switchgear, exciters, lv distribution, control room, welfare and office, main auxiliary and start-up electrical transformers, generator circuit breaker, switchgear equipment, external cooler units and 1 no. back up diesel generator and associated diesel storage tank; (b) 220Kv high voltage gas insulated switchgear (GIS) substation compound containing a GIS substation building with all control and hv equipment within a single storey building (13.2m max height). The building will be surrounded by a compound road and contained within a 2.6m high galvanised steel palisade fence; (c) a battery storage compound containing 5 no. battery storage containers, enclosed in steel containers of dimensions approximately 13m by 2.5m by 3m, housing individual battery components with 2 fitted external	Donal Murphy Glencloosagh Energy Limited	Granted Conditional 19/07/21	1.7km south-west	This application is a significant distance from the Proposed Development and will not impact any of the habitats or species for which there may be residual effects. Therefore, no in-combination effects are anticipated.

Planning Application	Date Submitted	Summary Details	Applicant	Status	Distance from the Site	Potential for In-Combination Effects
		HVAC systems for each unit and supported by 13 no. inverter stations, 14 no. auxiliary transformers and control container; (d) 220kv underground cable to the existing adjoining EirGrid substation; (e) associated elements comprising various underground cables and ducts, equipment plinths, boundary security fence, compound lighting and palisade gates and fencing, security lighting, CCTV, internal access roads, hardstanding areas and all necessary foundations works for the above compounds. The planning application is on lands where grid stabilisation facility was previously permitted under planning register no 19/115. Planning permission to construct the development is sought for a period of 10 years. A Natura Impact Statement has been prepared in respect of the Proposed Development and accompanies the application.				
20850	18/09/2020	For changes to the previously permitted peak power plant development (planning ref. 13/138). It is proposed to change the energy source for the charging of the battery storage system (BESS) containers from diesel to charging off the national grid and to change the permitted layout for electrical equipment based on the consequence of the proposed change in energy source at an area located within the permitted development. It is also proposed to include a small metering enclosure adjacent to the constructed substation building within the permitted development. A five-year planning permission is being sought for the Proposed Development.	Kilpadouge Green Energy Ltd	Conditional 12/11/2020.	1.75km south-west	This application is a significant distance from the Proposed Development and will not impact any of the habitats or species for which there may be residual effects. Therefore, no in-combination effects are anticipated.
19746	26/09/2019	For development, on a c. 1.8 ha site located within Moneypoint Generating Station, Carrowdotia North and Carrowdotia South, Kilimer, County Clare (Eircode V15 R963) which is licensed by the EPA under an Industrial Emissions (IE) Licence (Ref. P0605-04) and Upper Tier	ESB	Granted Conditional 20/11/2019.	4.24km north-west.	This application is a significant distance from the Proposed Development and will not impact any of the habitats or species for which there may be residual

Planning Application	Date Submitted	Summary Details	Applicant	Status	Distance from the Site	Potential for In-Combination Effects
		COMAH sire and therefore falls under the requirements of the Control of Major Accident Hazard Regulations (COMAH), 2015. The Development, which will be located within a fenced compound c. 0.94ha. will consist of a 300 to 400 MVA (electrical rating) synchronous condenser, including the following elements: a) a generator and Flywheel building (c. 962 sq.m., c.15m high) to house equipment including the generator, flywheel lube oil skid, air compressor and pumps; b) supporting items of plant located within the compound including *cooling equipment (c. 690 sq. m., c. 3m high); *c 7m high modular containers to house electrical and control equipment (total area of c 384sq.m); * a generator step-up transformer (c.150 sq. m, c. 3m high); *c 7m high modular containers to house electrical and control equipment (total area of c. 384 sq.m); *a generator step-up transformer (c.150 sq. m c.8m high), auxiliary transformer (c.48 sq. m., c.3m high); and * an above-ground oil separator and collection pit (c.72sq.m) connections to existing site services networks including electrical, water and wastewater and an underground surface water attenuation tank connecting to existing surface water drains; c) all other ancillary and miscellaneous site works including site clearance; site access, internal roads and development of areas of hardstanding including a maintenance lay-down area; and d) the development will be bounded by a c.3m high chain-link fence. Site access will be by means of a new c. 2.7m high palisade gate accessed from existing roads within the station site. Planning permission is being sought for a duration for a duration of 10 years.				effects. Therefore, no in-combination effects are anticipated.
19115	12/02/2019	The development will consist of a grid stabilisation facility comprising of the construction up to 4 no. rotating stabilizers, 5 no. battery storage containers, 1 no. control room, 2 transformers and ancillary equipment within a site area of	Glencloosagh Energy Limited	Granted Conditional 25/10/2019	1.65km south-west	This application is a significant distance from the Proposed Development and will not impact any of the habitats or species for which there may be residual

Planning Application	Date Submitted	Summary Details	Applicant	Status	Distance from the Site	Potential for In-Combination Effects
		approx. 1.46 hectares. It is proposed to connect the Proposed Development to the adjacent EirGrid substation by underground cable which will traverse the permitted and under construction peaking plant. The rotating stabilisers will be supported by 10 no. electrical equipment rooms which will contain ancillary power supply products including a static frequency convert (SFC), mv switchgear, exciters and lv distribution, and step-up / down transformers. A heating ventilation and air conditioning system (HVAC) will be attached to each rotating stabiliser, 4 no. auxiliary transformers also proposed. The battery containers will house individual battery components with 2 no. fitted external HVAC system for each. 13 no. invertor stations and 14 auxiliary transformers are proposed for the battery containers. The entire site will consist of various underground cables and ducts, boundary securing fence, compound lighting and palisade gates and fencing, new internal access track, security lighting, CCTV, hardstanding areas and all necessary foundation works. Permission is also sought for 2 electrical transformers (up to 220kv), associated hv equipment and underground electrical grid connection cabling and ducting connecting the development to the national grid at the adjacent ESB/EirGrid substation. Planning permission is sought for a period of 10 years. A Natura Impact Statement accompanies this application.				effects. Therefore, no in-combination effects are anticipated.
18520	21/06/2018	The development at Moneypoint ESB will consist of a c7.5 MW capacity battery storage facility within a secured compound, on a 0.4 Ha site, and will subject to detailed design, commercial and technical considerations, include (a) up to 3 No. battery storage units (each typically comprising a containerised battery (c 12.2m x 2.5m x 3.2m), HVAC (c2.7m x 2.7m), inverter (c. 3m x 3m) and transformer (c 3.3m x 3.3m); (b) a 28 sq. m single-storey switchgear	ESB	Granted Conditional 24/07/2018	Approximately 4.5km north-west of the Site	This application is a significant distance from the Proposed Development and will not impact any of the habitats or species for which there may be residual effects. Therefore, no in-combination effects are anticipated.

Planning Application	Date Submitted	Summary Details	Applicant	Status	Distance from the Site	Potential for In-Combination Effects
		building; (d) ancillary electrical plant including a transformer and var support units; (e) a c.15.6m high lightning mast and c. 18m high SCADA communications mast; (f) a 2.6m high chain-link fence and vehicular access gates via the existing station road to the south of the site; (g) ancillary site works including site clearance and the installation of site services.				
18392	27/04/2018	Tarbert Island Tarbert Co Kerry construct a battery storage facility within a total site area of up to 2.2278ha, to include 50 no. self-contained battery container units with associated HVAC cooling units, 13 converter and 13 step up transformer container units, associated compound cabling and ducting, a grid transformer, a single storey substation / control building with welfare facilities, a cable route grid connection to the existing ESB substation building, maintenance lighting, security fencing, a CCTV monitoring system, and all associated ancillary infrastructure on lands within the Tarbert generating facility. A ten-year planning permission is being sought to construct the development.	SSE Renewables (Ireland) Limited	Granted Conditional 15/01/2019	Adjacent to the Site boundary.	This development, if constructed, would be constructed following the commissioning of the Proposed Development, and thus, there will be no overlap of construction phases between the two developments, and therefore no simultaneous disturbance to protected species for which there may be residual effects from the Proposed Development. This development may potentially involve removal of minor areas of recolonising bare ground and dry meadows and grassy verges, both of which are common and widespread habitats. No in-combination effects are considered likely due to the time factors involved.
18878	10/09/2018	For a 10-year permission to construct a battery energy storage system (BESS) facility on a total site area of up to 0.6ha that will provide grid balancing services to the Irish electrical grid, to include up to 26 no. self-contained battery container units with associated heating ventilation and air conditioning systems (HVAC), power conversion systems	Shannon Clean Tech Ltd	Granted Conditional 23/09/2019	1.86km south-west	This application is a significant distance from the Proposed Development and will not impact any of the habitats or species for which there may be residual

Planning Application	Date Submitted	Summary Details	Applicant	Status	Distance from the Site	Potential for In-Combination Effects
		(PCS), step-up transformers, control systems and ancillary electrical components, 1 no. single – storey substation control building and associated electrical infrastructure, 1 no. 110kV generator transformers, all necessary ground and foundation works, associated compound cabling and ducting, palisade security fencing and lighting, CCTV security cameras, new site access from existing private road, temporary construction compound and all associated ancillary infrastructure and site development works. A Natura Impact Statement is now submitted in support of the application.				effects. Therefore, no in-combination effects are anticipated.

It was determined that there is no potential for cumulative effects given the distance to any proposed developments, limited habitat loss within the Site, and lack of overlap between the construction phases.

9.9 Summary

With the above mitigation in Section 9.6 implemented, all of the effects are mitigated and will be **Not Significant**, either through construction pollution controls or implementation of measures to avoid significant harm to protected species populations. Thus, there will be **No Significant** effect to biodiversity and nature conservation as a result of the Proposed Development.

SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 10 Landscape and Visual

SSE Generation Ireland Limited

November 2023

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Table of Contents

10.	Landscape and Visual.....	10-1
10.1	Introduction	10-1
10.2	Policy	10-1
10.3	Methodology	10-4
10.4	Baseline Environment.....	10-19
10.5	Potential Effects	10-28
10.6	Mitigation Measures	10-46
10.7	Residual Effects	10-48
10.7.1	Decommissioning Phase	10-48
10.8	Do Nothing Scenario	10-48
10.9	Summary	10-49
10.10	References	10-52

Images

Plate 10.1:	Basis for Consideration of Significance of Effects	10-16

Tables

Table 10.1:	Landscape Value	10-8
Table 10.2:	Landscape Susceptibility Criteria	10-9
Table 10.3:	Landscape Sensitivity to Change Criteria	10-9
Table 10.4:	Indicative Criteria for Magnitude of Landscape Effects	10-11
Table 10.5:	Value of the View	10-12
Table 10.6:	Visual Susceptibility	10-13
Table 10.7:	Indicative Classification of Sensitivity of Visual Receptors	10-14
Table 10.8:	Indicative Criteria Descriptions for Visual Magnitude	10-15
Table 10.9:	Definition of Duration of Effects	10-15
Table 10.10:	Definition of Quality of Effects	10-15
Table 10.11:	Categories of Significance of Landscape and Visual Effects	10-16
Table 10.12:	Summary of Landscape and Seascape Effects at Operation	10-31
Table 10.13:	Summary of Visual Effects at operation	10-41
Table 10.14:	Summary of Visual Effects on Scenic Routes	10-42
Table 10.15:	Summary of relevant cumulative developments	10-43

Appendix

(Refer to EIAR Volume II)

Appendix 10A: Photomontage Booklet

Figures

(Refer to EIAR Volume III)

Figure 10.1: Landscape Designations Map

Figure 10.2: Zone of Theoretical Visibility (ZTV)

10. Landscape and Visual

10.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) describes the landscape and visual effects of the Proposed Development.

This chapter has been prepared in accordance with the 2022 Environment Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Reports as well as the 2013 Landscape Institute guidelines on preparing Landscape and Visual Impact Assessments as referenced in Section 10.10.

This Landscape and Visual Impact Assessment (LVIA) is accompanied by the following technical appendices:

EIAR Volume II, Appendix 10A: Booklet of Verified Views / Photomontages:

- A3 Photomontages of Tarbert (OCGT) generator and associated plant and equipment (prepared by 3D Design Bureau)

EIAR Volume III, Figures:

- Figure 10.1: Landscape Designations Map
- Figure 10.2: Zone of Theoretical Visibility (ZTV)

The Site boundary ('red line boundary') for the Proposed Development encloses an area of approximately 15.18 hectares (ha) and encompasses land within SSE Tarbert, which is an area of 42ha under the management of the Applicant.

Full details on the background and Site history are provided in EIAR Volume I Chapter 4 (Existing Site and Conditions), and details of the Proposed Development is provided in EIAR Volume I Chapter 5 (Description of the Proposed Development), and the Planning Statement submitted with this planning application.

Landscape and visual effects are interrelated with other environmental effects but are assessed separately. Whilst elements of the built heritage such as Listed Buildings and Conservation Areas are important elements of the landscape and contribute to its character and influence its quality and value, effects on the significance of these designated features and their setting do not form part of this assessment. Those are the subject of assessment in Chapter 08: Cultural Heritage.

10.2 Policy

10.2.1 European

The Council of Europe Landscape Convention (ETS No. 176) as amended according to the provisions of the Protocol of amendment to the Convention (CETS No. 219) as from its entry into force on 1 July 2021, provides guidelines for managing landscapes. The Convention is not an EU Directive. Countries that sign and ratify the Convention make a commitment to upholding the principles it contains within the context of their own domestic legal and policy frameworks. The convention was ratified by Ireland on

22 March 2002 and entered into force in Ireland on 01 March 2004. The European Landscape Convention requires *“integrate landscape into its regional and town planning policies and in its cultural, environmental, agricultural, social and economic policies, as well as in any other policies with possible direct or indirect impact on landscape.”*

10.2.2 National

10.2.2.1 National Landscape Strategy for Ireland 2015-2025

The ‘*National Landscape Strategy for Ireland 2015-2025*’ (NLS) was launched in May 2015 and promotes the sustainable protection, management and planning for the landscape. The NLS states that:

“The National Landscape Strategy will be used to ensure compliance with the European Landscape Convention and to establish principles for protecting and enhancing the landscape while positively managing its change. It will provide a high-level policy framework to achieve balance between the protection, management and planning of the landscape by way of supporting actions”. It also states that *“The Strategy sets out Ireland’s high-level objectives and actions with regard to landscape. It also positions landscape in the context of existing Irish and European strategies, policies and objectives, and outlines methods of ensuring co-operation at a sectoral and at a European level by the State”.*

10.2.2.2 Regional Seascape Character Assessment for Ireland

The ‘*Regional Seascape Character Assessment for Ireland*’, prepared for the Marine Institute and published in December 2020, presents the Regional Seascape Character Areas (SCAs) along the entire Republic of Ireland coast. The report describes ‘seascape’ as *“an area of sea, coastline and land, as perceived by people, whose character results from the actions and interactions of land with sea, by natural and/or human factors”*, and, similarly to Landscape Character Assessments, identifies, classifies, and describes seascape character at a regional scale by Seascape Character Types (SCTs) and SCAs. However, the Seascape Character Assessment takes into consideration specific characteristics associated with the coast such as:

- Maritime influence.
- Character of the coastal edge.
- Character of the immediate hinterland; and
- Human activity (presence or absence).

10.2.2.3 National Marine Planning Framework

The National Marine Planning Framework (NMPF) (2021) is a national plan on how to use Ireland’s seas over a 20-year horizon to 2040. The NMPF sits at the top of the hierarchy of plans and sectoral policies for the marine area. The NMPF has been informed by existing sectoral plans and will, in turn, be used to inform future cycles of those plans in an ongoing feedback loop. It provides a coherent framework in which those sectoral policies and objectives can be realised. It is the key decision-making tool for regulatory authorities and policy makers in a number of ways, including decisions on individual authorisation applications, which will have to secure the objectives of the plan, similar to the way that terrestrial plans form part of the decision-making toolkit in the on-land planning process.

10.2.2.4 Strategic Integrated Framework Plan for the Shannon Estuary

The Strategic Integrated Framework Plan (SIFP) for the Shannon Estuary was launched on 22nd November 2013 and developed by an interjurisdictional steering group to produce a land and marine based framework to guide the future development and management of the Shannon Estuary.

The SIFP identifies SSE Tarbert as a strategic zone for development to be prioritised for marine-related industry. The framework plan provides a range of guiding principles, objectives, and mitigation measures for development in this zone and the overall Shannon Estuary; the following is relevant to this chapter:

- **PHH MM 1:** *“Councils will provide for the long-term protection and improvement of the quality of the natural environment within the plan area and provide ecological and recreational linkages in order to enhance biodiversity, the conservation status of special habitats; air, water and soil quality as well as the amenity value of these areas”.*

10.2.3 Regional

The Proposed Development is solely located within the administrative area of Kerry County Council (KCC); however, given its prominent location along the River Shannon Estuary, this assessment has taken into consideration the potential landscape and visual effects of the Proposed Development from viewpoints located in Co. Clare and Co. Limerick. For this reason, the Clare County Development Plan 2023 – 2029 (Clare CDP) (2023) and the Limerick Development Plan 2022 – 2028 (Limerick CDP) (2022) have been reviewed and are discussed below. Relevant landscape designations are illustrated in Figure 10.1 (refer to EIAR Volume III).

10.2.3.1 Kerry County Development Plan 2022 – 2028

The Kerry County Development Plan 2022 – 2028 (Kerry CDP) is the main strategic planning policy document which guides the future renewal and development of Co. Kerry and came into effect on 15th August 2022. The Kerry CDP locates the Site within the Tarbert-Ballylongford Landbank which is zoned for ‘industry’.

The Kerry CDP considers the outstanding landscapes of the County as *“one of its most important economic assets”* which are *“important not only for their intrinsic value as places of natural beauty but also because they provide a real asset for residents and visitors alike in terms of recreation, tourism and other uses”*. As such, the Kerry CDP identifies and describes a number of landscapes, views, and prospects in Appendix 7 (Landscape Review), and sets out specific objectives aimed at protecting them. Relevant landscape policy objectives include:

- **KCDP 11-77:** *“Protect the landscapes of the County as a major economic asset and an invaluable amenity which contributes to the quality of people’s lives”.*
- **KCDP 11-78:** *“Protect the landscapes of the County by ensuring that any new developments do not detrimentally impact on the character, integrity, distinctiveness or scenic value of their area. Any development which could unduly impact upon such landscapes will not be permitted”.*
- **KCDP 11-79:** *“Preserve the views and prospects as defined on Maps contained in Volume 4”.*

- **KCDP 11-80:** *“Facilitate the sustainable development of existing and the identification of new Viewing Points along the route of the Wild Atlantic Way in conjunction with Fáilte Ireland, while ensuring the protection of environmental attributes in the area through the implementation of environmental protection objectives, standards and guidelines of this Plan”*; and
- **KCDP 11-81:** *“Prohibit developments that have a material effect on views designated in this plan from the public road or greenways towards scenic features and/or public areas”*.

Regardless of landscape designations, the Kerry CDP states that *“it is important that development in all areas be integrated into its surroundings in order to minimise the effect on the landscape and to maximise the potential for development”* and *“development in areas outside of designated areas, should, in their designs take account of the topography, vegetation, existing boundaries and features of the area”*. The Kerry CDP remarks that development which *“cannot be integrated into its surroundings”* will not be granted permission.

10.2.3.2 Clare County Development Plan 2023-2029

The Clare CDP is the main strategic planning policy document which guides the future renewal and development of Co. Clare to 2029 and beyond. The Landscape and Seascape Characters of Co. Clare are described within the Landscape Character Assessment of Co. Clare published in March 2004 and is referenced in the Clare CDP. Similar to the Kerry CDP, the Clare CDP sets out a number of policies aimed at protecting landscape, seascape, and visual designations. Although these are only applicable to proposed developments located within the boundaries of Co. Clare, given the location of the Proposed Development and the proximity to Co. Clare, this assessment has taken into consideration landscape designations and sensitivities as per those contained within the Clare CDP.

10.2.3.3 Limerick Development Plan 2022-2028

The Limerick CDP is the main strategic planning policy document which guides the future renewal and development of Co. Limerick to 2028 and beyond and outlines the landscape designations and sensitivities within the county, incorporating scenic views and prospects of the previous Limerick CDP 2010-2016 (as extended) to ensure continuity between and further development of landscape policies for rural Limerick.

Similar to the previous section, given the proximity of the Site to Co. Limerick, designations outlined by the Limerick CDP have also been taken into consideration for the purpose of this assessment.

10.3 Methodology

10.3.1 Landscape and Visual Impact Assessment Criteria

This chapter has been prepared in accordance with the following guidance documents:

- European Commission (EC) (2017). *Guidance on the preparation of the Environmental Impact Assessment Report*.
- EPA (2022). *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*.

- Government of Ireland (2018). *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*.
- Landscape Institute (2019). *Visual Representation of Development Proposals – Technical Guidance Note 06/19*; and
- Landscape Institute (UK) & Institute of Environmental Management and Assessment (IEMA) (2013). *Guidelines for Landscape and Visual Impact Assessment*.

Good practice guidance, such as the '*Guidelines for Landscape and Visual Impact Assessment (2013)*'¹, herein referred to as 'GLVIA3', provide specific guidelines for landscape and visual impact assessments. Therefore, a combination of the EPA guidelines, the Landscape Institute guidelines and professional experience has informed the methodology for the assessment herein.

The Landscape Institute guidelines require the assessment to identify, predict, and evaluate the significance of potential effects to landscape characteristics and established views. The assessment is based on an evaluation of the sensitivity to change and the magnitude of change for each landscape or visual receptor. For clarity, and in accordance with best practice, the assessment of potential effects on landscape character and visual amenity, although closely related, are undertaken separately.

The assessment acknowledges that landscape and visual effects change over time as the existing landscape external to the proposed development evolves and proposed planting establishes and matures.

The significance of an effect is determined by two distinct considerations:

- 1. The nature of the RECEPTOR likely to be affected, namely:
 - The susceptibility of the receptor to the type of change arising from the Proposed Development; and
 - The sensitivity to change is related to the value attached to the receptor.
- 2. The nature or magnitude of the EFFECT likely to occur, namely:
 - The size and scale of the landscape and visual effect (for example, whether there is a complete or minor loss of a particular landscape element).
 - The geographical extent of the areas that will be affected.
 - The duration of the effect and its reversibility; and
 - The quality of the effect, whether it is neutral, beneficial, or adverse.

10.3.2 Assessment Process

The assessment is undertaken based on the following key tasks and structure:

- Establishment of the Baseline or receiving environment.
- Appreciation of the Proposed Development; and

¹ Landscape Institute (UK) & IEMA (2013). *Guidelines for Landscape and Visual Impact Assessment (GLVIA)*, 3rd Edition.

- Assessment of effects.

10.3.3 Establishment of the Receiving Environment

A baseline study has been undertaken through a combination of desk-based research and site appraisal in June 2023 by Landscape Architects in order to establish the existing conditions of the landscape and visual resources of the study area. Desk based research has involved a review of mapping provided in county development plans, aerial photography by Google Earth, relevant planning and policy documents of local authorities namely Kerry, Clare and Limerick County Councils including associated Landscape Character Assessments (where available), and national policies and designations as referenced in Section 10.10.

Relevant landscape and visual designations are illustrated in Figure 10.1 (refer to EIAR Volume III).

10.3.4 Appreciation of the Proposed Development

In order to be able to accurately assess the full extent of likely effects on landscape character and visual amenity, it is essential to develop a thorough and detailed knowledge of the Proposed Development. This includes a comprehensive understanding of its location, nature, and scale, and is achieved through a review of detailed descriptions of the Proposed Development, drawings, and an on-site appraisal.

The landscape and visual impact assessment has considered all elements of the Proposed Development as detailed in Chapter 5: Description of the Proposed Development.

10.3.5 Assessment of Effects

The landscape and visual impact assessment seeks to identify, predict, and evaluate the significance of potential effects to landscape characteristics and visual amenity. The assessments are based on an evaluation of the sensitivity to change and the magnitude of change for each landscape or visual receptor.

The assessment acknowledges that landscape and visual effects change over time as the existing landscape internal and external to the Proposed Development evolves. The assessment therefore reports on potential effects during both construction (29 months) and operation (25 years); after this period, the Proposed Development may be either decommissioned or upgraded subject to electricity system and planning permission requirements, and potential modifications and amendments that would allow the asset to continue its operation. The prominence of the Proposed Development in the landscape or view will vary according to the existing screening effects of local topography, intervening existing vegetation, and building structures.

10.3.6 Scope

10.3.6.1 Study Area

A study area radius of 10km has been set from the boundary of the Site. The extent of the study area has been informed by desktop study and was verified on site during fieldwork surveys. This included desk-based reviews of published landscape and seascape character assessments and the wider landscape setting to determine the area which might be influenced by the Proposed Development. Considering the large scale of the Shannon Estuary and the existing Tarbert Power Station and

Moneypoint Power Station as reference points. a computer-generated Zone of Theoretical Visibility (ZTV) modelling was conducted and is included in Volume III, Figure 10.2: Zone of Theoretical Visibility (ZTV). An outline methodology of the ZTV mapping is included in Section 10.3.12 herein. The ZTV mapping was a helpful tool to identify viewpoint locations, which were later verified on site, and to understand where the Proposed Development will be visible and were not.

It is acknowledged that the Proposed Development may be visible from locations beyond the 10km study area, and as such it is important to note that the study area defines the area within which potential effects could be significant, rather than defining the extent of visibility. The study area captures long distance views of the Site to illustrate potential landscape and visual effects in often wide panoramic views. Beyond 10km, it is not considered that likely effects on views will be significant due to the effects of distance and the increasing dependency on clear weather conditions. The undulating topography of the wider landscape and the vegetative screening diminish and lessen the availability of views in the surrounding and wider landscape.

10.3.6.2 Effects Scoped Out

Effects arising from the decommissioning phase (after 25 years) of the Proposed Development are considered to be of a similar nature and duration to those arising from the construction process and have therefore not been considered separately in this report. Where this assessment refers to potential construction effects, these are also representative of predicted decommissioning effects.

10.3.7 Landscape Effects

Landscape effects describe the impact on the fabric or structure of a landscape or landscape character.

The assessment of landscape effects firstly requires the identification of the components of the landscape. The landscape components are also described as landscape receptors and comprise the following:

- Individual landscape elements or features.
- Specific aesthetic or perceptual aspects; and
- Landscape character, or the distinct, recognisable, and consistent pattern of elements (natural and man-made) in the landscape that makes one landscape different from another.

The assessment will identify the interaction between these components and the Proposed Development during construction and operational phases. The condition of the landscape and any evidence of current pressures causing change in the landscape will also be documented and described.

Landscape sensitivity

Paragraph 5.39 of GLVIA3 states that “*landscape receptors need to be assessed firstly in terms of their sensitivity, combining judgements of their susceptibility to the type of change or development proposed and the value attached to the landscape*”.

Landscape Value

Landscape value is frequently addressed by reference to international, national, regional, and local designations, determined by statutory and planning agencies. However, the absence of such a designation does not necessarily imply a lack of quality or value. Factors such as accessibility and local

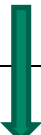
scarcity can render areas of nationally unremarkable quality, highly valuable as a local resource. The quality and condition are also considered in the determination of the value of a landscape.

With reference to GLVIA3, landscape value refers to the relative value that is attached to different landscapes by society. The definition and application of landscape value has also been informed by the Landscape Institute Technical Guidance Note 02/21: Assessing landscape value outside national designations.

The assessment of the value of each landscape receptor has been informed by the information set out in the baseline, including any relevant landscape designations, geographic criteria and valued attributes as set out in GLVIA3 Box 5.1, e.g., aesthetic, perceptual or experiential value.

Landscape value is assessed on a three-point scale, applying professional judgement and with reference to the criteria in Table 10.1 below.

Table 10.1: Landscape Value

Classification	Criteria
 Very High	The landscape is likely to be valued for one or more of its attributes at a national or regional level, and may be protected by a statutory landscape designation, e.g., National Park. The landscape may contain elements/features which are rare or perceived as very representative of the national or regional attributes and cultural associations. The landscape may provide a high scenic and landscape quality as well as many recreational opportunities.
	The landscape is likely to be valued for one or more of its attributes at a community or local level and may be designated by a landscape policy designation. The landscape may contain elements/features which are representative of the community or local level attributes and cultural associations. The landscape may provide some scenic and landscape quality and some recreational opportunities.
 Medium	The landscape is likely to be valued at a limited level only and not covered by any landscape designations. The landscape may contain features which are common and therefore do not specifically contribute to the wider landscape or cultural association. The landscape may provide a limited scenic and landscape quality and few recreational opportunities.
	The landscape is likely to be valued at a limited level only and not covered by any landscape designations. The landscape may contain features which are common and therefore do not specifically contribute to the wider landscape or cultural association. The landscape may provide a limited scenic and landscape quality and few recreational opportunities.
Very Low	

Landscape Susceptibility

GLVIA3 paragraph 5.40 defines landscape susceptibility as:

“the ability of the landscape receptor (whether it be overall character or condition of a particular landscape type or area, or an individual element and/or features, or a particular aesthetic and perceptual aspect) to accommodate the proposed development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies”.

The following aspects of the landscape are considered to be particularly susceptible to the change proposed:

- Overall agricultural character of the landscape.
- Sense of remoteness from development.

- Openness of landscape.
- Landscapes with sloping or elevated topography.
- Intricate, historic landscapes.
- Vegetation patterns formed by the network of hedgerows and blocks of woodland; and
- Sense of separation between existing settlements.

Landscape susceptibility is assessed on a three-point scale applying professional judgement and with reference to the criteria set out in Table 10.2.

Table 10.2: Landscape Susceptibility Criteria

Susceptibility Classification	Criteria
Very High	The receptor has a low capacity to accommodate the proposed development without effects upon its overall integrity. The landscape is likely to have a strong pattern/texture or is a simple but distinctive landscape and essentially intact. Undue consequences are likely to arise from the Scheme.
	
Medium	The receptor has some capacity to accommodate the proposed development without effects upon its overall integrity. The pattern of the landscape is mostly intact and/or with a degree of complexity and with features mostly in reasonable condition. Undue consequences may arise from the Scheme.
	
Very Low	The receptor is robust; it can accommodate the proposed development without effects upon its overall integrity. The landscape is likely to be simple, monotonous and/or partially degraded with common/indistinct features and minimal variation in landscape pattern. Undue consequences are unlikely to arise from the Scheme.

Landscape Sensitivity

Landscape value and landscape susceptibility is assessed separately and then combined to define the sensitivity of the landscape receptor, with reference to the criteria set out in Table 10.3.

Table 10.3: Landscape Sensitivity to Change Criteria

Landscape Sensitivity	Description
Very High	Landscapes of international or national value with distinctive and rare elements with a very high susceptibility to the Scheme.
High	Landscape of national or regional value with distinctive elements and characteristics, with a high susceptibility to the Scheme. Typically, these would be landscape receptors: • With distinctive elements and features making a positive contribution to character and sense of place. • Likely to be designated or are adjacent to the designated area but exhibit elements which underpin the designation, especially at the local scale. • Areas of special recognised landscape value through use (e.g., visitors), perception or historic and cultural associations. Likely to contain features and elements that are rare and could not be replaced.
Medium	Landscape of local or community value, with mostly common elements and characteristics, which by nature of their character would be able to accommodate some change. Typically, these would be landscape receptors: • Comprised of mostly common elements and features, creating a generally unremarkable character but with some sense of place.

Landscape Sensitivity	Description
	- Locally designated, or value may be expressed through non-statutory local publications. - Containing some features of value through use, perception or historic and cultural associations. Likely to contain some features and elements that could not be replaced.
Low	Landscape of community or limited value and relatively inconsequential elements and characteristics, the nature of which is potentially tolerant of substantial change of the type proposed. Typically, these would be; - Comprised of some features and elements that are discordant, derelict or in decline, resulting in indistinct character with little or no sense of place. - Not designated. - Containing few, if any, features of value through use, perception or historic and cultural associations. Likely to contain few, if any, features and elements that could not be replaced.
Very Low	Landscape of very low or limited value, which is damaged, degraded or a substantially modified landscape pattern with few or no natural or original features remaining, such that it is tolerant of change.

Magnitude of Landscape Change

Magnitude of change is an expression of the size or scale of change in the landscape, the geographical extent of the area influenced and the duration and reversibility of the resultant effect. The variables involved are described below:

- The extent of existing landscape elements that will be lost, the proportion of the total extent that this represents and the contribution of that element to the character of the landscape.
- The extent to which aesthetic or perceptual aspects of the landscape are altered either by removal of existing components of the landscape or by addition of new ones.
- Whether the effect changes the key characteristics of the landscape, which are integral to its distinctive character.
- The geographic area over which the landscape effects will be felt (within the Site itself; the immediate setting of the Site; at the scale of the landscape type or character area; on a larger scale influencing several landscape types or character areas); and
- The duration of the effects (short term, medium term or long term) and the reversibility of the effect (whether it is permanent, temporary or partially reversible).

Changes to landscape characteristics can be both direct and indirect. Direct change occurs where the Proposed Development will result in a physical change to the landscape within or adjacent to the Site. Indirect changes are a consequence of the direct changes resulting from the Proposed Development. They can often occur away from the Site (for example, off-site construction staff parking) and may be a result of a sequence of interrelationships or a complex pathway (for example, a new road or footpath construction may increase public access and associated problems such as littering). They may be separated by distance or in time from the source of the effects.

The indicative criteria applied to determine the magnitude of landscape effects are set out in Table 10.4. These are indicative and provide an example of considerations, supported and modified by explanative text in the LVIA.

Table 10.4: Indicative Criteria for Magnitude of Landscape Effects

Magnitude	Typical Criteria Descriptions
High	Large alteration to the landscape receptor or may impact an extensive area or unique characteristics at a local level. May be longer term impacts, permanent or reversible.
Medium	Partial alteration to the landscape receptor or may impact a wide area or characteristics at a local level. May be medium term impacts, permanent or reversible.
Low	Slight alteration to the landscape receptor or may impact a restricted area and few key characteristics. May be short to medium term impacts, permanent or reversible.
Very Low	Very slight alteration to the landscape receptor or may impact a limited area or no key characteristics. May be short term impacts, permanent or reversible.
None	No change to the landscape receptor.

10.3.8 Visual Effects

Visual effects are determined by the extent of visibility and the nature of the visibility (i.e., how a development is seen within the landscape); for example, whether it appears integrated and balanced within the visual composition of a view or whether it creates a focal point.

Negative visual effects may occur through the intrusion of new elements into established views, which are out of keeping with the existing structure, scale and composition of the view. Visual effects may also be beneficial, where an attractive focus is created in a previously unremarkable view, or the influence of previously detracting features is reduced. The significance of effects will vary, depending on the nature and degree of change experienced and the perceived value and composition of the existing view.

Receptors

For there to be a visual impact, there is the need for a viewer. Views experienced from locations such as settlements, recognised routes and popular vantage points used by the public have been included in the assessment. Receptors are the viewers at these locations. The degree to which receptors, i.e., people, will be affected by changes as a result of the Proposed Development depends on several factors, including:

- Receptor activities, such as taking part in leisure, recreational and sporting activities, travelling or working.
- Whether receptors are likely to be stationary or moving and how long they will be exposed to the change at any one time.
- The importance of the location, as reflected by designations, inclusion in guidebooks or other travel literature, or the facilities provided for visitors.
- The extent of the route or area over which the changes will be visible.
- Whether receptors will be exposed to the change daily, frequently, occasionally or rarely.
- The orientation of receptors in relation to the Proposed Development and whether views are open or intermittent.

- Proportion of the Proposed Development that will be visible (full, sections or none).
- Viewing direction, distance (*i.e.*, short-, medium- and long-distance views) and elevation.
- Nature of the viewing experience (for example, static views, views from settlements and views from sequential points along routes).
- Accessibility of viewpoint (public or private, ease of access).
- Nature of changes (for example, changes in the existing skyline profile, creation of a new visual focus in the view, introduction of new man-made objects, changes in visual simplicity or complexity, alteration of visual scale, landform and change to the degree of visual enclosure).
- Nature of visual receptors (type, potential number and sensitivity of viewers who may be affected).

Value attached to views

GLVIA3 stresses the importance of considering the value attached to views, for example in relation to heritage assets within the view, or through planning designations. It provides a list of indicators of the value of views in paragraph 6.37, including:

- Appearance in guidebooks or tourist maps.
- Provision of facilities, such as parking places, sign boards and interpretive materials; and
- References in literature or art.

The assessment of the value attached to views is also informed by the location of the viewing place and the quality or designation of the existing elements in the view, with reference to the criteria set out in Table 10.5.

Table 10.5: Value of the View

Classification	Criteria
Very High	Recognised or iconic views within nationally/internationally designated landscapes, such as National Parks, and/or national/international landmarks with views recognised in planning policy and/or management plans.
High	Views or viewing places identified in regional strategies.
Medium	Views across high quality landscape which might include features of interest, such as landmarks, which may be identified in a Local Area Plan.
Low	Views of relatively common landscape elements, likely to be valued by the communities which experience the view.
Very Low	Views across poor quality landscape with a high degree of detracting or common elements.

Visual Susceptibility

GLVIA3 identifies that the susceptibility of visual receptors to changes in views and visual amenity is a function of:

- the occupation or activity of people experiencing the view at a particular location; and
- the extent to which their attention or interest may therefore be focused on the views and visual amenity they experience at particular locations.

For example, residents in their home, walkers whose interest is likely to be focused on the landscape or a particular view, or visitors at an attraction where views are an important part of the experience often indicate a higher level of susceptibility. Whereas receptors occupied in outdoor sport, where views are not important, or at their place of work, are often considered less susceptible to change. Visual susceptibility criteria is outlined in Table 10.6.

Table 10.6: Visual Susceptibility

Classification Criteria

Very High	People visiting areas where the view is a very important part of the experience and specific to the reason for visiting the location.
High	People visiting areas where the view is an important part of the experience and/or residents with an expectation of enjoyment of the view.
Medium	People passing through the area where views are relevant to the experience of the journey but are not specific to the reasons for visiting.
Low	People passing through the area on secondary roads, where the view is not relevant to the activity. People working outdoors where the view is not relevant to the activity but may enhance it.
Very Low	People working in buildings where the view is not relevant to the activity or passing through the area of main road and rail networks, such that views are variable and expectation of enjoyment of them is secondary.

Visual Sensitivity

Sensitivity to change considers the nature of the receptor; for example, a person occupying a residential dwelling is generally more sensitive to change than someone working in a factory unit. The importance of the view experienced by the receptor also contributes to an understanding of the susceptibility of the visual receptor to change as well as the value attached to the view.

The following criteria, as set out in Table 10.7, have been referred to in determining the sensitivity of visual receptors from the combination of value and susceptibility. The criteria are included as an indicative example rather than definitive categories.

Table 10.7: Indicative Classification of Sensitivity of Visual Receptors

Classification Criteria

Very High	Viewers specifically visiting a designated view or highly promoted view of a designated landscape or international or national feature, in order to enjoy it.
High	Viewers with or undertaking activity with a particular interest or appreciation of the view (e.g., residents with principal private views, or people engaged in outdoor recreation whose attention is focused on the landscape and where people might visit purely to experience the view, such as promoted viewpoints) and/or a view of national value (e.g., within/towards a designated landscape).
Medium	Viewers with or undertaking activity with general interest or appreciation of the view (e.g., residents or people engaged in outdoor recreation that does not focus on an appreciation of the landscape, outdoor workers, people in schools or other institutional buildings and hotels and people passing through the landscape on defined scenic routes) and/or a view of local or community value (e.g., suburban residential areas, or agricultural land or urban areas).
Low	Activity where interest or appreciation of the view is secondary to the activity or the period of exposure to the view is limited (e.g., people at work, motorists travelling through the area or people engaged in outdoor recreation that does not focus on an appreciation of the landscape) and/or a view of limited value (e.g., featureless agricultural landscape, poor quality urban fringe).
Very Low	Activity where interest or appreciation of the view is inconsequential (e.g., people at work, or drivers of vehicles on main roads) and/or very low value of existing view (e.g., industrial areas or derelict land).

Magnitude of Visual Effects

Visual effects are direct effects as the magnitude of change within an existing view will be determined by the extent of visibility of the Proposed Development. The magnitude of the visual effect resulting from the Proposed Development at any particular viewpoint or receptor is based on the size or scale of change in the view, the geographical extent of the area influenced and its duration and reversibility. The variables involved are described below:

- The scale of the change in the view with respect to the loss or addition of features in the view and changes in its composition, including the proportion of the view occupied by the Proposed Development.
- The degree of contrast or integration of any new features or changes in the landscape form, scale, mass, line, height, sky lining, back-grounding, visual clues, focal points, colour and texture.
- The nature of the view of the Proposed Development, in relation to the amount of time over which it will be experienced and whether views will be full, partial or glimpses.
- The angle of view in relation to the main activity of the receptor, distance of the viewpoint from the Proposed Development and the extent of the area over which the changes will be visible; and
- The duration of the effects (short term, medium term or long-term) and the reversibility of the effect (whether it is permanent, temporary or partially reversible).

The magnitudes of visual effects are classified in Table 10.8. These are indicative and provide an example of considerations, supported and modified by explanative text in the LVIA.

Table 10.8: Indicative Criteria Descriptions for Visual Magnitude

Magnitude	Classification criteria
High	The Proposed Development will cause a pronounced change to the composition of the view or may be viewed in the foreground or directly. May be longer term effects, permanent or reversible and could include glint and glare effects.
Medium	The Proposed Development will cause a noticeable change to the composition of the view or may be viewed in the middle ground or indirectly. May be medium term effects, permanent or reversible and could include glint and glare effects.
Low	The Proposed Development will cause an unobtrusive change in the composition of the view or may be viewed in the background or obliquely. May be short to medium term effects, permanent or reversible and is not likely to include glint and glare effects.
Very Low	The Proposed Development will cause a barely perceptible change in the composition of the view or may be viewed in the background and very obliquely. May be short term effects, permanent or reversible and would not include glint and glare effects.
None	No change to the view.

The duration and quality of effects are classified in Table 10.9.

Table 10.9: Definition of Duration of Effects

Duration	Description
Temporary	Effects lasting one year or less.
Short Term	Effects lasting one to seven years.
Medium Term	Effects lasting seven to fifteen years.
Long Term	Effects lasting fifteen to sixty years.
Permanent	Effects lasting over sixty years.

The quality of both, landscape, and visual effects, can be Beneficial (Positive), Adverse (Negative) or Neutral according to the definitions set out in Table 10.10.

Table 10.10: Definition of Quality of Effects

Effect	Effect Description
Neutral	This will neither enhance nor detract from the landscape character or view.
Beneficial (Positive)	This will improve or enhance the landscape character or view.
Adverse (Negative)	This will reduce the quality of the existing landscape character or view.

10.3.9 Significance Criteria

The objective of the assessment process is to identify and evaluate the potentially significant effects arising from the proposed development. The assessment will identify the residual effects likely to arise from the finalised design taking into account mitigation measures and change over time. The significance of effects will be assessed by considering the sensitivity of the receptor and the predicted magnitude of effect in relation to the baseline conditions to the definitions set out in Table 10.11.

Table 10.11: Categories of Significance of Landscape and Visual Effects

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

The significance of the effect is determined by considering the magnitude of the effect and the quality of the baseline environment affected by the Proposed Development. The basis for consideration of the significance of effects is shown on **Plate 10.1**.

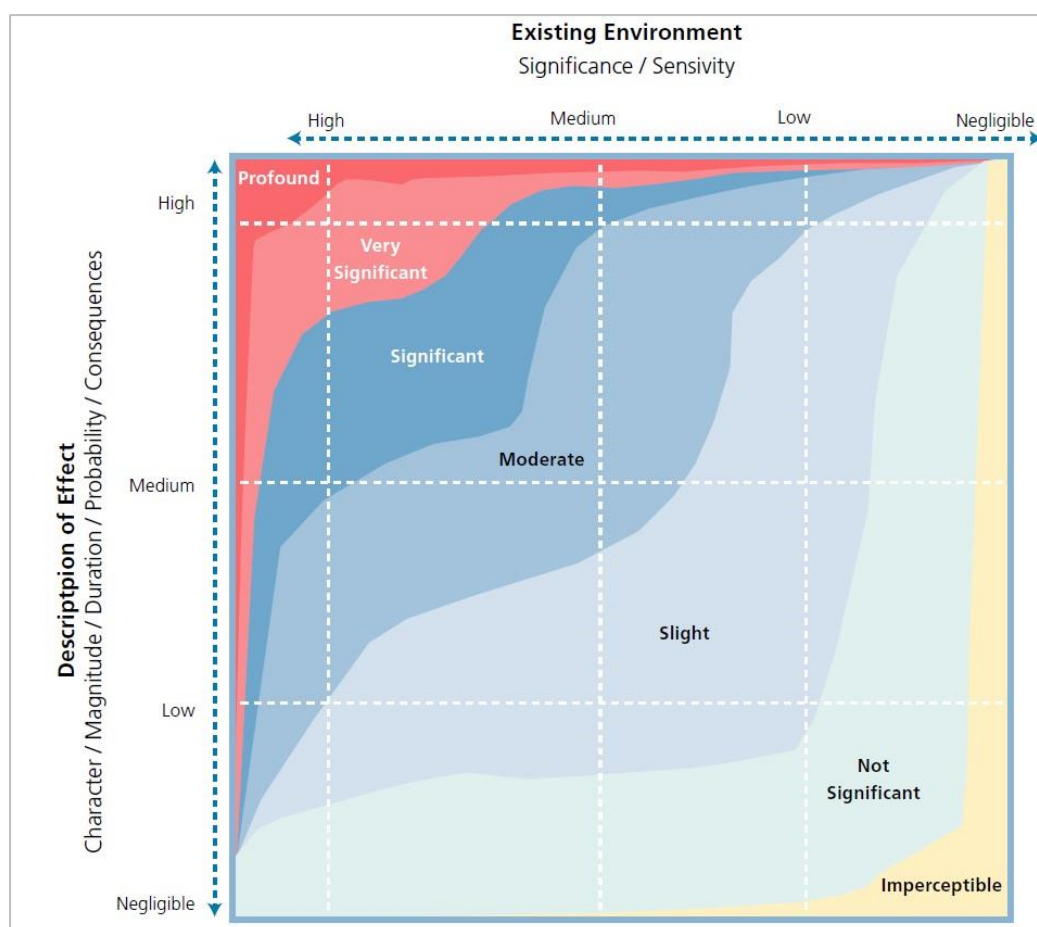


Plate 10.1: Basis for Consideration of Significance of Effects²

² EPA (2022). *Guidelines on the Information to be contained in Environmental Impact Assessment Reports*.

Effects will be assessed for all phases of the Proposed Development. Construction effects are temporary, and short-term effects which occur during the construction / decommission phase only. Operational / residual effects are those long-term effects, which will occur as a result of the presence or operation of the Proposed Development.

The quality of each effect is based on the ability of the landscape character or visual receptor to accommodate the Proposed Development, and the impact of the Proposed Development within the receiving context. Once this is done, the quality of the effect is then assessed as being neutral, beneficial or adverse. A change to the landscape or visual resource is not considered to be adverse simply because it constitutes an alteration to the baseline landscape.

10.3.10 Cumulative Landscape Effects

In addition to landscape and visual effects, it is also important to consider potential cumulative effects. The approach used to determine cumulative effects has drawn on guidance on cumulative impact assessment published by the GLVIA³. Cumulative landscape and visual effects may result from additional changes to the baseline landscape or views as a result of the Proposed Development in conjunction with other developments of a similar type and scale.

The cumulative assessment includes developments that are proposed and approved but not constructed yet and are similar in type and scale to the Proposed Development.

Potential cumulative developments have been reviewed from known planning applications available on Planning Search of Kerry County Council's website and at ABP planning register.

Magnitude of Cumulative Effects

The principle of magnitude of cumulative effects makes it possible for the Proposed Development to have major effects on a particular receptor, while having only minor cumulative effects in conjunction with other existing developments.

The magnitude of cumulative effects arising from the proposed scheme is assessed as **Very High, High, Medium, Low** or **Negligible**, with intermediate categories, based on interpretation of the following parameters:

- The additional extent, direction and distribution of existing and other developments in combination with the Proposed Development.
- The distance between the viewpoint, the Proposed Development, and the cumulative developments; and
- The landscape setting, context, and degree of visual coalescence of existing and Proposed Development and cumulative developments.

Significance of Cumulative Effects

As for the assessment of landscape and visual effects, the significance of any cumulative effects follows a same classification as illustrated in **Plate 10.1**, in **Section 10.3.10**, and will be assessed as **Profound, Very Significant, Moderate, Slight, Not Significant, and Imperceptible**.

³ Landscape Institute (UK) & IEMA (2013). *Guidelines for Landscape and Visual Impact Assessment (GLVIA)*, 3rd Edition.

10.3.11 Fieldwork

Site surveys carried out by the author of this chapter in June 2023 identified the potential visibility of the Proposed Development within the study area and the adjoining wider landscape, taking into account topography, existing screening vegetation and other localised factors. Viewpoint photography was taken in August 2023 by 3D Design Bureau. Deciduous trees show foliage and therefore does not illustrate the winter season scenario without foliage, i.e., worst-case scenario. However, existing screening provided has been accounted for when determining the magnitude of change of landscape and visual effects.

10.3.12 Zone of Theoretical Visibility Methodology

A bare earth ZTV was prepared using the European Digital Terrain Models (EU DTM) (Creative Commons Attribution 4.0 International) at a 30m resolution.

An assumed viewing height of 1.6m above ground level has been used to simulate the eye level of a person of average height.

Elements of the Proposed Development have been modelled as part of the ZTV including:

- the OCGT building at 30m; and
- the OCGT emissions stack at 55m.

10.3.13 Selection of Viewpoints

Viewpoint selection has been carried out according to the following current good practice guidelines:

- Landscape Institute Advice Note 01/2011. *Photography and Photomontage in Landscape and Visual Impact Assessment*.
- Landscape Institute (UK) & IEMA (2013). *Guidelines for Landscape and Visual Impact Assessment' (GLVIA)*, 3rd Edition.

It is not feasible to take photography from every possible viewpoint located in the study area. Photography has been taken from viewpoints, which are representative of the nature of visibility at various distances and in various contexts. Viewpoint photography is used as a tool to come to understand the nature of the potential residual effects. The selection process of viewpoint locations is as follows:

- The location of viewpoints within the study area is informed by desktop and site surveys as well as ZTV mapping.
- Identification and selection of representative viewpoints showing typical open or intermittent views within a local area, which will be frequently experienced by a range of viewers; and
- Identification and selection of specific viewpoints from key viewpoints in the landscape such as routes or locations valued for their scenic amenity, main settlements etc.

10.4 Baseline Environment

10.4.1 Site Context

The landscape in the surrounding environs of the Proposed Development has been modified by a number of constructed elements, including SSE Tarbert which, when combined with the existing Moneypoint Power Station at the northern shore of the Shannon estuary, forms a significant cluster of industrial power infrastructure along the estuary. The Site is accessed from the N67, which terminates to the west of the existing SSE Tarbert site at the Tarbert Ferry crossing point (Tarbert – Killimer Ferry), connecting counties Clare and Kerry. The landscape to the south of the Site and the existing SSE Tarbert is comprised of fields in agricultural pasture with hedgerows, treelines and interspersed with connecting parcels of woodland associated with Tarbert House. There is a small number of residential receptors located in close proximity to the south and south-west of the Site. The village of Tarbert is the main centre of population in the area and located approximately 1.8km south where the settlement extends along the N69, the main Tralee to Limerick Road, the L1010 local road and the R551 regional road.

The Shannon Estuary is the dominant landscape and visual feature in the area, approximately 2.5km wide at this point and identified as a Special Protection Area (SPA) and Special Area of Conservation (SAC). Tarbert Bay is a proposed Natural Heritage Area (pNHA) under the Wildlife Act 2000 (as amended).

Across the estuary to the north, the Clare CDP designates the area around Clonderalaw Bay as a 'Heritage Landscape 3: The Fergus / Shannon Estuary'. Heritage Landscapes are described as *"areas where natural and cultural heritage are given priority and where development is not precluded but happens more slowly and carefully"*.

The Wild Atlantic Way, a major tourism asset and visitor attraction, the route passes close to the boundary of the Site along the N69. Several segments along this road are identified as scenic views in the Kerry CDP. The Tarbert to Killimer Ferry to the east and Carrigafoyle Castle to the west are Discovery Points on the Wild Atlantic Way.

10.4.2 Landscape Character

The key role of Appendix 7: Landscape Strategy of the Kerry CDP is to assist in the achievement of sustainable development by promoting an approach to landscape planning and management which links objectives and recommendations for landscape character to current planning policies (see Section 10.2.3.1 of this report). Similarly, the Clare and Limerick CDPs also include a classification and description of landscapes and views and prospects in these counties. The relevant landscape categories and assets located within the study area discussed in the following sections.

10.4.2.1 Co. Kerry Landscape Designations

According to the Kerry CDP, there are two landscape designations for the county: 'visually sensitive areas' (VSAs) and 'rural general'. Visually sensitive areas are designated as such due to the combination of their elevated landscape value, sensitivity, and importance, and are particularly sensitive to alteration. Developments proposed within VSAs *"will only be considered subject to satisfactory integration into the landscape and compliance with the proper planning and sustainable development"*

of the area". In contrast, general rural landscapes "generally have a higher capacity to absorb development". The Site is not within but adjacent to a VSA south of SSE Tarbert.

The Kerry CDP also provides a classification of the county based on Landscape Character Areas (LCAs). The Landscape Review (refer to Appendix 7 in Kerry County Development Plan 2022-2028) subdivides the county into landscape types and landscape character areas. The Site is located within landscape type "J - Urban Area". Adjacent agricultural lands to the south are classified as "C - Pasture with mature hedgerows" and the parcel of woodland around Tarbert House is identified as "G - Deciduous Woodland", which is considered a valuable resource in terms of both biodiversity and by contributing to a varied, interesting and attractive landscape.

The Proposed Development is located within Landscape Character Area (LCA) 2 – The Shannon Estuary where the landcover is as follows:

"In general pasture covers the majority of the area. Some pockets of forestry (coniferous plantations) can also be found. Broad-leaved forestry is found to the north of Tarbert, between the town and the port area on the estuary. Some large peat bogs are also found in the area".

The Shannon Estuary LCA has the following landscape values:

"The northwest of the area is designated as Secondary Special Amenity in the Kerry County Development Plan 2015-2021. There are views & prospects eastwards from a local road on the western side of Knockanore, and northwards from the coast road towards the Shannon Estuary. This coast road is also part of the Wild Atlantic Way.

This area includes Knockanore which currently has no landscape designation. Due to its elevation and prominent position in a predominantly flat landscape it could therefore be considered for a landscape designation. The south-eastern part of the area is flat and open, which is overlooked by higher ground, it could therefore be considered for a landscape designation".

Part of the area within this LCA has an overall medium sensitivity, with the remainder having medium/high sensitivity. The entirety of the Site is identified within the descriptions of this LCA as being under an area of high/medium sensitivity. The visual sensitivity of LCA 2 – The Shannon Estuary has been classified as Medium / High.

10.4.2.2 Co. Clare Landscape Designations

To the north of the Proposed Development, across the estuary, the study area covers two Landscape Character Types (LCTs) within Co. Clare as described in Clare CDP 2023-2029:

- Farmed Lowland Ridges: The land cover is pasture, deciduous woodland and scrub and follows a linear ridge topography.; and
- The Farmed Rolling Hills: The land cover consists of a mosaic of forestry and pasture/ grassland, no drumlins and rolling uneven topography. Infrastructure can be highly visible across this landscape type. Views are afforded from more elevated hills across the surrounding areas and to the Shannon estuary.

These two LCTs are grouped into one LCA, i.e., the Shannon Estuary Farmland, which is an area that extends from Ballynacally in the north along the R473, encompassing the Labasheeda peninsula and continuing along the Shannon estuary to Kilrush and is fringed by the Kilrush farmlands to the north.

In addition to the above, the Clare CDP categorises the landscape of the County into three 'Living Landscapes', i.e., *"areas that have similar characteristics for which similar planning policies are applicable"*. The Clare CDP provides a description for these areas which *"outline the vision and future roles of the landscape areas together with policies/objectives that will guide development in these areas"*.

The three categories have differing objectives as follows:

- **Settled Landscapes:** Areas where people live and work.
- **Working Landscapes:** Intensively settled and developed areas within Settled Landscapes or areas with a unique natural resource; and
- **Heritage Landscapes:** Areas where natural and cultural heritage are given priority and where development is not precluded but happens more slowly and carefully.

The study area includes all three categories. Sections of Heritage and Working Landscapes are located along the coasts while the remainder of the study area covering Co. Clare comprises Settled Landscapes. Heritage Landscapes are located along the coasts of Clonderalaw Bay with Working Landscapes to the east and west of these areas. Working Landscapes to the east include Moneypoint Power Station and ancillary developments.

10.4.2.3 Co. Limerick Landscape Designations

The Limerick CDP) provides information, objectives and policies of relevance to the landscape character assessment and visual environment for the areas on the south bank of the River Shannon and River Shannon Estuary approximately 1km east of the Proposed Development.

The south-eastern section of the study area covers parts of Co. Limerick. This area is located within the Shannon Coastal Zone LCA which is described in the Limerick CDP as:

"This zone comprises a large area of northern Limerick and is bounded on one side by the Shannon Estuary, while its southern boundary is defined by the gradually rising ground, which leads onto the agricultural zone and the western hills to the southwest. The presence of the estuary is the defining characteristic of the region. The landscape itself is generally that of an enclosed agricultural type, essentially that of a hedgerow dominant landscape. This differs from the other agricultural landscapes of the County, in that the field patterns, particularly close to the Estuary, tend to be less regular than those elsewhere in Limerick".

The presence of the estuary is the defining characteristic of the region. The landscape is not awarded a sensitivity rating in the Limerick CDP, however, given the calibre of landscape and seascape attributes and landscape features both natural and manmade and the similarity of quality to the Kerry CDP Shannon Estuary, the landscape value is considered High, the sensitivity is considered Medium – High and the susceptibility to landscape change is considered High.

The Limerick CDP also refers to a range of specific objectives for each LCA; for the Shannon Coastal Zone LCA, a relevant objective includes the following: *“development under the SIFP to adhere to the mitigation measures for landscape management as appropriate”*.

10.4.3 Seascape Character

10.4.3.1 Co. Kerry

There are currently no planning specific references to a Seascape Character Assessment or a definition of seascape designations in the Landscape Review appendix to the Kerry CDP.

10.4.3.2 Co. Limerick

There are currently no planning references to a Seascape Character Assessment or a definition of seascape designations in the Limerick CDP.

10.4.3.3 Co. Clare

The Clare CDP and the associated Landscape Character Assessment includes details on Seascape Character Areas (SCA) along the shores of Co. Clare. Figure 10.2 (refer to Volume III of this EIAR) indicates the location of relevant SCAs located within the study area, namely, the SCA 10 Lower Shannon and the SCA 11 River Shannon.

The SCA 10 Lower Shannon is *“situated between Kilcredaun Point and Lynchs Point (east of Money Point)”* and comprises *“long sand and shingle beaches with an exposed feel when winds are from the southwest”*. In terms of its history and human influences, the Landscape Character Assessment states:

“There is a monastic complex, possibly from the sixth century, and medieval round towers and churches on Scattery Island. It remained a pilgrimage and burial site after the Elizabethan slighting of the monastery and the island's conversion to a defensive fort (its pattern – or penitential round – was suppressed in the early 1800s)”.

The following information is provided in relation to the condition and sensitivity of this SCA:

“The condition of the seascape is moderate becoming poorer closer to the River Shannon SCA. Power stations and windfarms are dominant features degrading views across the water in Co. Kerry and Limerick. Changes would be evident due to low lying and exposed nature of the area”.

The key characteristics of this SCA are:

- The River Shannon in this area is wide, creating a greater coastal than estuarine sense.
- Views from Kilrush to Scattery Island and Hog Island.
- Settlement is concentrated around Kilrush including caravan parks and golf club.
- Pylons and Money Point Power Station are prominent features.
- Kilrush is a designated Heritage Town and Sea Angling Centre.
- Kilrush Marina is a major infrastructure providing 120 berths at all stages of the tide. It has been awarded Blue Flag status.
- Scattery Island is a designated ACA (Architectural Conservation Area); and

- There are views across to Ballylongford and Co. Kerry.

Regarding development along the coastline, the Landscape Character Assessment states that:

- *“Liaison with Kerry and Limerick County Council should be undertaken with reference to all proposed developments along their coastline”.*
- Forces for change: *“Coastal development in prominent locations which would detract from the seascape value of the area e.g., power station, wind farms, marinas, etc. within view on the Kerry and Limerick coastline...”; and*
- Principles for Seascape Management: *“... Linear urban development should be avoided, and all other development should be screened appropriately”. “Views to the coastline of Limerick and Kerry should be retained”. “Promote agricultural and environmental schemes to avoid dereliction of coastal based landscapes ...”.*

The SCA 11 River Shannon *“extends from Limerick to east of Money Point”* and *“is bounded by Kerry Head to the South and Kilrush farmlands to the North”*. Its geology and landform are described as:

“The River Shannon SCA consists of a shallow low-lying and muddy linear coastline. This area is composed of a prominently ridged landscape, with linear hills aligned south-west to north-east. The coastal fringe is flatter and slopes towards the Shannon. It also becomes increasingly flatter towards Kilrush”.

In terms of its condition and sensitivity:

“The estuary is in moderate to good condition. However, industrial, and commercial activity dominates the view from land to sea.

Low lying, flat and open views to sea increase the area's sensitivity to change particularly from shipping and industrial activities”.

The key characteristics of this SCA are:

- Coastal fringe is flatter and slopes down towards the sea.
- Views to scattered farmhouse settlements.
- Deep water berthing facilities.
- Views of shipping, commercial, industrial activity, pastureland and forestry.
- Focal point for travelling the waterways of Ireland.
- Shannon Airport is a landmark transport node of transcontinental significance (also, Fergus Estuary Seascape Area below); and
- Car ferry service to Tarbert along the north coast of Co. Kerry.

Regarding development along the coastline, the Landscape Character Assessment states that:

- Forces for change: *“Visible impacts of shipping and commercial activity Plantations of coniferous forestry ...”; and*

- Principles for Seascape Management: “... *Best practice forestry guidelines should be adhered to in order to avoid inappropriately siting or design of plantations. Infrastructural developments including road widening along the coastline should consider local landscape character. Linear development along the coastline should be avoided and all other development should be screened appropriately. ...*”.

10.4.3.4 National Marine Planning Framework (NMPF)

The NMPF sets out the following planning policies in relation to seascape and landscape:

‘Seascape and Landscape Policy 1: *Proposals should demonstrate how the likely significant impacts of a development on the seascape and landscape of an area have been considered. Proposals will only be supported if they demonstrate that they, in order of preference:*

- avoid,*
- minimise, or*
- mitigate*
significant adverse impacts on the seascape and landscape of the area.
- If it is not possible to mitigate significant adverse impacts, proposals must set out the reasons for proceeding.*

This policy should be included as part of statutory environmental assessments’.

It also states the following (extract):

‘Many areas of our coastline are distinctive for their natural beauty and their diverse range of activities.

This policy aims to make sure that proposals consider their potential impacts on the seascape and landscape of an area. This is not only important for the protection of iconic views and character but also to aid in the process of enabling development where it is most appropriate.

The effects of development, such as through wind and tidal energy projects, port development, coastal defences, cable landings and pipelines, on an area’s seascape and landscape should be considered.

This is not only for individual areas, but also for the contributions they make to nationally designated sites and their settings. Increased footfall from tourism and recreation activities may raise the awareness of an area, but it can also change marine character and the visual resource. Routing and site selection are important tools in ensuring that impacts on seascape and landscape are minimised and mitigated ...

The final part of this policy identifies the need to set out the reasons for proceeding where significant adverse impacts on the seascape and landscape of the area cannot be avoided, minimised or mitigated. Where this is required, reasoning should include how optimisation of space might be achieved, what measures are proposed to minimise and mitigate significant adverse impact (if such steps are not possible, a description of why this is), as well as setting out the reasons why a given proposal should proceed in light of the likely impact ... ‘.

As part of the definition and classification of Ireland's Seascapes a Regional Seascape Character Assessment (RSCA) coordinated by the Marine Institute was prepared.

Seascape character assessment represents a core component of the evidence base for Marine Spatial Planning and marine policy formulation. Seascape character assessment (SCA) has emerged as a method for assessing, characterising, mapping, and describing seascape character.

Seascape is defined as 'an area of sea, coastline, and land, as perceived by people, whose character results from the actions and interactions of land with sea, by natural and/ or human factors', according to the definition from 'An Approach to Seascape Character Assessment, Natural England 2012.

The assessment distinguishes between Regional Seascape Character Types and Regional Seascape Character Areas and provides a high-level description of these without classifying the landscape and visual value and sensitivity of these designations.

The Shannon Estuary, including onshore areas of Counties Kerry, Clare and Limerick and captured within the study area, is located within the following seascape character:

Regional Seascape Character Type: 2 – Large Estuary

The Shannon Estuary is part of this character type and has the following principal drivers:

- *'Partially enclosed coastal body associated with confluence of large rivers.*
- *Complex tidal patterns of tidal channels associated with ebb and flow of tidal streams. Mudflats, and small islands present.*
- *Commonly zone of deposition Sloping landform with inlets and small islands.*
- *Deciduous woodland fringes occasional shorelines.*
- *Transitional zone between freshwater and marine with rich habitat for a range of flora and fauna; and*
- *Long history of human activity and habitation associated with sheltered rich estuarine environment'.*

Regional Seascape Character Area: SCA8 – Shannon Estuary and Tralee Bay

The below is an extract of a wealth of information provided in the overall assessment document:

"The SCA extends eastwards from Limerick including the Shannon Estuary, Mouth of the Shannon from Kilcredaun Point to Kilconley Point, extending landward to the north at Loop Head, encompassing Kerry Head and Brandon Head (Brandon Point/ Dulick Point). This SCA extends 12 nautical miles offshore".

Vistas and Views (extract)

- *"Within the estuary views are across the channel with parts of the views framed by the indented shoreline and strips of woodland close to the shoreline, often associated with former demesne landscapes. The vertical features of industrial units such as the towers of Moneypoint and Tarbert help to situate views within this area as it largely low lying and sloping to the shoreline. Whilst industrial elements can be a feature within this part of the SCA, the eye is often drawn*

to the interesting and diverse inlets with wooded shorelines, small rocky shores and a dynamic intertidal zone.

- *At the elevated parts of this SCA, the views become expansive and long views are possible north and south; where sea stacks and cliffs are visible, they draw the eye and the crashing waves against the rocks can dominate the view.*
- *Lighting – clusters of lighting associated with the larger settlements and villages can be seen across the estuary and along the coast. Lighting at Tarbert, Moneypoint, Auginish can be seen associated with stacks and chimneys. The light spill from Limerick City is also visible closer to the city”.*

10.4.4 Future Baseline

In the absence of the Proposed Development, the future landscape and visual baseline across the Proposed Development site is anticipated to remain broadly similar as stated above. However, changes to the adjacent existing SSE Tarbert Power Station buildings may occur and other power generating facilities adjacent to the site may be developed (refer to Section 10.5.3 Cumulative Effects) affecting the landscape and seascape character as well as the visual amenity.

10.4.5 Scenic Routes, Views & Prospects

A number of scenic routes and views & prospects are located within the study area and are listed below and mapped in Figure 10.1 (refer to Volume III of this EIAR).

County Kerry

- Views east and southeast of Tarbert Bay along the N69. This section is also part of the Wild Atlantic Way driving route.
- Estuarine views east and northeast along sections of the L6010 towards Carrigafoyle Castle north of Ballylongford. This section is also part of the Wild Atlantic Way driving route.
- Views west of Lislaughtin Abbey from a short section of the L1010 northeast of Ballylongford.

County Limerick

- N69 between Tarbert and Foynes included a looped route south across higher ground to Glin.

County Clare

- Coast road southeast of Cappagh to Carrowdotia South including sections of the N67.

10.4.6 The Wild Atlantic Way

According to Fáilte Ireland, the Wild Atlantic Way is a “defined touring route, stretching along the Atlantic coast from Donegal to West Cork”.

Sections of this touring route are located with the study area in Co. Kerry, Co. Limerick and Co. Clare as mapped in Figures 10.1 (refer to Volume III of this EIAR). Sections of designated views and prospects as well as scenic routes use the same route/ locations as the Wild Atlantic Way.

Sections of the Wild Atlantic Way located within the study follow the route of the R551 in either direction to Ballylongford and Tarbert, the L6010 to Carrigafoyle Castle, the N67 between Tarbert and Tarbert

Ferry Port, the Tarbert-Killimer Ferry Route, sections of the N67 between Killimer and Kilrush but deviating from N67 to the coastal road and the R473 into Kilrush before joining the N67 again. It also extends east from Tarbert towards Foynes along the N69.

The Kerry CDP states the following:

“The Wild Atlantic Way has a number of existing viewing points along its route. In order to maximise the potential of the Wild Atlantic Way these existing viewing points will be protected. The Council will work with Fáilte Ireland in the sustainable development of these viewing points, and the identification of additional viewing locations along the route”.

All of the aforementioned scenic routes and views are part of the Wild Atlantic Way and are considered in this assessment.

10.4.7 Receptor Groups

The main receptor groups within the study area are as follows:

- Residents.
- Vehicle Users including Ferry Users; and
- Visitors.

10.4.7.1 Residential

Residential receptors will have a High sensitivity to visual changes as views will be experienced on a daily basis and therefore, even the smallest change in the landscape character or visual amenity will be noticed. Residences located within the Co. Kerry part of the study area are sparse and scattered across the area and along the local and regional roads. There are some clusters of dwellings in villages such as Tarbert and Glin. Long distance visibility from residences is often screened by vegetation or undulating topography. However, open views north towards the Shannon Estuary can be experienced from elevated locations and where intervening vegetation is low. The closest dwellings to the Proposed Development comprise a group of dwellings along the N67 and a minor road adjacent to SSE Tarbert within approximately 400m. Other residents are located in Tarbert along the N67, N69, and L1010 approximately 1.7km south at their closest.

Residences within Co. Clare follow a similar pattern as in Co. Kerry and are sparsely dispersed across the study area. Views across the Shannon Estuary are available from the Coast Road and from elevated locations along the N67, R846, and beyond.

Residences located in Co. Limerick and within the eastern most section of the study area concentrate also along the main roads such as the N69 and are otherwise scarcely scattered along local roads.

10.4.7.2 Vehicle Users including Ferry Users

Vehicle users along local, regional, and national roads within the study area include ferry passengers between Tarbert and Killimer. The sensitivity of vehicular / ferry users is usually considered Low as receptors often travel to get from one place to another with little attention for views. However, the study area contains a number of scenic roads, protected views and prospects, the Wild Atlantic Way touring route as well as panoramic views of the Shannon Estuary when crossing the Shannon. Users along

these routes are considered to have a Medium to High sensitivity. Vehicular traffic of residents of the local area around the Proposed Development, in particular where views are an important component on their way to or from home.

10.4.7.3 Visitors

The study area contains a number of scenic roads and protected views and prospects as well as the Wild Atlantic Way touring route. The visual amenity is part of the experience for visitors/ tourists travelling along these designated routes and will therefore have a High sensitivity to the quality of the components of the landscape character and visual amenity.

10.5 Potential Effects

The following potential direct and indirect landscape and visual effects arising from the Proposed Development, and their duration and nature, have been identified. The booklet of Photomontages submitted with the planning application (refer to EIAR Volume II Appendix 10A) illustrates the location of the Proposed Development from selected representative viewpoints within the study area.

10.5.1 Effects at Construction

Full details of the construction phase of the Proposed Development are presented in Chapter 5: Description of the Proposed Development. The construction phase will take place over a 29-month period.

Landscape and visual effects during the construction stage will be mainly experienced within the Site, in its vicinity as well as along the Shannon Estuary, its shores and adjoining elevated landscape areas along Counties Kerry, Clare and Limerick. Locations affected include open views of the Site, views across the Shannon Estuary, and views along the local road network where construction traffic will travel within Counties Kerry and Limerick. Construction activity will generally include the movement of machinery, equipment, and site workers. Cranes lifting materials and structures into position, and the temporary storage of materials within the Site.

10.5.1.1 Construction Phase – Landscape Effects

Construction effects on the landscape character resulting from the Proposed Development will be direct and indirect, mainly temporary, and result from the following:

- Loss of existing vegetation and habitat.
- Soil stripping, earthworks, grading.
- Effects of temporary to short-term site infrastructure such as site traffic, construction compounds, soil storage areas etc. especially those located in areas close to visual receptors.
- Physical effects arising from construction of the Proposed Development will be confined to the Site.

The receiving environment is identified as Landscape Character Area (LCA) 2 – The Shannon Estuary in the Kerry CDP and has a medium to high landscape sensitivity. Direct and long-term change will occur locally where the Proposed Development will be physically located. The magnitude of landscape change during construction is considered Low and the resulting significance/quality is **Slight / Adverse**.

Effects on the landscape character resulting from construction works will be temporary, short term and reversible. Construction will visually affect views at a local level. However, it will not alter the landscape character considering the existing industrial nature of the setting.

Outside of the Site, indirect effects of construction works will not result in the permanent loss of key features such as the overall landscape structure as the adjacent existing SSE Tarbert HFO Power Station is already a prominent and distinct industrial feature in the landscape character. Together with Moneypoint Power Station, located across the Shannon Estuary along the Co. Clare shoreline, it forms a significant industrial cluster in the estuarine environment. The magnitude of indirect landscape change during construction is considered low, within an area of medium to high landscape value with high sensitivity. The resulting landscape significance / quality will be **Slight / Neutral**.

10.5.1.2 Construction Phase – Seascape Effects

County Kerry has currently no Seascape Character Assessment. The County Kerry shores are captured by the Regional Seascape Character Assessment (RSCA), which includes onshore sections along the Shannon Estuary.

The Site is located within the following seascape character:

- Regional Seascape Character Type 2: Large Estuary
- Regional Seascape Character Area SCA8: Shannon Estuary and Tralee Bay

The Proposed Development is located onshore and will result in direct effects on the seascape character area and type during the construction phase. Construction works will be located adjacent to existing industrial character components (Tarbert HFO Power Station) of the Shannon Estuary and will intensify locally the industrial nature of the seascape character. Effects as a result from construction works on the seascape character are therefore considered medium and their significance / quality will be **Moderate / Adverse** within the Site.

Outside of the Site boundary, the seascape character of either designation will not alter due to the nature, scale and location of the Proposed Development and the associated construction works. The Proposed Development is only a small component in the overall size of the seascape character area and type. In the absence of a classification of the value and sensitivity of seascape character, and based on the descriptions provided in the RSCA, a medium value and high sensitivity rating has been applied to both designations. Effects as a result from construction works on the seascape character are therefore considered low and their significance / quality will be **Slight / Adverse** within approximately 4km radius from the Site boundary. Beyond 4km, the magnitude of seascape character effects will reduce to very low and their significance / quality to **Not Significant / Neutral**.

The seascape character areas (SCA) identified by Clare County Council, namely SCA 10 Lower Shannon and SCA 11 River Shannon are indirectly affected by construction works. Similar to the RSCA designations, the seascape character of SCA 10 & 11 will not alter due to the nature, scale and location of the Proposed Development and the associated construction works. The Proposed Development is located outside of these character areas. However, it is acknowledged that there is intervisibility between the Shannon Estuary shorelines and changes to the seascape character can affect either side. In the absence of a classification of the value and sensitivity of both seascape character areas and

based on the descriptions provided in the Seascape Character Area Assessment of County Clare, a medium value and high sensitivity rating has been applied to both designations. Effects as a result from construction works on the seascape character areas are therefore considered low and their significance / quality will be **Slight / Adverse** within approximately 4km radius from the Site boundary. Beyond 4km, the magnitude of seascape character effects will reduce to very low and their significance / quality to **Not Significant / Neutral**.

10.5.1.3 Construction Phase – Visual Effects

Visual effects during the construction stage will be experienced in the vicinity of the Site, from locations with open views of sections of the Proposed Development, including views across the Shannon Estuary from the Tarbert – Killimer Ferry, along locations of the northern shores and the associated elevated landscapes of County Clare as well as the southern shores towards Glin in Co. Limerick, west of the existing SSE Tarbert Power Station along the shores of Co. Kerry, and along the local road network where construction traffic will travel. Construction activity will not be visible to all of the visual receptors located within the study area due to intervening landform, vegetation and the distance from the Proposed Development. Construction works resulting in visual effects will include movement of machinery and equipment within the Site, scaffolding, cranes, other tall equipment, and construction traffic along the local road network.

Visual effects and their significance / quality at construction phase will cause a noticeable change in existing views over a wide area. The construction of the Proposed Development will slightly intensify the existing visual industrial character of the Site and will be most noticeable within close to middle distance views within approximately 4km distance from the boundary of the Site where open views along or across the estuary are available, particularly from elevated areas to the north along the R486, from the east along the local road through Lackyle and to the south-east, on elevated ground along the Glin loop Scenic Drive. The sensitivity of views ranges from high for residents to medium for vehicle users. The visibility of construction activities in these views will be **short term**. The magnitude of visual change will range from medium to low in short and middle-distance views. Their significance / quality will range from **Significant / Adverse to Slight / Neutral**.

Long distance discernible views will extend to a distance of up to approximately 5km at Glin Quay and up to 6km where views of the taller components will be glimpsed along the N67 coast road. At this distance, the scale of the Proposed Development will only occupy a small percentage of available open and panoramic views. The sensitivity of views ranges from high for residents to medium for vehicle users. The visibility of construction activities in these views will be **short term**. The magnitude of visual effects ranges from low to negligible and their significance / quality from **Slight / Neutral to Not Significant / Neutral**.

10.5.2 Effects at Operation

10.5.2.1 Landscape Effects

The following potential direct and indirect landscape effects arising from the Proposed Development have been identified, along with their duration and quality.

Direct and long-term change will occur locally where the Proposed Development will be physically located.

The receiving environment is identified as Landscape Character Area (LCA) 2 – The Shannon Estuary in the Kerry CDP and has a medium to high landscape sensitivity.

The Proposed Development will slightly intensify the existing industrial character of the Site but not alter the landscape character locally or in the wider study area due to its scale, nature, and location adjacent to the existing Tarbert HFO Power Station, which will remain the most prominent industrial feature along the southern shoreline of the Shannon Estuary.

It is anticipated that the development will introduce an additional industrial component to the existing industrial landscape character of the Site within approximately 4km radius from the SSE Tarbert Site. The magnitude of landscape change during operation is considered Low, within an area of medium to high landscape value with high sensitivity. The resulting significance / quality is **Not Significant / Neutral**.

10.5.2.2 Seascape Effects

Direct effects on the Regional Seascape Character Type 2: Large Estuary, and Regional Seascape Character Area SCA8: Shannon Estuary and Tralee Bay at operation are considered Low and their significance / quality will be **Slight / Adverse**. The Proposed Development will intensify the industrial character of SSE Tarbert.

Outside of the Site boundary, the seascape character of either RSCA designation will not alter due to the nature, scale and location of the Proposed Development. The Proposed Development is only a small component in the overall size of the seascape character area and type. Effects at operation are therefore considered low and their significance / quality will be **Slight / Neutral** within approximately 4km radius from the Site boundary. Beyond 4km, the magnitude of seascape character effects will reduce to very low and their significance / quality to **Not Significant / Neutral**.

The seascape character areas (SCA) identified by Clare County Council, namely SCA 10 Lower Shannon and SCA 11 River Shannon are indirectly affected by the Proposed Development at operation. Similar to the RSCA designations, the seascape character of SCA 10 and 11 will not alter due to the nature, scale and location of the Proposed Development. The Proposed Development is located outside of these character areas. However, it is acknowledged that there is intervisibility between the Shannon Estuary shorelines and changes to the seascape character can affect either side. Effects on the seascape at operation are considered low and their significance / quality will be **Slight / Neutral** within approximately 4km radius from the Site boundary. Beyond 4km, the magnitude of seascape character effects will reduce to very low and their significance / quality to **Not Significant / Neutral**.

Table 10.12: Summary of Landscape and Seascape Effects at Operation

Receptor	Landscape Value	Landscape Sensitivity	Magnitude of Landscape Change	Significance / Quality of Landscape Effects
Kerry (LCA) 2 – The Shannon Estuary	High	Medium / High	Low	Not Significant / Neutral
Clare LCA Shannon Estuary Farmland	High	High	Low	Not Significant / Neutral

Receptor	Landscape Value	Landscape Sensitivity	Magnitude of Landscape Change	Significance / Quality of Landscape Effects
Limerick LCA Shannon Coastal Zone	High	High	Low	Not Significant / Neutral
Seascape Character Area 'Lower Shannon'	Medium	High	Low	Slight / Adverse
Seascape Character Area 'River Shannon'	Medium	High	Low	Slight / Adverse
Regional Seascape Character Type: 2 – Large Estuary (direct - at site)	Medium	High	Low	Slight / Adverse
Regional Seascape Character Area: SCA 8 – Shannon Estuary and Tralee Bay (direct – at site)	Medium	High	Low	Slight / Adverse
Regional Seascape Character Type: 2 – Large Estuary (indirect - within 4km of the site boundary)	Medium	High	Low	Slight / Neutral
Regional Seascape Character Area: SCA 8 – Shannon Estuary and Tralee Bay (indirect - within 4km of the site boundary)	Medium	High	Low	Slight / Neutral

10.5.2.3 Visual Effects

The main visual receptor groups are residents, vehicle travellers including ferry / ship passengers, workers and visitors. Residents will have the highest sensitivity to change than road users or ferry passengers. Road users and workers will focus mainly on traffic or their commercial tasks and not primarily on available views. Ferry / ship passengers will see the Proposed Development in conjunction with the prominent existing Tarbert HFO Power Station and Moneypoint Power Station structures. Visitors will also have a high sensitivity to changes in views, however, different to residents, they do not experience these changes on a daily basis and may not know the difference between the current situation and the historic condition.

Visual effects will mainly relate to the introduction of a new large industrial facility onshore adjacent to the existing Tarbert HFO Power Station.

The immediate surrounding of the Site is sparsely populated. The closest residential dwellings in the immediate environment of the Proposed Development are located off the N67 and approximately 350m south of the Tarbert HFO Power Station.

The larger settlement of Tarbert further south along the N67 includes a number of residences along its road network. The majority of views from these residential properties will be screened by intervening topography and vegetation. The highest visual change will be noticeable along sections of the N67

within approximately 800m from the Site to the south as illustrated in Viewpoints / Photomontages 03 & 04, which are described in detail herein. Views from the remaining areas beyond 500-800 m within County Kerry will quickly become screened by intervening vegetation and topography and only the stacks of the existing Tarbert HFO Power Station will remain visible if at all.

Viewpoints / Photomontages 05, 06 & 07 illustrate views from within 4-6km from the Site boundary. Viewpoint / Photomontage 8 illustrates a middle-distance view to the southwest at approximately 4 km distance.

The Proposed Development will add an industrial facility adjacent to the prominent existing Tarbert HFO Power Station. It will be seen in all available views in conjunction with the more prominent Tarbert HFO Power Station. In that respect, and considering the zoning of the site for industry, the proposed development is not uncharacteristic in available views. However, it will intensify slightly the industrial character of estuarine views. It will create a new point of focus in available close distance views (within approximately 1km of the Site). The significance / quality of visual effects is considered to range from slight / neutral to moderate / adverse depending on the openness of the view and the extent of intervening topography and existing vegetation. Some close distance views are fully screened by intervening topography, vegetation, and the existing Tarbert HFO Power Station. Considering the location and the middle to long distance nature of views within 1 – 8km from the Site boundary, visibility will also depend on weather conditions and the level of haziness.

The majority of open views of the Proposed Development will be experienced from the Co. Clare side of the Shannon Estuary, where middle to long distance open views of the Proposed Development will be possible. This includes most coastal roads within the study area as well as elevated sections of the N67 and R486 and adjoining local roads, refer to Viewpoints / Photomontages 01, 09 - 13. Visibility is generally considered middle to long distance in nature (beyond 1km) due to the width of the estuary. Despite the distance, the Proposed Development will be discernible, but it will not become a new focus point or landmark as the existing Tarbert HFO Power Station will remain dominant in views from the shoreline. The Proposed Development will be a new component in often panoramic views across the estuary into Co. Kerry. It will be seen in conjunction with existing wind turbines including Leanamore Wind Farm and Tullahennel Wind Farm in Co. Kerry and Money Point Power Station and its chimney stacks in Co. Clare. Similar as for views in County Kerry, existing views contain already large scale industrial or light industrial developments, and the Proposed Development will therefore not be out of character. Visual effects are considered to range from very low to low and the significance / quality from Imperceptible / Neutral to Slight / Neutral depending on the distance and panoramic nature of the views.

Photomontages submitted with this planning application (refer to EIAR Volume II, Appendix 10A) illustrate the location of the Proposed Development in views from various directions and at different distances. A detailed description of each viewpoint (as mapped in EIAR Volume III, Figure 10.1) is included herein and should be read in conjunction with the photomontage booklet, submitted with this planning application.

Viewpoint 01 – Killimer Ferry Terminal, Co. Clare

Existing View This viewpoint is located at Killimer Ferry Terminal, approximately 2.85km north of the Site. This location is representative of the view experienced by ferry passengers, commuters, tourists and day trippers and forms part of the Wild Atlantic Way route. In the foreground the Kilmer ferry pier extends into the waters of the Shannon Estuary, a busy shipping channel. The buildings and other components of the existing SSE Tarbert site are prominent in this view, the two emissions stacks are the tallest elements in the landscape, breaking the horizon of the hillside. To the southeast (towards Limerick) the topography rises gently and comprises of a rural landscape in agricultural use. To the west, (right of this image) the land holding, and Site boundary extend along the Kerry shoreline and has an intensely industrial appearance. The landscape in the far distance is generally low lying and has a rural landscape character. The Tarbert Lighthouse and a section of the Tarbert ferry pier are also visible to the left of the Site.

The value of this view is considered Medium. The sensitivity is considered Medium, and the visual receptors are vehicle users and ferry passengers with a Medium susceptibility to change.

Predicted View The Site is part of the larger SSE Tarbert site and, from this viewpoint, fronts the Site along the estuary shoreline and wraps around the west side of the existing power station structures. The proposed Denim Water Tanks and storage Dry and Bulk Tanks are located in the north of the Site, closest to the viewer. The proposed façade treatment and the colours of tanks consist of a palette of four main colours selected from the surrounding environment which range within a muted light grey and green spectrum which will help the integration of the built structures into the surrounding landscape.

The magnitude of visual change to the view is considered **Low**. The Proposed Development does not alter the existing character or impair the visual amenity of the existing composition. The Proposed Development will be clearly visible and intensify the existing industrial nature of the Site but will not introduce any elements uncharacteristic to the view. The visual significance and quality will be **Slight** and **Neutral**.

Viewpoint 02 – Shannon Estuary (from Tarbert – Killimer ferry)

Existing View This viewpoint is taken from the ferry deck crossing the Shannon Estuary as it approaches Tarbert pier. The existing Tarbert HFO Power Station is the most prominent feature in this view. The Site wraps around the west side of the existing buildings. The viewpoint (while transient) permits an open view across the estuary from mid-distance. The Site has an intensely industrial character with limited vegetation or available screening. The low-lying landscape to the west is punctuated with electricity pylons servicing overhead powerlines running in a northeast to southwest alignment. The relatively low-lying nature of the surrounding rural landscape is apparent.

The value of this view is considered Medium. The visual receptors are ferry passengers and users of other marine vessels traversing a similar route along the estuary channel. The sensitivity and susceptibility to change is considered Medium.

Predicted View The Photomontage illustrates the components of the proposal fronting the shoreline including the cluster of storage tanks, and west of the existing power station the block form of the OCGT

turbine housing and the OCGT emissions stack are prominent features on the landscape intensify the existing industrial nature of the view.

The magnitude of visual change to the site is considered **Low**. The Proposed Development does not alter the existing character or impair the visual amenity of the existing composition. Clearly visible, the Proposed Development will intensify the existing industrial nature of the Site but will not introduce any elements uncharacteristic to the view or become a dominant new feature. The visual significance / quality will be **Slight / Neutral**.

Viewpoint 03 – Site Access point– N67

Existing View This viewpoint is representative of views north along the N67 leading to the Tarbert Ferry pier. The steel gates located at the centre of this image is the access point to SSE Tarbert. The character of the view has an overall rural nature with a prominent industrial element. The existing power station and parts of the existing electrical substation protrude above the vegetation in the foreground. The lands to the south of the Site include areas of visual amenity and are considered a 'visually sensitive area'. Views & Prospects from the N67 / coast road on the eastern side of SSE Tarbert site, facing east and north afford open vistas across the Shannon Estuary and are orientated away from the Proposed Development. The N67 forms part of the Wild Atlantic Way touring route.

Sensitive visual receptors include vehicle users. The value of this view is considered Medium. The sensitivity is considered Medium and susceptibility to change is considered Low.

Predicted View The Photomontage illustrates the proposed built form in a wireline image - outlining where the Proposed Development will be located on the Site. The proposal is largely screened from view by the intervening-built structures, topography and existing vegetation. A section of the OCGT structure, similar in scale and form to the existing buildings will become part of the larger built environment, intensifying the industrial character of the composition.

The magnitude of visual change to the Site is considered **Low**. The Proposed Development does not alter the existing character or impair the visual amenity of the existing composition. The Proposed Development will intensify the existing industrial nature of the Site but will not introduce any elements uncharacteristic to the view. The visual significance and quality will be **Not Significant** and **Neutral**.

Viewpoint 04 – N67 – Visually Sensitive Area

Existing View This viewpoint is located along the N67, a busy national route serving the Tarbert ferry terminal south of the Site. This viewpoint is located in a 'visually sensitive area' in the Kerry CDP where designated views orientate east of the open waters of the estuary. This viewpoint orientates north towards the Site and permits an open vista of existing Tarbert HFO Power Station and captures a section of the Tarbert pier across the waters of Tarbert Bay. The existing Tarbert HFO Power Station, the electrical components of the substation to the west and the two tall chimney stacks are dominant features in this view. Treelines and hedgerows front the N67. The Power station is a landmark in this view from this distance where becomes quickly apparent as the observer travels along the N67 towards Tarbert pier.

Visual receptors of this view include vehicle users. The value of this view is considered Medium. The sensitivity is considered High and susceptibility to change is considered Medium.

Predicted View A section of the OCGT structure, similar in scale and form to the existing buildings will become part of the larger built environment - lengthening the nautical themed built form of the existing power plant and slightly intensifying the industrial character is the composition. The proposed 55m emissions stack protrudes above the existing power station, the colour palette chosen from the surrounding environment allows the Proposed Development to assimilate into its setting.

The magnitude of visual change to the Site is considered **Low**. The Proposed Development does not alter the existing character or impair the visual amenity of the existing composition. The Proposed Development will intensify the existing industrial nature of the Site but will not introduce any elements uncharacteristic to the view. The visual significance and quality will be **Slight** and **Neutral**.

Viewpoint 05 – Scenic route loop to Glin, Co. Limerick

Existing View This viewpoint is located approximately 4.8 km south from the Site on higher ground at the crossroads of the L1233. The L1233 is a designated scenic route in the Limerick CDP forming a loop with the N69 affording several vantage points across the estuary along this stretch of road. The viewpoint permits panoramic views across the landscape towards Tarbert Bay, the Shannon Estuary, and the southern shores of Co. Clare.

The foreground is rural in nature comprised of small fields in agricultural use and bound with native hedgerows and hedgerow trees. There are a number of residential dwellings in this area on single plots, some are screened from view by vegetation. The Shannon Estuary is frequently used for leisure boating and is also an active shipping corridor. The Tarbert HFO Power Station is a prominent feature in this panoramic view in the mid distance. Together with the existing Moneypoint Power Station and Wind Farm, it forms a significant industrial cluster along the shores of the Shannon Estuary.

The value of this view is considered High. Sensitive receptors in this area include vehicle users and residents. The sensitivity is High and susceptibility to change is considered Medium.

Predicted View The Proposed storage tanks are located north of the existing power station and are not visible from this location. The proposed OCGT structure protrudes slightly above and to the west of the existing power station buttressing the built form. The OCGT stack is not visible from this location.

The magnitude of visual change to the Site is considered **Low**. The Proposed Development does not alter the existing character or impair the visual amenity of the existing composition. The Proposed Development will intensify slightly the existing industrial nature of the Tarbert HFO Power Station complex but will not introduce any elements uncharacteristic to the view. The visual significance and quality will be **Not Significant** and **Neutral**.

Viewpoint 06 – Scenic route loop to Glin, Co. Limerick - Night-time conditions

Existing View: As described for Viewpoint 05 above. This image was captured at twilight to explore any impact on visual amenity of the area under night sky conditions. This view is located on higher ground

at the crossroads of the L1233 crossroads and permits an open view of the night sky, the reflection of light on the water and some lighting conditions in the area. Existing lighting includes a number of streetlights along the N69 towards Tarbert Village, the white lights and the red stack lights on the Tarbert HFO Power Station, various lights at Moneypoint Power Station and red aviation lights on the wind turbines of Moneypoint Wind Farm. Other lit up areas include the Killimer Ferry Terminal across the Shannon Estuary and a number of other light points scattered across the County Clare countryside in the distance.

The value of this view is considered High. Sensitive receptors in this area include vehicle users and residents. The sensitivity is High and susceptibility to change is considered Medium.

Predicted View The Proposed Development is barely discernible from this location under night-time conditions. The lighting of the Proposed Development will not be discernible from this location resulting in **no visual effects**.

Viewpoint 07 – Glin shoreline, Co. Limerick

Existing View The viewpoint was captured from the shoreline at Glin approximately 5.6km east the Site. The viewpoint is located adjacent to the N69, a designated scenic route in the Limerick CDP. The view across Glin Quay affords an open vista across the Shannon Estuary. Tarbert HFO Power Station and Moneypoint Power Station appear both at the centre of the image in the background. The mouth of the estuary between them is almost imperceptible. The gently undulating and low topography along either side of the Shannon Estuary in Co. Kerry and Co. Clare form the horizon.

The value of this view is considered High. Visual receptors include the local community and vehicle users. The sensitivity is considered High and susceptibility to change is considered Medium.

Predicted View The introduction of the Proposed Development to the Site is barely discernible, a slight intensification of build form will become recognisable north of the existing Tarbert HFO Power Station.

The magnitude of visual change in this view is considered **Low**. The Proposed Development does not alter the existing character or impair the visual amenity of the existing composition. The Proposed Development will visually integrate into the existing industrial complex at Tarbert HFO Power Station and, in this view, also with the industrial components of Moneypoint Power Station. The Proposed Development will not introduce any elements uncharacteristic to the view. The visual significance and quality will be **Not Significant** and **Neutral**.

Viewpoint 08 – Lackyle, Co. Clare

Existing View This viewpoint is located in Lackyle, a small headland along the County Clare shoreline, approximately 3.9km north-east of the Site. The unnamed road has a northeast to southwest alignment permitting an open view of the estuary and a direct view towards the Site in the mid distance. A number of residential dwellings and local overhead distribution lines are located along this road, including several vernacular style cottages fronting the road in a broadly north - south orientation. Lands west of this road and a section of lands close to the shoreline are designated as Heritage Landscapes in the Clare CPD.

The value of this view is considered Medium. The visual receptors include residents and vehicle users. The sensitivity is considered High and susceptibility to change is considered Medium.

Predicted View The photomontage illustrates the components of the proposal fronting the shoreline including the cluster of storage tanks, and west of the existing power station - the block form of the OCGT turbine housing and the OCGT emissions stack are also discernible leading to a slight intensification of the existing industrial elements within this view.

The magnitude of landscape change to the Site is considered **Low**. The Proposed Development does not alter the existing character or impair the visual amenity of the existing composition. The Proposed Development will slightly intensify the existing industrial nature of the Site but will not introduce any elements uncharacteristic to the view. The visual significance and quality will be **Slight** and **Neutral**.

Viewpoint 09 – Knock Pier, Co. Clare

Existing View This viewpoint is located at Knock Pier, Co. Clare, adjacent to the R486 regional road approximately 4.7km from the Site. The pier has open views across Clonderalaw Bay and towards the prominent existing Tarbert HFO Power Station. The gently rolling landscape Kerry and Limerick landscape across the estuary is rural in character. However, existing overhead transmission line towers and wind turbines are prominent features on the ridgeline (Co. Kerry) in the background.

The value of this view is considered High. The visual receptors are the local community and boat users at the pier. The sensitivity is considered High and susceptibility to change is considered Medium.

Predicted View The Proposed development site wraps around the west side of the existing power station structures. The photomontage illustrates the components of the Proposed Development fronting the shoreline including the cluster of storage tanks, the muted colour palette integrates the built form into the landscape. The nature of the view will remain largely similar, the block form of the OCGT turbine plant and the OCGT emissions stack are discernible features on the landscape slightly intensifying the existing industrial site conditions.

The magnitude of visual change to the Site is considered **Low**. The Proposed Development does not alter the existing character or impair the visual amenity of the existing composition. The Proposed Development will slightly intensify the existing industrial nature of the Site but will not introduce any elements uncharacteristic to the view. The visual significance and quality will be **Slight** and **Neutral**.

Viewpoint 10 – R486, Co. Clare

Existing View This viewpoint is located along a stretch of R486 at Burrane on the northern shore of the Estuary in County Clare. This elevated viewpoint is located approximately 3km from the Site and approximately 550m east Killimer Ferry Terminal. A number of residential dwellings are located along this section of the road and tend to have a broadly north south orientation. The southern shoreline of Shannon Estuary is a designated as Heritage Landscape in the Clare CDP. This section of road has a low hedgerow boundary permitting open views towards the estuary and the Site. To the west, the white tanks at SSE Tarbert owned by the National Oil Reserve Agency stand out against the rolling vegetation of the backdrop.

The value of this view is considered High. There sensitive receptors in this area are adjacent residential dwellings and vehicle users along the R486. The sensitivity is High and susceptibility to change is considered Medium.

Predicted View The Proposed storage tanks are located north of the existing power station and screen some of the existing building parts of Tarbert HFO Power Station. The proposed OCGT structure protrudes to the west of the existing power station buttressing the built form. The OCGT stack is visible from this location.

The magnitude of visual change to the Site is considered **Low**. The Proposed Development does not alter the existing character or impair the visual amenity of the existing composition. The Proposed Development will intensify the existing industrial nature of the Site but will not introduce any elements uncharacteristic to the view. The visual significance and quality will be **Slight** and **Neutral**.

Viewpoint 11 – R486, Co. Clare – Night-time conditions

Existing View As described for Viewpoint 10 above. This image was captured at twilight to explore any impact on visual amenity of the area under night sky conditions. The low hedgerow permits an open view of the Site under night sky conditions. The existing lighting of Tarbert HFO Power Station as well as the associated amber jetty lights and the aviation warning lights at the SSE stacks are discernible.

The value of this view is considered High. There sensitive receptors in this area are adjacent residential dwellings and vehicle users along the R486. The sensitivity is High and susceptibility to change is considered Medium.

Predicted View The Proposed Development will screen sections of the existing Tarbert HFO Power Station and reduce the overall recognisable lighting. New lights attached to proposed storage tanks will be discernible. The magnitude of visual change to the Site is considered **Low**. The Proposed Development will reduce the overall visible lighting from this viewpoint. The visual significance and quality will be **Slight** and **Beneficial**.

Viewpoint 12 – Coast Road N67, Co. Clare

Existing View This viewpoint is located Ballymacrinay along the N67 coast road, approximately 8km from the Site. This section of the coast road is designated a Scenic Route in the Clare CDP and form's part of the Wild Atlantic Way. The view across Ballymacrinan Bay and the headland at Moneypoint affords open mid distance view across the landscape where the existing Tarbert HFO Power Station structures and chimneys stacks can be glimpsed protruding above the mid horizon [next to the yellow gantry]. Moneypoint Power Station and Moneypoint Wind Farm are the prominent features in the middle ground, partially screening Tarbert HFO Power Station located in the background.

The value of this view is considered High. Sensitive receptors include vehicle users and residents. The sensitivity is High and susceptibility to change is considered Medium.

Predicted View The introduction of the Proposed Development to the Site is barely discernible, a slight intensification of build form may be detected on a clear day.

The magnitude of visual change is considered **Very Low**. The Proposed Development does not alter the visual amenity or add prominent industrial features to the view. The significance and quality of visual effects will be **Imperceptible** and **Neutral**.

Existing View **Viewpoint 13 – Cappa Pier, Co. Clare**

This viewpoint was captured on Cappa Pier at Cappa Village southwest of Kilrush, Co. Clare approximately 9.6km from the Site. Cappa Pier is located adjacent to the Wild Atlantic Way driving route and a designated Scenic Route in the Clare CDP. The intervening landscape and rugged shoreline are designated Heritage Landscape by the Clare CDP. The shoreline includes manmade retaining walls, streetlights and a number of residences along the Coast Road in the middle ground as well as a raised headland. The tallest built elements in this view are the stacks of Moneypoint Power Station, and a number of turbines associated with Money Point Wind Farm, which protrude above the vegetation in the middle distance.

The value of this view is considered High. Sensitive receptors include the local community and boat users at the pier. The sensitivity is High and susceptibility to change is considered High.

Predicted View The Proposed Development will not be visible from this location resulting in **no visual effects**.

Viewpoint 14 – Carrigafoyle Castle, Co. Kerry

Existing View This viewpoint is captured through a window on the upper floors of Carrigafoyle Castle, approximately 8km west from the Site. The castle is located on an island in an inter-tidal zone of Ballylongford Bay and was built in the late 15th, early 16th century. The Historic Environment Viewer (2023) describes it as: *“a single tower of five storeys which rises to a height of over 24.4m and is constructed of small stones neatly laid”*. The castle is a Discovery Point on the Wild Atlantic Way route and falls within a VSA envelope of protected views east of the L6010 Local Road in the Kerry CDP. This location affords open distant vistas across the Shannon Estuary including Moneypoint Power Station and wind farm as well as the surrounding low-lying landscape towards the Site. The two existing tall chimneys stacks on the SSE Tarbert site protrude slightly above the land mass in the distance.

The value of this view is considered High. Sensitive receptors are visitors to the castle. The sensitivity is High and susceptibility to change is considered High.

Predicted View The Proposed Development will not be visible from this location resulting in **no visual effects**.

A summary of visual effects is provided in Table 10.13.

Table 10.13: Summary of Visual Effects at operation

Viewpoint	Receptor Groups	Visual Susceptibility	Visual Sensitivity	Magnitude of Visual Change	Significance / Quality of Visual Effects
Viewpoint 1	Vehicle users, Ferry Passengers	Medium	High	Low	Slight Neutral
Viewpoint 2	Ferry Passengers, Other users of marine vessels	Medium	Medium	Low	Slight Neutral
Viewpoint 3	Vehicle users	Low	Medium	Low	Not significant Neutral
Viewpoint 4	Vehicle users	Medium	High	Low	Slight Neutral
Viewpoint 5	Residents, Vehicle users	Medium	High	Low	Not significant Neutral
Viewpoint 6 (Night-Time)	Residents, Vehicle users	Medium	High	None	None
Viewpoint 7	Local community, Vehicle users	Medium	High	Low	Not significant Neutral
Viewpoint 8	Residents, Vehicle users	Medium	High	Low	Slight Neutral
Viewpoint 9	Local community, Boat users	Medium	High	Low	Slight Neutral
Viewpoint 10	Residents, Vehicle users	Medium	High	Low	Slight Neutral
Viewpoint 11 (Night-Time)	Residents, Vehicle users	Medium	High	Low	Slight Beneficial
Viewpoint 12	Residents, Vehicle users	Medium	High	Very Low	Imperceptible Neutral
Viewpoint 13	Local community, Boat users	High	High	None	None
Viewpoint 14	Visitors	High	High	None	None

10.5.2.4 Effects on Scenic Routes / View & Prospects

Visual effects on scenic routes / views & prospects were examined during a site visit of the study area in June 2023 by the author of this chapter. A summary of visual effects on designated scenic routes is provided in Table 10.14. Further details on the effects on scenic routes / views & prospects are included in the relevant individual photomontage descriptions in Section 10.5.2.3.

Table 10.14: Summary of Visual Effects on Scenic Routes

Viewpoint / Photomontage	Scenic Route	Visual Susceptibility	Visual Sensitivity	Magnitude of Visual Effects	Significance / Quality of Visual Effects
Photomontage 01 (County Clare)	Wild Atlantic Way	Medium	High	Low	Slight Neutral
Photomontage 03 (County Kerry)	Views east and southeast of Tarbert Bay along the N69. Section of Wild Atlantic Way.	Low	Medium	Low	Not significant Neutral
Photomontage 04 (County Kerry)	Views east and southeast of Tarbert Bay along the N69. Section of Wild Atlantic Way.	Medium	High	Low	Slight Neutral
Photomontage 05 (County Limerick)	Shannon estuary from Foynes to Glin	Medium	High	Low	Not significant Neutral
Photomontage 06 (County Limerick)	Shannon estuary from Foynes to Glin	Medium	High	None	None
Photomontage 07 (County Limerick)	Shannon estuary from Foynes to Glin	Medium	High	Low	Not significant Neutral
Photomontage 12 (County Clare)	Coast road southeast of Cappagh to Carrowdotia South. Section of Wild Atlantic Way.	Medium	High	Very Low	Imperceptible Neutral
Photomontage 13 (County Clare)	Coast road southeast of Cappagh to Carrowdotia South. Section of Wild Atlantic Way.	High	High	None	None
None	Estuarine views east and northeast along sections of the L6010 towards Carrigafoyle Castle north of Ballylongford. Section of Wild Atlantic Way.	High	High	None	None
None	Views west of Lislaughtin Abbey from a short section of the L1010 northeast of Ballylongford. Section of Wild Atlantic Way.	High	High	None	None

10.5.2.5 Lighting Effects

Photomontages 6 and 11 illustrate the Proposed Development at night-time. Visual effects have been described in Section 10.5.2 and are summarised in Table 10.13.

External lighting is proposed throughout the Site. It is proposed that lighting will not be required during night-time except in circumstances where access is required, which cannot be delayed until daytime.

10.5.3 Cumulative Effects

In addition to landscape and visual effects, it is also important to consider cumulative landscape and visual effects. Significant cumulative effects may occur where a number of similar developments

combine to increase the prevalence of that type of development within a landscape or view to the extent that they become a defining characteristic. In order to ensure a reasonable and proportionate cumulative assessment, only developments that are considered to be similar in scale, type and nature to the Proposed Development have been considered in the assessment of cumulative effects within this report. The assessment of cumulative effects is based on a scenario which assumes that all other identified developments of similar nature have been constructed. The cumulative assessment evaluates the additional change resulting from the Proposed Development in relation to the theoretical baseline scenario and follows a same methodology to that used for the landscape and visual assessments.

There is the potential for cumulative effects to occur in combination with other sources in the study area.

A desktop planning history search using the Kerry County Council (KCC), Limerick County Council (LCC), Clare County Council (CCC), and ABP Online Planning Systems noted a number of relevant planning applications located within Co. Kerry, which could combine with the Proposed Development to create a cumulative impact on landscape assets and visual amenity.

A list of relevant cumulative developments considered which potentially result in cumulative landscape and visual effects is included in Table 10.15 including a summary of cumulative effects. Cumulative effects are described in further detail herein.

Table 10.15: Summary of relevant cumulative developments

Kerry County Council / An Bord Pleanála (ABP) Planning Ref. No.	Applicant Details	Location	Grant / Due Date	Cumulative Effects / Quality of Effects
23350	EirGrid Plc.	SSE Tarbert Site	Not Determined yet (Decision Due Date 07/12/2023)	Slight / Neutral
ABP-315838-22	EirGrid Plc.	SSE Tarbert Site	Further Information Requested	Moderate / Adverse
18392	SSE Renewables (Ireland) Limited	SSE Tarbert Site	Granted Conditional 15/01/2019	Slight / Adverse
18878	Shannon Clean Tech Ltd	Battery energy storage system (BESS) facility	Granted Conditional 23/09/2019	Not Significant / Neutral
19115	Glencloosagh Energy Limited	Grid stabilisation facility	Granted Conditional 25/10/2019	Not Significant / Neutral
20850	Kilpadouge Green Energy Ltd	Peaker Power Plant	Conditional 12/11/2020	Not Significant / Neutral
21549	Donal Murphy Glencloosagh Energy Limited	Inertia synchronous compensator (HISC) compound	Granted Conditional 19/07/21	Not Significant / Neutral
18520	ESB	Battery energy storage system	Granted Conditional 24/07/2018	Imperceptible / Neutral

Kerry County Council / An Bord Pleanála (ABP)
Planning Ref. No.

Applicant Details

Location

Grant / Due Date

Cumulative Effects / Quality of Effects

		(BESS) facility close to Moneypoint Power Station		
19746	ESB	300 to 400 MVA (electrical rating) synchronous condenser within Moneypoint Power Station	Granted Conditional 20/11/2019	Imperceptible / Neutral

Planning Application 23350: Works to the Tarbert substation compound and 220kV underground cabling. This application is located within the Site occupying 6.9ha and is located directly adjacent to the Proposed Development. Planning determination has not been issued yet and further information has been submitted by the applicant to An Bord Pleanála.

There is a likelihood that construction works associated with Application 23350 could coincide with the construction of the Proposed Development creating cumulative effects resulting from additional construction machinery on the Site and adjacent roads where construction traffic will travel. The proposed underground cabling will route will traverse the SSE Tarbert site. No specific landscape mitigation has been proposed for this development. Cumulative landscape and visual effects at construction are considered low and temporary. The significance and quality of cumulative effects is considered **Slight and Neutral**.

Planning Application ABP-315838-22: Development of Temporary Emergency Generation (TEG) located approximately 170m to the south-west of the Proposed Development. It will comprise three open cycle gas turbine units including 30m flue gas stacks (and balance of plant); liquid fuel storage and offloading facility; connection equipment; and connection to the existing electrical substation. The TEG will be nearing completion and approaching commissioning by the time the construction starts on the Proposed Development (subject to the grant of planning consent) so there will be limited cumulative impact from construction activities on site. It is considered likely that the three 30m flue gas stacks will be visible 'in combination' with the Proposed Development and cumulative visual effects will likely be experienced on the visual amenity in the study area.

The TEG will remain in place with an approximate two or three-year operational overlap with the Proposed Development depending on when planning permission for the Proposed Development is granted and construction commences. The three 30m flue gas stacks will combine with the 55m high emissions stack of the Proposed Development will intensify the industrial character of the built environment. The TEG is a temporary project which will be removed after 2028 when any cumulative impact will cease. When visible in combination, cumulative landscape and visual effects are considered medium as both developments reinforce the industrial character and industrial visible elements in

available open views across the Shannon Estuary. The significance and quality of temporary cumulative effects is considered to be **Moderate and Adverse**.

Planning Application 18392: Construction of a Battery Storage facility with a total site area of up to 2.2278ha, to include 50 no. self-contained battery container units with associated HVAC cooling units, 13 converter and 13 step up transformer container units, associated compound cabling and ducting, a grid transformer, a single storey substation / control building with welfare facilities, a cable route grid connection to the existing ESB substation building, maintenance lighting, security fencing, a CCTV monitoring system, and all associated ancillary infrastructure on lands within the Tarbert generating facility.

A ten-year planning permission is being sought to construct this development so there is the potential that construction of the battery storage facility could coincide with the construction of the Proposed Development resulting in temporary cumulative effects during the construction phase on the landscape character as well as on the visual amenity from combined construction traffic activities. No specific mitigation measures have been proposed. Temporary cumulative landscape and visual effects will be low. The significance and quality is considered **Slight and Adverse**.

Planning Applications 18878, 19115, 20850 and 21549: These four applications relate to various elements of an electricity power generator at the Peaker Plant and battery energy storage system facility on a site 1.8km to the south-west of the Proposed Development. Elements of this development have already been constructed and are located on a site on higher ground. Given the distance between these two developments, which includes intervening mature vegetation associated with Tarbert Demesne (NIAH 2051), it is unlikely that construction will be intervisible or combine to create cumulative effects on the landscape assets or visual amenity. The magnitude of temporary cumulative effects are considered very low, and their significance and quality is considered **Not Significant and Neutral**.

The remaining two applications relate to Moneypoint Power Station which is located on the northern shore of the Shannon Estuary within County Clare. They are located approximately 4km to the north-west of the Proposed Development.

Planning Application 18520: 7.5MW capacity battery storage facility within a secured compound, on a 0.4ha site. Considering the distance between this application and the Proposed Development on a site with existing electrical infrastructure, it is unlikely there will be any cumulative impact because it is not likely that construction activities will combine to create cumulative effects on the landscape assets or visual amenity within the study area. The magnitude of cumulative landscape and visual effects is very low. The significance and quality of cumulative effects is considered **Imperceptible and Neutral**.

Planning Application 19746: Construction of a 300 to 400 MVA (electrical rating) synchronous condenser which will be situated in a 1.8ha site. Considering the distance between this application and the Proposed Development on a site with existing electrical infrastructure, it is unlikely there will be any cumulative impact as it is not likely that construction activities will combine to create cumulative effects on the landscape assets or visual amenity within the study area. The magnitude of cumulative landscape and visual effects is very low. The significance and quality of cumulative effects is considered **Imperceptible and Neutral**.

10.5.4 Effects during Decommissioning

Effects arising from the process of decommissioning of the Proposed Development are considered to be of a similar nature and duration to those arising during the construction process as described in **Section 10.5.1**. Where this assessment refers to potential construction effects, these are also representative of predicted decommissioning effects. Further details on the process of decommissioning is included in Volume I, Chapter 5: Description of the Proposed Development.

10.6 Mitigation Measures

Mitigation is a term used to describe the measures that are employed to address environmental effects. The purpose of mitigation is to avoid, reduce and where possible remedy or offset, any significant adverse direct and indirect effects on the environment arising from the Proposed Development.

Embedded mitigation measures form an integral, committed, and deliverable part of the Proposed Development design or comprise standard construction practices. They are assumed to be implemented and are therefore factored into the determination of residual significant effects. The following embedded mitigation measures have been identified.

The Proposed Development has been designed, as far as practicable, to avoid adverse effects on the landscape and views through consideration of options, appraisal, and refinement. Modifications made to the design of the Proposed Development to avoid and reduce effects include mainly limiting the footprint of the Proposed Development, siting of components, and, where possible, minimise impacts on established vegetation and features that contribute to landscape character and visual amenity. Considering the location and nature of the Site adjacent to the existing Tarbert HFO Power Station and along the shore edge of the Shannon Estuary, landscape planting measures are not proposed as they will not be effective in providing additional screening for the Proposed Development.

Facade Colour Scheme

The Proposed Development is located in a prominent setting close to the N67 with a low-lying landscape as a backdrop, particularly when seen from the County Clare side. The principal visual mitigation measures for the Overall Proposed Development is therefore inherent in the design of its architecture and its colour scheme.

With the primary objective to minimise the visual impact of the built structures and to allow the buildings to be as unobtrusive as feasible against their backdrop, the proposed colour scheme was drawn from colours found in the surrounding local landscape.

The building colours consist generally of a mix between the following four main colours, which range all within a muted light grey and green spectrum.



The colours pick up existing colours of the landscape across the estuary landscape and its hinterland against which the Proposed Development built structures will be seen in the majority of views. The proposed colour scheme will help to take the attention away from individual buildings and roofscapes and help blending-in the proposed built structures better with the landscape in available views from local residences, the public road network, including (elevated) scenic routes and from the estuary itself.

Sections of Proposed Development will still become a new focus point in a number of available views, particularly the storage tanks along the shoreline as well as the taller elements of the proposal. The implementation of the proposed colour scheme will help to take the attention away from the Proposed Development and make it one of several other existing industrial facilities across available views rather than pinpointing it with bright colours, which will otherwise emphasise further the existence of the proposed industrial structures in available views. The colours will also work with varying weather and visibility conditions, where their muted colours can quickly blend in.

A similar colour scheme has been applied to the constructed ESB substation near Kilmorna, Co. Kerry, which successfully helped the integration of the built structures into the surrounding landscape in close and distant views including designated scenic views across the River Feale valley.

Similar muted colours have also been applied to new or refurbished oil tanks on Whiddy Island helping to integrate these structures in available views. While the tanks cannot be missed, their colour helps to avoid making them stand out. The capping of some of the tanks was not changed in colour and left in a light grey which keeps drawing the attention of the viewer. This emphasises the need of muted colours not just on facades but also on roof structures.

Lighting

Although not required to reduce any significant adverse effects, the following mitigation measures will be implemented as part of good lighting design practice:

- All proposed luminaires in the lighting design strategy are approved International Dark Sky Association (IDA) luminaires; any other exterior lighting will follow this principle.
- Utilise back shields, glare cowls, louvres and similar to minimize / obscure source intensity towards the adjacent hedges and nearby residences; use reflector types that redirect light back downward to desired work areas.
- Confine lighting to the task area (use horizontal cut-off optics and zero tilt angles, particularly for floodlights).

- Give careful consideration to luminaire positioning and orientation; all floodlight luminaires to be oriented downward or at very low angles to provide lighting only to the areas directly below and adjacent to a given pole.
- Ensure low colour temperature lamps (CCT) ≤ 3000 K are in use where possible; and
- Maximise times where lighting can be shut off or dimmed.

10.7 Residual Effects

Effective implementation of the proposed embedded mitigation measures, as described in Section 10.6, will have a beneficial impact and help to minimise landscape and visual effects associated with the Proposed Development. Sensitive design and colouring of the proposed building structures as proposed above will help integrating the Proposed Development into the surrounding environment.

Given the nature of the Site, the scale and location of the Proposed Development, the mitigation measures focus on architectural mitigation and minimising lighting during night-time. These measures will be implemented immediately and come into effect following the completion of construction works.

The majority of visible built structures in available views will remain as at the time of the completion of construction works (façade design and colour scheme, lighting design). The proposed colour scheme will help integrating the Proposed Development in available views. The magnitude and significance of landscape, seascape and visual effects during the operational phase will therefore remain the same as described in Section 10.5.

10.7.1 Decommissioning Phase

As outlined in Chapter 5 Description of the Proposed Development, measures will be undertaken by the Applicant during decommissioning to ensure that there will be **No Significant, Adverse** environmental effects from the removal of built structures. General mitigation measures that will be implemented are outlined in Volume I, Chapter 5. As a result, additional potential impacts and associated effects arising during the decommissioning phase are not anticipated above and beyond those already assessed during the construction phase.

10.8 Do Nothing Scenario

All components of the environment are constantly changing due to a combination of natural and human processes. When predicting likely direct and indirect effects it is important to remember that there are two available for comparison: the existing environment, i.e., the baseline as described in Section 10.4, and the environment as it will be in the future if no development of any kind were to take place – the ‘do nothing’ impact.

In landscape terms, if the Proposed Development did not go ahead, the character of the Site will remain an industrial brownfield site with areas of scrub. The significance will be **Imperceptible** and **Neutral**.

In visual terms, the industrial components in available views will remain similar without significant changes to the visual amenity. Likely changes will relate to changes to the existing vegetation due to maturing, pruning or natural development / decay. The significance will be **Imperceptible** and **Neutral**.

10.9 Summary

10.9.1 Landscape and Seascape Effects at Construction

Landscape, seascape and visual effects and their significance at construction stage will be temporary to short-term adverse.

Localised direct and landscape effects will arise within the Site, which is located within LCA 2: The Shannon Estuary. Considering the existing nature and location beside the existing SSE Tarbert Power Station, direct landscape effects are not considered significant.

Indirect landscape effects outside the Site will not be significant as a permanent loss of key features, such as the overall landscape structure, as the adjacent existing Tarbert HFO Power Station compound is already a prominent and distinct industrial feature in the landscape character. Together with Moneypoint Power Station, located across along the Co. Clare shoreline of the Shannon Estuary, it forms a significant industrial cluster in the estuarine environment.

Localised direct effects on the seascape character will arise within the Site, which is located within Regional Seascape Character Type 2: Large Estuary, and Regional Seascape Character Area SCA8: Shannon Estuary and Tralee Bay. Considering the existing nature and location beside the existing Tarbert HFO Power Station, direct seascape effects are not considered significant.

Outside of the Site boundary, the seascape character, including seascape character areas (SCA) identified by Clare County Council, namely SCA 10 Lower Shannon and SCA 11 River Shannon, will not alter due to the nature, scale and location of the Proposed Development and the associated construction works. The Proposed Development is only a small component in the overall size of the seascape character area and type. Seascape effects are therefore considered not significant in the wider study area.

10.9.2 Visual Effects at Construction

Visual effects during the construction stage will be experienced in the vicinity of the Site, from locations with open views of sections of the Proposed Development, including views across the Shannon Estuary from the Tarbert – Killimer Ferry, along locations of the northern shores and the associated elevated landscapes of Co. Clare as well as the southern shores towards Glin in County Limerick, west of the existing Tarbert HFO Power Station along the shores of Co. Kerry, and along the local road network where construction traffic will travel. Construction activity will not be visible to all of the visual receptors located within the study area due to intervening landform, vegetation and the distance from the Proposed Development. However, while construction works will be widely noticeable, they will be significant locally only, within approximately 500m - 1km from the Site. The effects of distance will reduce potential significant effects quickly to not significant. The construction of the Proposed Development will slightly intensify the existing visual industrial character of the Site and will be most noticeable within close to middle distance view within approximately 4km distance from the boundary of the Site where open views are along or across the estuary are available, particularly from elevated areas to the north along the R486, from the east along the local road through Lackyle and to the southeast, on elevated ground along the Glin loop Scenic Drive.

Long distance discernible views will extend to a distance of up to approximately 5km at Glin Quay and up to 6km where views of the taller components will be glimpsed along the N67 coast road. At this distance, visual effects will not be significant.

10.9.3 Landscape Effects at Operation

Direct and long-term change will occur locally where the Proposed Development will be physically located. The Proposed Development will slightly intensify the existing industrial character of the Site but not alter the landscape character locally or in the wider study area due to its scale, nature and location adjacent to the existing Tarbert HFO Power Station, which will remain the most prominent industrial feature along the southern shoreline of the Shannon Estuary. While the Proposed Development will introduce an additional industrial component to the existing industrial landscape character of the Site it will not result in significant landscape effects as it will integrate into the existing industrial setting of the area.

10.9.4 Seascape Effects at Operation

Direct effects on the Regional Seascape Character Type 2: Large Estuary, and Regional Seascape Character Area SCA8: Shannon Estuary and Tralee Bay at operation are considered not significant. While the Proposed Development will intensify slightly the industrial character of the Tarbert HFO Power Station complex, the development will not be uncharacteristic in the existing seascape character of the Site.

Outside of the Site boundary, the seascape character will not alter due to the nature, scale and location of the Proposed Development. The Proposed Development is only a small component in the overall size of the seascape character area and type and will not result in significant seascape effects.

10.9.5 Visual Effects at Operation

The main visual receptor groups are residents, vehicle travellers including ferry / ship passengers, workers and visitors. Residents will have the highest sensitivity to change than road users or ferry passengers. Vehicle users and workers will focus mainly on traffic or their commercial tasks and not primarily on available views. Ferry passengers will see the Proposed Development in conjunction with the prominent existing Tarbert HFO Power Station and Moneypoint Power Station structures.

The Proposed Development will add an industrial facility adjacent to the prominent existing Tarbert HFO Power Station. It will be seen in all available views in conjunction with the more prominent Tarbert HFO Power Station. In that respect, and considering the industrial character of the Site, the Proposed Development is not uncharacteristic in available views. However, it will intensify slightly the industrial character of estuarine views.

The highest visual change will be noticeable along sections of the N67 within approximately 800m from the Site to the south as illustrated in Viewpoints / Photomontages 03 & 04. Views from the remaining areas beyond 500-800 m within County Kerry will quickly become screened by intervening vegetation and topography and only the stacks of the existing Tarbert HFO Power Station will remain visible if at all.

Viewpoints / Photomontages 05, 06 & 07 illustrate views from within 4-6km from the Site boundary. Viewpoint / Photomontage 8 illustrates a middle-distance view to the southwest at approximately 4 km distance. Considering the location and the middle to long distance nature of views within 1 – 8km from the Site boundary, visibility will also depend on weather conditions and the level of haziness.

The majority of open views of the Proposed Development will be experienced from the Co. Clare side of the Shannon Estuary, where middle to long distance open views of the proposal will be possible. This includes most coastal roads within the study area as well as elevated sections of the N67 and R486 and adjoining local roads, refer to Viewpoints / Photomontages 01, 09 - 13. Visibility is generally considered middle to long distance in nature (beyond 1km) due to the width of the estuary. Despite the distance, the Proposed Development will be discernible, but it will not become a new focus point or landmark as the existing Tarbert HFO Power Station will remain dominant in views from the shoreline.

Similar as for views in Co. Kerry, existing views contain already large scale industrial or light industrial developments, and the Proposed Development will therefore not be out of character.

10.9.6 Effects at Decommissioning

Effects arising from the process of decommissioning of the Proposed Development are considered to be of a similar nature and duration to those arising during the construction process as summarised in Section 10.9.1 and 10.9.2.

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SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 11 Noise and Vibration

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Table of Contents

11.	Noise and Vibration.....	11-1
11.1	Introduction	11-1
11.2	Legislation, Policy and Guidance	11-1
11.3	Methodology	11-2
11.4	Baseline Environment.....	11-9
11.5	Potential Impacts	11-11
11.6	Mitigation Measures	11-22
11.7	Residual Impacts	11-26
11.8	Cumulative Impacts	11-28
11.9	Summary	11-33
11.10	References	11-35

Tables

Table 11.1:	Description of Significance of Effects	11-2
Table 11.2:	Description of Duration of Effects	11-2
Table 11.3:	Maximum Permissible Noise Levels at the Façade of Dwellings During Construction ...	11-3
Table 11.4:	BS5228-1 Construction Noise Criteria.....	11-4
Table 11.5:	BS5228-2 Vibration Criteria: Human Perception	11-5
Table 11.6:	NRA Guidelines Vibration Criteria: Structural Damage	11-5
Table 11.7:	Magnitude of Impact: Construction Phase Traffic.....	11-6
Table 11.8:	Recommended Operational Noise Limit Criteria	11-8
Table 11.9:	Approximate Distance to NSR from the Transformer Wall Boundary	11-10
Table 11.10:	NSR1: Short-term Measured Baseline Sound Levels	11-10
Table 11.11:	Comments and Subjective observations during baseline measurements.	11-11
Table 11.12:	Relevant Construction Noise Criteria	11-13
Table 11.13:	Construction Programme.....	11-13
Table 11.14:	Plant and Associated Sound Power Levels – All Construction Phases.....	11-14
Table 11.15:	Assumed Sound Power Level for All Construction Activities Combined.....	11-15
Table 11.16:	Representative HDV Spectrum Sound Power Levels	11-16
Table 11.17:	LDV 1/3rd Octave spectrum and A-Weighted Broadband Level	11-16
Table 11.18:	Predicted Construction Noise Level at Receptors for Peak and Typical Month - Piling and Foundations work stage	11-17
Table 11.19:	Construction Phase Traffic.....	11-18
Table 11.20:	Change in Road Traffic Noise Level Resulting from Construction Traffic	11-18
Table 11.21:	Proposed Development Fixed Plant Noise Levels	11-20
Table 11.22:	Operational Sound Levels at Receptors - Unmitigated	11-21
Table 11.23:	Reference Spectrum for Sound Power Level of Unmitigated Air Intake Components combined.....	11-24
Table 11.24:	Reference Spectrum for Sound Power Level of Reverberant Gas Turbine Building ..	11-24
Table 11.25:	Louvre mitigation	11-25
Table 11.26:	Improved Gas Turbine building cladding	11-25
Table 11.27:	Predicted Mitigated Sound Pressure Levels at NSRs for Example Interventions	11-25
Table 11.28:	A summary of the residual effects following the application of construction mitigation measures.....	11-26
Table 11.29:	A summary of the residual effects following the application of operational mitigation.	11-27
Table 11.30:	Predicted Cumulative Sound Pressure Levels	11-29

Appendices (Refer to EIAR Volume II)

Appendix 11A: Glossary of Terms

Appendix 11B: Acoustic Modelling Details

Figures (Refer to EIAR Volume III)

Figure 11.1: Noise Sensitive Receptors and Site Layout

Figure 11.2: Location of Road Links 1-4 for Construction Traffic Management

Figure 11.3a: Predicted Construction Noise Levels in the Typical Month

Figure 11.3b: Predicted Construction Noise Levels in the Peak Month - Piling Location 1

Figure 11.3c: Predicted Construction Noise Levels in the Peak Month - Piling Location 1

Figure 11.3b: Predicted Construction Noise Levels Piling and Foundation Stage - Piling Location 1

Figure 11.3e: Predicted Construction Noise Levels Piling and Foundation Stage - Piling Location 2

Figure 11.4: Predicted Operation Noise Level Post Mitigation.

11. Noise and Vibration

11.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) assesses the potential noise and vibration impacts and effects associated with the Proposed Development. A full description of the Site, and the Proposed Development are provided within EIAR Chapters 4 (Existing Site and Conditions) and 5 (Description of the Proposed Development) respectively.

This chapter also describes the methods used to assess the effects, the baseline conditions currently existing at the Site and surrounding area, the measures required to prevent, reduce, or offset any significant adverse effects, and the likely residual effects after these measures have been adopted.

11.2 Legislation, Policy and Guidance

The following outlines the main relevant legislation, policy and guidance that has been applied in this chapter:

- **EPA Guidelines 2022:** The Environmental Protection Agency (EPA) *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*¹ are Guidelines written to facilitate the implementation of Directive 2011/92/EU as amended by EU Directive 2014/52/EU in Ireland. These guidelines provide guidance on the assessment and description of environmental impacts.
- **NG4:** *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities*².
- **NRA Guidelines:** *Guidelines for the Treatment of Noise and Vibration in National Road Schemes*³.
- **BS5228-1:** *BS5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Noise'*.
- **BS5228-2:** *BS5228-2:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Vibration'*.
- **ISO 9613:** *ISO 9613-2:1996 – Attenuation of sound during propagation outdoors*

Additional references are provided in Section 11.10.

¹ EPA (2022). *Guidelines on the Information to be contained in Environmental Impacts Assessment Reports*.

² EPA (2016). *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities*.

³ NRA (2004). *Guidelines for the Treatment of Noise and Vibration in National Road Schemes*.

11.3 Methodology

11.3.1 Study Area

The study area for assessment of on-site construction (and decommissioning) noise and vibration and operational noise is defined as an area extending from the Site of the Proposed Development up to and including the nearest most exposed sensitive receptor locations. If compliant levels of noise and vibration are predicted at the nearest most exposed sensitive receptor locations, it follows that compliant levels will be achieved at all other locations.

The study area for offsite traffic noise is the same as identified in the transport assessment, detailed in Chapter 14 (Traffic and Transport).

11.3.2 Determination of the Baseline Environment

The baseline acoustic environment has been determined via several long-term surveys conducted in and around the Site. These surveys are detailed in Section **Error! Reference source not found..**

11.3.3 Describing Potential Effects

With reference to the EPA Guidelines⁴, effects are described under various headings, including Magnitude, Quality, Significance, Extent and Context, Probability, Duration and Frequency. Of particular relevance are the definitions of significance and duration, which are provided in Table 11.1 and Table 11.2 respectively.

Table 11.1: Description of Significance of Effects⁵

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

Table 11.2: Description of Duration of Effects⁶

Aspect	Description
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting less than a year

⁴ EPA (2022). *Guidelines on the Information to be contained in Environmental Impacts Assessment Reports.*

⁵ EPA (2022).

⁶ EPA (2022).

Aspect	Description
Short-Term	Effects lasting from one to seven years
Medium-Term	Effects lasting from seven to 15 years
Long-Term	Effects lasting from 15 to 60 years
Permanent	Effects lasting over 60 years
Reversible	Effects that can be undone, e.g., through remediation or restoration
Frequency	How often the effect will occur

11.3.4 Significance of Effects: Construction Phase

11.3.4.1 Introduction

To determine potential temporary noise and vibration impacts and effects during the construction phase of the Proposed Development, the following matters have been considered:

- noise caused by construction site activities; and
- noise caused by increases in traffic on public roads during the construction phase.

A detailed assessment of construction related vibration has been scoped out due to the distance to the nearest receptor being large enough that the values for human perception or structural damage in Table 11.5 and Table 11.6 will not be reached.

This conclusion is based on the guidance provided in BS5228-2:2009+A1:2014 '*Code of practice for noise and vibration control on construction and open sites. Vibration*' (BS5228-2), which provides piling vibration prediction methodologies up to a maximum of 110m, meaning that construction activities do not produce large enough vibrations to warrant concern beyond this range. In addition, the construction vibration assessment methodology adopted in Highways England document '*Design Manual for Roads and Bridges LA 111 Noise and vibration*' (LA 111) for assessing road schemes, recommends that a maximum study area of 100m is normally sufficient.

11.3.4.2 Criteria: Noise from Onsite Construction Activities

Transport Infrastructure Ireland (TII)⁷ is the only government body in Ireland to publish construction noise limits, which are presented in the NRA Guidelines.

It is acknowledged that the limits presented in the NRA Guidelines relate to construction works for road schemes, however, noise sensitive receptors (NSR) are likely to be equally sensitive to construction noise from other project types.

The criteria presented in the NRA Guidelines are presented in Table 11.3.

Table 11.3: Maximum Permissible Noise Levels at the Façade of Dwellings During Construction⁸

Period	L _{Aeq,1hr} dB	L _{p(max)} slow dB
Monday to Friday - 07:00 to 19:00	70	80
Monday to Friday - 19:00 to 22:00	60 ¹	65 ¹

⁷ formerly the National Roads Authority (NRA)

⁸ NRA (2004).

Period	$L_{Aeq,1hr}$ dB	$L_{p(max)}$ slow dB
Saturday - 08:00 to 16:30	65	75
Sundays and Bank Holidays - 08:00 to 16:30	60 ¹	65 ¹

¹ Construction activity at these times, other than that required in respect of emergency works, will normally require the explicit permission of the relevant local authority

Potential construction noise effects can also be assessed using *BS5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites'* (BS5228-1).

The 'ABC' method (detailed in BS5228-1 Section E.3.2) has been used to develop criteria. Using this method, the construction noise limits for the Proposed Development are determined by rounding the ambient noise levels ($L_{Aeq,T}$) to the nearest 5dB and then comparing this level to the Category A, B and C values given in BS5228-1, as reproduced in Table 11.4.

Table 11.4: BS5228-1 Construction Noise Criteria

Assessment category and threshold value period	Threshold Value $L_{Aeq,T}$ dB		
	Category A ^(a)	Category B ^(b)	Category C ^(c)
Night-time (23:00 - 07:00)	45	50	55
Evenings and weekends (d)	55	60	65
Daytime (07:00 - 19:00) and Saturdays (07:00 - 13:00)	65	70	75

NOTE 1: A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.

NOTE 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.

NOTE 3: Applies to residential receptors only.

(a) Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

(b) Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as Category A values.

(c) Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than Category A values.

(d) 19:00 - 23:00 weekdays, 13:00 – 23:00 Saturdays, 07:00 – 23:00 Sundays.

For the purposes of this assessment, the criteria given in both the *NRA Guidelines* and *BS5228-1* will be considered. Where the criteria differ, the more stringent of the two will be adopted. Where the adopted criterion is predicted to be exceeded a significant effect at the NSR is predicted, and where the criterion is not exceeded no significant effect at the NSR is predicted, subject to context considerations.

11.3.4.3 Criteria: Vibration from Onsite Construction Activities

There are two types of construction vibration criteria: those dealing with human perception and those dealing with structural damage to buildings.

Table B.1 of BS5228-2 presents vibration criteria with regards human perception. These are presented in Table 11.5 with descriptions of likely reactions.

Table 11.5: BS5228-2 Vibration Criteria: Human Perception

Magnitude of impact	Peak Particle Velocity (PPV)	Description
Major	$\geq 10\text{mm/s}$	Vibration is likely to be intolerable for any more than a very brief exposure to this level.
Moderate	$>1.0\text{mm/s}$	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.
Minor	$>0.3\text{mm/s}$	Vibration might be just perceptible in residential environments.
Negligible	$>0.14\text{mm/s}$	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.

Table 2 of the *NRA Guidelines* provide construction vibration criteria identified to control potential for vibration damage during construction. These criteria are presented in

Table 11.6.

Table 11.6: NRA Guidelines Vibration Criteria: Structural Damage

Allowable vibration velocity (Peak Particle Velocity) at the closest part of any sensitive property to the source of vibration, at a frequency of

Less than 10Hz	10 to 50Hz	50 to 100Hz (and above)
8mm/s	12.5mm/s	20mm/s

11.3.4.4 Criteria: Noise from Increased Traffic Flows during the Construction Period

The potential increase in noise levels resulting from changes to road traffic flows during the construction period have been determined in accordance with the *NRA Guidelines (2004)*, which refer to the Calculation of Road Traffic Noise, Department of Transport, Welsh Office, 1988 (CRTN) methodology.

The change in noise level for relevant links has been predicted based on the CRTN⁹, Basic Noise Level (BNL) methodology. However, the CRTN methodology is not reliable for very low traffic flows (below 1000 AAWT). A commonly accepted approach where flows of this magnitude are predicted, the Noise Advisory Council (NAC) prediction method detailed in the document '*A Guide to Measurement and Prediction of the Equivalent Continuous Sound Level L_{eq}* ' is used.

These methodologies have been used to calculate the BNL i.e., the traffic noise level at 10m from the kerb as a function of vehicle flow rate, percentage HDV and averaged speed. BNL predictions have been undertaken for both "with" and "without" construction traffic scenarios, for each road link in the construction traffic model, using 18-hour Annual Average Weekly Traffic (AAWT) flows provided by the Project Transport Consultants (refer to EIAR Volume II Appendix 14A).

The CRTN and NAC methodologies predict different metrics; CRTN predictions are based on $L_{A10,18hr}$ results whereas the NAC predictions are based on $L_{Aeq,16hr}$ results. $L_{A10,18hr}$ is a statistical value that can be thought of as the level exceeded 10% of the 18-hour reference period, whereas $L_{Aeq,16hr}$ is the single value equivalent noise level over a reference period of 16 hours (in other words it can be thought of as

⁹ Department of Transport (1998). *Calculation of Road Traffic Noise*.

an average noise levels). This difference is not significant however, because it is the change in traffic noise level that is relevant.

No specific Irish guidance containing criteria for assessment of the noise effects from construction traffic changes has been published. The criteria for the assessment of noise changes arising from construction road traffic have therefore been taken from Table 3.17 of the *Design Manual for Roads and Bridges (DMRB, 2020) LA 111 Revision 2¹⁰*, as presented in Table 11.7.

Table 11.7: Magnitude of Impact: Construction Phase Traffic¹¹

Magnitude of Impact	Increase in BNL (LA_{10,18hr} dB) on Closest Public Roads used for Construction
No Change	0
Negligible	0.1 to 0.9
Minor	1.0 to 2.9
Moderate	3.0 to 4.9
Major	5+

11.3.4.5 Construction Phase: Special Areas of Conservation (SAC) and Other Ecological Receptors

The impact of construction phase noise and vibration emissions on habitats and species of Special Areas of Conservation (SAC) and other ecological receptor positions are discussed in Chapter 9 (Biodiversity).

11.3.5 Significance of Effects: Operational Phase

11.3.5.1 Introduction

To determine the potential noise and vibration impacts during the operational phase, the following matters have been considered:

- noise caused by site operations; and
- noise caused by increases in traffic on existing roads.

A detailed assessment of operational vibration has been scoped out due the nature of the activities and distance to the nearest receptor. Operational vibration effects are expected to be no different to that experienced previously at the site.

11.3.5.2 Criteria: Operational Phase Site Noise Emissions

The Proposed Development will comply with the requirements of the *EU (Large Combustion Plants) Regulations 2012, S.I. No. 566 of 2012*, under an IE Licence. The Proposed Development will require a licence from the EPA and this will likely be incorporated by a review of the existing IE licence.

Guidance on permissible noise emission limits for licensed facilities is contained in NG4 (see 11.2). NG4 refers to Best Available Techniques (BAT) as a form of noise mitigation which is defined in Section

¹⁰ Highways England (2020). *Design Manual for Roads and Bridges (DMRB) LA 111 Noise and vibration*.

¹¹ Highways England (2020).

7 of the *Protection of the Environment Act* (2003) but more directly under section 5(1) and 5(2) of the *Environmental Protection Agency Act 1992* (as amended) as follows:

“(2) In subsection (1)

(a) ‘best’, in relation to techniques, means the most effective in achieving a high general level of protection of the environment as a whole;

(b) ‘available techniques’ means those techniques developed on a scale which allows implementation in the relevant class of activity specified in the First Schedule, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced within the State, as long as they are reasonably accessible to the person carrying on the activity;

(c) ‘techniques’ includes both the technology used and the way in which the installation is designed, built, managed, maintained, operated and decommissioned.”

NG4 section 4.3 states that:

‘ All reasonably practicable measures should be adopted at licensed facilities to minimise the noise impact of the activity, and BAT (Best Available Techniques) should be used in the selection and implementation of appropriate noise mitigation measures and controls.’

NG4 also provides criteria for use in noise assessments, which vary depending on whether the location of the development is in a ‘Quiet Area’ or an ‘Area of Low Background Noise’. Where a development meets neither of these it is assigned “All Other Areas” criteria, all of which explained further below.

A ‘Quiet Area’ is defined as a location that meets the following criteria:

- At least 3km from urban areas with a population >1,000 people;
- At least 10km from any urban areas with a population >5,000 people;
- At least 15km from any urban areas with a population >10,000 people;
- At least 3km from any local industry;
- At least 10km from any major industry centre;
- At least 5km from any National Primary Route; and
- At least 7.5km from any Motorway or Dual Carriageway.

An ‘Area of Low Background Noise’ is a location that meets the following criteria:

- Average Daytime Background Noise Level $\leq 40\text{dB L}_{\text{AF90}}$;
- Average Evening Background Noise Level $\leq 35\text{dB L}_{\text{AF90}}$, and
- Average Night-time Background Noise Level $\leq 30\text{dB L}_{\text{AF90}}$.

The criteria presented in NG4 are detailed in Table 11.8. “All other Areas” applies to the Proposed Development as is discussed.

Table 11.8: Recommended Operational Noise Limit Criteria¹²

Scenario	Daytime Noise Criterion dB L _{ar,T} (0700 to 1900 hours)	Evening Noise Criterion dB L _{ar,T} (1900 to 2300 hours)	Night-time Noise Criterion dB L _{Aeq,T} (2300 to 0700 hours)
Quiet Area	Noise from the licensed site to be at least 10dB below the average daytime background noise level measured during the baseline survey.	Noise from the licensed site to be at least 10dB below the average evening background noise level measured during the baseline survey.	Noise from the licensed site to be at least 10dB below the average night-time background noise level measured during the baseline survey.
Areas of Low Background Noise	45dB	40dB	35dB
All other Areas	55dB	50dB	45dB

The criteria are given in terms of a Rated Noise Level (L_{ar,T}) which is defined in NG4 as:

The Rated Noise Level, equal to the L_{Aeq} during a specified time interval (T), plus specified adjustments for tonal character and/ or impulsiveness of the sound.

The method for applying adjustments for tonal and/ or impulsive characteristics is described in NG4 section 5 and has been considered in this assessment. Noting that NG4 states that tonal and/or impulsive characteristics should not be audible at night-time at the receptor:

“All licensed facilities should use BAT to attempt to eliminate and control tonal components when identified, although it is acknowledged that it may be impractical to always completely eliminate some of these characteristics. At night-time, however, there should be no audible tonal noise at any Noise Sensitive Location (NSL).” And,

“While all licensed facilities should use BAT to eliminate and control impulsive components, it may be impractical to always completely eliminate some of these characteristics. At night-time, however, there should be no audible impulsive characteristic to the noise at any NSL.”

The criteria adopted for this operational assessment is discussed in Section 11.5.3.1.

11.3.5.3 Noise from Increased Traffic Flows on Existing Roads during the Operational Phase

The potential increase in noise levels resulting from changes to road traffic flows during the operational phase has been assessed. However, Chapter 14 (Traffic and Transport), has scoped out a detailed operational phase traffic assessment due to the minimal operational traffic associated with the Proposed Development.

The Site will generate a peak of 18 HDV trips per day, and is therefore considered, in Chapter 14 (Traffic and Transport), to not result in significant noise impacts on the surrounding road network on the basis that the additional trips would not be noticeable against the current traffic flows experienced on the route.

¹² EPA (2016). *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities*.

A more detailed assessment of operational phase traffic has therefore been scoped out.

Given the low number of Proposed Development related vehicle movements on existing road networks per day during the operational phase, noise impacts are likely to be **Negligible** or less in the operational phase and therefore no further assessment has been undertaken.

11.3.5.4 Operational Phase: SAC and other Ecological Receptors

The impacts of the operational phase noise emissions on the SAC and other ecological receptors are discussed in Chapter 9 (Biodiversity).

11.3.6 Limitations and Assumptions

The following limitations and assumptions apply to the assessment:

- The sound levels measured during the acoustic surveys undertaken as part of the previous surveys and annual compliance testing that are referenced in this chapter are representative of the baseline acoustic environment.
- The construction equipment list and on-times represents the worst-case scenario. Therefore although the appointed contractor may make slight changes to the construction equipment used and timings, this will be within the parameters described and assessed in this planning application.
- The precise size, configuration, performance, and layout of the operational equipment will be finalised following the award of a contract with an equipment supplier, within the parameters set out in this planning application. For the purposes of this planning application and EIAR, consideration of environmental impacts is on the basis that NSR are considered to be in the “far-field”.
- The calculated noise levels presented in the report have been established using CadnaA 3D noise modelling software. Within the software we have undertaken
 - Construction noise level predictions using *BS5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites'* and
 - Operational noise level prediction using *ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation*.

The *Calculation of Road Traffic Noise*¹³ has also been used to predict the relative changes on the local road network.

The assessment is therefore subject to the assumptions and limitations detailed within these standards.

None of the limitations or assumptions affect the efficacy of the assessment of the predicted results.

¹³ Department of Transport Welsh Office (1988).

11.4 Baseline Environment

11.4.1 Existing Receptors

The approximate distances to the transformer wall boundary (adjacent to the closest operational sound source) from the closest NSRs have been provided in Table 11.9. The locations of these NSRs are also shown in Figure 11.1 (refer to EIAR Volume III). All NSRs are to the south of the Proposed Development. Only NSRs up to 1km have been considered as controlling effects of noise at these locations will inherently mean they are controlled at more distant receptors.

Table 11.9: Approximate Distance to NSR from the Transformer Wall Boundary

Receptor	X (m)	Y (m)	Approximate Distance (m)
NSR1	507471	649266	245
NSR2	507423	649020	505
NSR3	507235	648493	1050

11.4.2 Baseline Measurements

A baseline noise survey was not undertaken in 2023 in relation to this application due the prevailing acoustic conditions at NSR1 in particular, being considered potentially unrepresentative. This was primarily due to ongoing construction activity in the area in relation to the Temporary Emergency Generator (TEG) facility.

Baseline sound measurement data has been collected from surveys undertaken by third parties from as recently as 2022, prior to construction works and is therefore considered more relevant:

- Enovi in 2018 as part of a planning application for a Battery Energy Storage Site (BESS) to be located on what is instead now the TEG site; and
- Axis Environmental Services in 2021 and 2022 at three locations as part annual compliance testing, one of which is approximately 60m east of NSR1 and is therefore close enough to be considered representative of NSR1. The data has been collected and submitted to EPA as part of the annual compliance measurements and the information is summarised in Table 11.10 for the location representative of NSR1. For Day and Night periods the arithmetic average of measurements is presented.

A summary of the baseline levels can be found in Table 11.10. It is worth noting how the $L_{A90,T}$ remains quite consistent from year to year. It also worth noting that the 2018 measurement is a 24-hour measurement rather than a short measurement.

Table 11.10: NSR1: Short-term Measured Baseline Sound Levels

Date	Period	Measurements	$L_{Aeq,T}$ (dB)	L_{AFmax} (dB)	L_{A90} (dB)
09-04-18 to 10-04-18	Day	24 hr	-	-	41
	Night	(15min intervals)	-	-	42
24-05-21	Day	3 x 30 min (conseq.)	49	69	40
	Evening	1 x 30 min	50	71	46
	Night	2 x 30 min	51	68	44

Date	Period	Measurements	L _{Aeq,T} (dB)	L _{AFmax} (dB)	L _{A90} (dB)
09-04-18 to 10-04-18	Day	24 hr	-	-	41
	Night	(15min intervals)	-	-	42
28-04-22	Day	3 x 30 min (conseq.)	58	78	40
	Evening	1 x 30 min	46	72	38
	Night	2 x 30 min	43	53	38

Subjective observations of sound sources are provided in Table 11.11 as reported by the third party (Axis Environmental) during the aforementioned measurements.

Table 11.11: Comments and Subjective observations during baseline measurements.

Date	2018	2021	2022
Day	During the day, the background noise level (LA90) ranged from 39 to 43dB. The noise level measured was observed to be steady and continuous and influenced predominantly by an existing onsite transformer.	Car movements passing close to the meter were the most striking sounds during daytime testing. Due to this LA90 is used. ESB overhead electric powerline was heard throughout the survey. People talking and an abrasive work equipment being used; in a local residential dwelling audible during surveying.	The main source of noise was the traffic movements on the N67, <2m away from the noise meter. Operational noise from SSE Generation Ireland Ltd was audible as a continuous hum from unit three. Also perceptible was the ESB who were doing repair works on a nearby electrical station. The noise recorded from the ESB was a hammering sound for the duration of the survey.
Evening	For the distribution of day-time value measured between 1100 to 2300 on 9 th April and 0700 to 2215 on 10 th April, 41dB(A) is considered representative in the instance and in this instance was the most commonly occurring background noise level and the average measured value.	Car movements passing the meter was the most noteworthy noise during evening testing. Due to this the LA90 is used. ESB overhead electric powerline was heard throughout the survey. People talking and waves lightly crashing against the shore was audible during evening surveying.	Cars passing on the N67 was a significant interference, though the movements were infrequent. An operational hum from SSE was the main background noise during testing.
Night	During the day, the background noise level (LA90) ranged from 40 to 43dB. The noise level measured was observed to be steady and continuous and influenced predominantly by an existing onsite transformer. For the distribution of night-time value measured between 2300 to 0700 on 9 th to 10 th April, 42dB(A) is considered representative in the instance and in this instance was the most commonly occurring background noise level and the average measured value.	Car movements passing the meter was the most significant noise during night testing. Due to this LA90 is used. ESB overhead electric powerline was heard throughout the survey. Waves lightly crashing against the shore was audible during night-time surveying.	The infrequent passing of cars caused peaks in measurements during the monitoring period. Operational noise from SSE Generation Ireland Ltd was perceptible during testing as a constant hum.

11.5 Potential Impacts

Noise emissions from the Proposed Development will occur in three distinct phases: construction operation and decommissioning.

Construction and operational vibration has been scoped out of consideration in this assessment as stated in 11.3.4 and 11.3.5.

During the construction phase, noise levels are expected to vary depending on the work being carried out. Noise levels will likely be highest during the initial enabling period whilst louder activities such as earthworks and piling take place. As the construction phase develops, noise levels are expected to reduce as less noisy works (plant installation, internal works within structures) take over.

Noise levels during the operational phase will be emitted principally from the gas turbine building air inlet, the top of a 55m tall chimney stack, and associated equipment, such as transformers, fan coolers and exhausts. Sound emissions are not expected to possess distinctive characteristics such as tonality or impulsiveness from the nearest sensitive receptors perspective as these would need to be designed out to meet the requirements of NG4 in section 4.3 which states, “*During the night-time period no tonal or impulsive noise from the facility should be clearly audible or measurable at any NSR*”. Emissions during the operational phase will comply with expected fixed permitted limits by the EPA, based on current best practice for this type of facility, and which are more stringent during the night-time.

During months 25 to 27 of the construction phase, there will be scheduled fuelling and commissioning of the Proposed Development. It is likely some noise sources, i.e., turbine air inlet, stack, transformers associated with operation will occur concurrently with construction activities. If this does occur, no change to the outcomes of this assessment are expected as operational level contribution would be negligible against construction and/or ambient levels combined. This is because the noise limits for operational phase noise are significantly more stringent than those applied to construction phase sources. As a result, any operational phase noise emissions that occur during the construction phase will not contribute to overall ambient sound levels.

As outlined in Chapter 5 (Description of the Proposed Development), in the event of decommissioning, measures will be undertaken to ensure that there will be no significant, negative environmental effects. The equipment and programme for the decommissioning phase are expected to not produce sound emissions any worse than those experienced during the construction phase. Proposed mitigation measures that will be implemented are outlined in Section 5.6 of Chapter 5 and relevant to both construction and decommissioning phases. It is acknowledged these measures may be updated in accordance with changes in best practice at the time of decommissioning as approved by the local authority.

11.5.1 Construction Phase: Site Operations

By comparison of the measured baseline sound levels presented iA summary of the baseline levels can be found in Table 11.10. It is worth noting how the $L_{A90,T}$ remains quite consistent from year to year. It is also worth noting that the 2018 measurement is a 24-hour measurement rather than a short measurement.

Table 11.10 and Table 11.11, the construction noise threshold at NSR1 in the vicinity of the Proposed Development is ‘Category A’ with regards to the BS5228-1 ABC criteria presented in Table 11.4. The noise threshold for NSR2 and NSR3 is also set as Category A as the ambient sound level are likely to be comparable to NSR1 and this is the most conservative approach.

A construction contractor has not yet been appointed, however the construction working hours will be 0700-1900 Monday to Friday and 0800-1500 on Saturdays. Therefore, the Weekday Daytime and Saturday noise limits apply. If construction works are required to take place outside of these times it will be ensured that such works do not give rise to significant noise effects, this will be agreed in advance with the prior agreement of Kerry County Council (KCC),

Construction noise criteria derived from either BS5228, or the NRA Guidelines are presented in Table 11.12. The criteria apply at one metre from the façade of NSRs. The BS5228-1 criteria is the most stringent noise threshold values in the planned construction working hours and 65dB $L_{Aeq,T}$ is therefore the relevant limit used in this assessment, with exception of 13:00 to 15:00 on Saturdays where 55dB $L_{Aeq,T}$ applies, as this more stringent than NRA Guidelines in the same period. However, it is important to note that during the period 13:00 to 15:00 on Saturdays that activities producing significant noise levels will not be undertaken, instead works will be limited to quieter activities such as servicing equipment, performing site checks on spill kits and stores, etc. Therefore, this assessment focuses only on 0700-1900 Monday to Friday and 0700-1300 Saturdays when noisier works will be undertaken,

Table 11.12: Relevant Construction Noise Criteria

Period	Time	BS 5228 Criteria Category A	NRA Guidelines
Weekday Daytime	07:00 - 19:00	65dB $L_{Aeq,T}$	70dB $L_{Aeq,T}$
Saturday Daytime	07:00 - 13:00	65dB $L_{Aeq,T}$	-
	08:00 - 16:30	-	65dB $L_{Aeq,T}$
Saturday Afternoon to Evening	13:00 - 23:00	55dB $L_{Aeq,T}$	

The construction phase of the Proposed Development will be approximately 29 months, comprising four activities as detailed in Table 11.13.

Table 11.13: Construction Programme

Site Action	Time Period
Mobilisation and Site Prep	Months 1-7
Demolition	Months 3-8
Construction Works	Months 7-27
Fuelling and Commissioning	Months 25-29

A proposed list of mechanical plant operating on-site during these periods has been assessed. The predicted numbers of LDV/HDV trips during construction phase have also been assessed. The equipment and quantities will be reviewed by the appointed Contractor and updated, if necessary, but will not affect the outcome of this assessment. The next two subsections establish the sound power level assumptions used to predict construction noise levels at NSRs from construction site activities within the Site, this includes static equipment and LDV/HDV trips to bring equipment/materials in and out of the Site.

11.5.1.1 Assumed Sound Power Levels of Construction Equipment

Sound power levels for each plant item present have subsequently been assigned from archive data presented in BS5228-1. The plant and associated sound power levels (L_{WA}) for main construction are presented in Table 11.14 along with the anticipated on-times. This assessment has identified that the peak month will be month seven as is it the period where the mobilisation and site preparation,

demolition and construction works activities overlap according to the construction programme provided. Assessment against the peak and typical month is undertaken to provide context of the range that NSRs may experience, “at worst” and “as usual” respectively.

Table 11.14: Plant and Associated Sound Power Levels – All Construction Phases

Plant / Equipment	Sound Power Level dBA	% on time	Mobilisation & Site Preparation	Demolition	Equipment quantities for each stage			
					Construction Works			
					Piling and Foundation Works	Building & General Site Activities	Fit Out	Landscaping
Compressors	108	60	2	3	6	6	6	0
Hand held pneumatic breaker	111	60	3	3	0	0	0	0
Dump truck (tipping fill)	107	60	2	2	2	0	0	0
Dump truck (passby)	115	60	3	3	3	0	0	0
Wheeled loader	108	60	0	0	0	2	0	0
Lorry (delivery and collection)	108	60	4	2	6	6	6	0
Water pump (20 kW)	93	60	0	0	0	1	0	0
C.3.1 Hydraulic hammer rig 145 16 m length / 5 t	117	60	0	0	4	0	0	0
Hand-held welder (welding piles)	101	60	0	0	1	0	0	0
Generator for welding	101	60	0	0	1	0	0	0
Dumper (idling)	91	60	0	0	0	1	0	0
Wheeled backhoe loader	95	60	0	0	0	2	0	0
Tracked excavator	99	60	5	5	5	5	0	0
Concrete mixer truck	108	60	6	6	10	10	0	0
Truck mounted concrete pump and boom arm	108	60	0	0	3	3	0	0
Poker vibrator	106	60	0	0	0	1	0	0
Wheeled mobile telescopic crane	106	60	2	2	4	4	4	0
Tower crane	105	60	1	1	2	2	2	0
Lorry with lifting boom	105	60	1	1	0	0	1	0
Lifting platform	95	60	0	0	0	0	1	0
Fork lift truck	103	60	0	0	0	4	1	0
Mini tracked excavator	102	60	0	0	0	0	1	0
Electric core drill (drilling concrete)	113	60	0	0	0	1	1	0
Concrete floor cutter	119	60	0	0	0	1	1	0
Hand-held circular saw (cutting paving slabs)	112	60	0	0	0	0	1	0
Roller	101	60	0	0	0	0	0	1
Diesel generator for site cabins	94	60	4	2	2	2	2	1
Diesel generator for site lighting	93	60	1	1	2	2	2	1
Road sweeper	96	60	1	1	1	1	1	1

Equipment quantities for each stage								
Plant / Equipment	Sound Power Level dBA	% on time	Mobilisation & Site Preparation	Demolition	Piling and Foundation Works	Construction Works		
						Building & General Site Activities	Fit Out	Landscaping
Angle grinder	108	60	1	1	1	1	1	0
Hand-held cordless nail gun	101	60	0	0	0	0	1	0
Road planer (road construction)	110	60	0	0	0	1	0	0
Vibratory compactor (asphalt)	110	60	0	0	0	1	0	0
Asphalt paver + tipper lorry	105	60	0	0	0	1	0	0
Electric water pump	96	60	2	2	2	2	2	0
Screen stockpiler	115	75	0	1	0	0	0	0
Concrete breaker mounted on wheeled backhoe	120	75	0	3	0	0	0	0
Tracked crusher	112	75	0	1	0	0	0	0

Table 11.15 presents the total sound power level for each construction stage used in this assessment to predict noise levels at receptors. During the Piling and Foundation works stage, the piling activities can be frequent and predicted levels at sensitive receptors are highly dependent on the distance to the receptor. Piling has been considered in two extreme positions, at the southern façade of Gas Turbine Building which is the closest piling position to NSR1 and at a tank which closest piling position to the River Shannon (to inform the ecological assessment). When the piling is separated from the 125dB L_{WA} Piling and Foundation works stage, the piling at each location is 117dB L_{WA} and the remaining activities in that stage amount to 124dB L_{WA}.

In month seven three site actions as referred in Table 11.13 overlap, and henceforth this is referred to this as the peak construction noise level month. Note that to determine a sound power level for the peak construction noise level month the Piling and Foundation Work stage has been combined with Mobilisation and Site Preparation, and Demolition Stages. This is logical as it will occur earlier in the programme. Combining these three stages the peak sound power level for month seven of the construction programme is calculated as 129dB L_{WA}. The piling position closest to NSR1 is used when making predictions for the peak month. The typical month (that which occurs most frequently) would be 125 to 126dB L_{WA}, we take 126dB L_{WA} as being representative of the typical month, no piling locations are used when making predictions for the typical month as this is covered in the Piling and Foundation Works stage predictions.

Table 11.15: Assumed Sound Power Level for All Construction Activities Combined

Mobilisation & Site Preparation	Demolition	Construction Works			
		Piling & Foundation Works	Building & General Site Activities	Fit Out	Landscaping
122	126	125	123	121	101

11.5.1.2 Assumed Sound Power Levels of Construction HDV Movements on Site

A total 278 LDV and 44 HDV vehicles moving between the construction area and main gate each day has been assessed (refer to EIAR Volume I Chapter 14 and Volume III Figure 11.1 for a map indicating the construction area). Predictions have assumed these movements will all occur within the 12-hour day on weekdays and 6-hour day on Saturdays and calculated that LDV 69.5 active mins and HDV 11 active mins within those reference periods based on a 15 second pass-by duration along the access route based on predicted construction site speed limits. An HDV spectrum and a maximum pass-by sound power level taken from BS5228-1 reference C.2.34 used to represent a single HDV and provided in Table 11.16. A representative LDV spectrum has been determined using the Harmonoise model and is presented in Table 11.17.

Table 11.16: Representative HDV Spectrum Sound Power Levels

	63	125	250	500	1k	2k	4k	8k	dBA
HDV Pass-by C.2.34	101	106	106	106	102	101	96	94	108

Table 11.17: LDV 1/3rd Octave spectrum and A-Weighted Broadband Level

1/3 Octave Sound Power Levels (Linear) dB													
25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
87	87	87	88	90	90	89	85	84	85	86	86	85	85
630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	dBA
86	88	89	89	88	87	85	83	81	78	76	74	71	98

11.5.1.3 Predicted Sound Pressure Levels of Construction Activity at NSRs

Specialist environmental noise level modelling software CadnaA was used to predict construction noise levels at NSRs.

The construction site area was represented by a polygon covering the main area within the red line boundary where construction activity, mentioned in Table 11.14 and Table 11.15, will be concentrated. This polygon is marked on EIAR Volume III Figure 11.1.

All construction activity have been modelled as an area source covering the main construction area at 3m height and assigned as either 124dB L_{WA}, 126dB L_{WA} or 129dB L_{WA} as just discussed depending on the scenario being calculated. In the case of the peak and piling and foundation works stage scenarios a point source at 20 height was also assigned 117dB L_{WA} to represent piling activities at 'Location 1' which is at the southern façade of the Gas Turbine Building, as this is the worst case for human sensitive receptors. 'Location 2' was also modelled for input to the ecological assessment.

The HDV construction vehicles moving between the main access road between N67, and the construction area were represented by a line source. The line source was configured using the representative HDV spectrum and a maximum pass-by sound power level taken from BS5228-1

reference C.2.34. An on-time correction was applied to account for the non-continuous nature of these vehicle movements based on the number of HDV expected. The on-time correction was based on the prediction that a single HDV pass-by event lasts approximately 15 seconds, noting that overestimating the pass-by duration is more conservative.

Based upon the previous paragraphs, the construction noise levels for the peak month, typical month and Piling and Foundation Works stage have been calculated at NSRs. The predicted construction noise levels for each receptor are presented in Table 11.18. Noise level maps of predicted combined construction levels in the Piling and Foundation Works stage, typical and peak months can be found in Volume III:

- Figure 11.3a Typical Month
- Figure 11.3b Peak Month – Piling Location 1
- Figure 11.3c Peak Month – Piling Location 2
- Figure 11.3d Piling and Foundation Stage – Piling Location 1
- Figure 11.3e Piling and Foundation Stage – Piling Location 2

Table 11.18: Predicted Construction Noise Level at Receptors for Peak and Typical Month - Piling and Foundations work stage

Receptor	Constr. Month	Site Access Road Only $L_{Aeq,T}$ dB		Site Activities Only $L_{Aeq,T}$ dB	Predicted Combined Construction Noise Level $L_{Aeq,T}$ dB		
		12hr Weekday	6hr Saturday		12hr Weekday & 6hr Saturday	12hr Weekday	6hr Saturday
NSR1	Peak			67	67		67
	Piling	45	47	65	65		65
	Typical			63	64		64
NSR2	Peak			66	66		66
	Piling	32	34	63	63		63
	Typical			62	60		60
NSR3	Peak			56	56		56
	Piling	18	20	53	53		53
	Typical			53	52		52

Peak month is month 7 of construction programme. Peak month and 'Piling' stage both include contribution of piling at Location 1.

Table 11.18 indicates that the predicted typical construction levels, representing 28 months of a total of 29, is within the relevant BS5228.-1 Category A limits listed in Table 11.12 for weekdays and Saturday morning construction works. In the peak construction month NSR3 remains compliant; however at NSR1 and NSR2 the 65dB $L_{Aeq,T}$ threshold value is exceeded by 2dB and 1dB respectively. This exceedance during month 7 will only be realised if the construction plant contributing to the peak month operates at the quoted maximum sound power levels for the full quoted percentage on-times of the

proposed construction hours, see Table 11.14. The NRA Guidelines threshold value for Saturdays is also 65dB $L_{Aeq,T}$ and therefore NSR1 and NSR2 also exceed the Saturday NRA criteria, but all receptors are otherwise compliant with NRA Guidelines in the relevant weekday daytime period, which is 70dB $L_{Aeq,T}$.

On this basis **No Significant Adverse** effects are expected at any NSRs with regards construction phase noise levels generated by on-site activities with exception of NSR1 and NSR2 in the peak month (month 7). In accordance with Table 11.1 and Table 11.2 the impacts would be defined as **Not Significant** and **Short-Term** at all NSRs except at NSR1 and NSR2 in the peak month.

The exceedance (of BS5228-1 criteria) at NSR1 and NSR2 during the peak month is addressed in the Mitigation Measures section that follows however at worst unmitigated the significance of the adverse effect would be characterised as being **above Not Significant but lower than Slight** and would be **Short-Term**.

11.5.2 Construction Phase: Traffic on Public Roads

The predicted traffic flows on the surrounding road network with and without construction traffic are presented in Table 11.19 for the construction year 2026. The links are mapped in EIAR Volume II 11.2.

Table 11.19: Construction Phase Traffic

Link Number	Assumed Average Speed (km/h)	2026 without Construction Traffic		2026 with Construction Traffic	
		18hr AAWT	% HDV	18hr AAWT	% HDV
1	60	3215	6.1%	3243	6.0% **
2	60	4067	6.7%	4361	7.3%
3	50.8*	1298	10.3%	1620	11.0%
4	80	1102	8.5%	1424	9.6%

* This average speed was determined from measured data as it was available. Average speeds for all other links are based on the limit understood.
 ** this value reduces slightly as construction HDV are not expected to use this link

Calculations have been carried out in accordance with the *Basic Noise Level (BNL)* methodology presented in CRTN¹⁴ to determine the change in road traffic noise levels resulting from these changes in flows.

The results of these calculations alongside the associated magnitude of impact are presented in Table 11.20.

Table 11.20: Change in Road Traffic Noise Level Resulting from Construction Traffic

Link	Change in Noise Level (dB)	Magnitude of Impact
1	0.0	No Change
2	0.3	Negligible

¹⁴ Calculation of Road Traffic Noise (CRTN) methodology

Link	Change in Noise Level (dB)	Magnitude of Impact
3	1.5	Minor
4	1.8	Minor

Based upon the previous table, a **Negligible to Minor impact (Not Significant)** on existing road traffic noise levels is expected during the construction phase. In accordance with Table 11.1 and Table 11.2 these increases are defined as **Imperceptible** and **Short Term**.

11.5.3 Operational Phase: Site Operations

11.5.3.1 Criteria

The location of the Proposed Development does not meet the definition of a 'Quiet Area' and all night-time $L_{A90,T}$ values summarised in Table 11.10, are above 30dB, which according to NG4 section 4 step 3 excludes the Site from being classed as a 'Low Background Noise Area'. Furthermore, the current license for the Site requires that operations from the Site also meet the 'All other Areas' as summarised in Table 11.8. The following is reproduced from Condition 8 of EPA IPPC License Reg. 716¹⁵:

8.2 *Activities on-site shall not give rise to noise levels off-site, at noise sensitive locations, which exceed the following sound pressure limits (Leq, 30 minutes) subject to Condition 3 of this licence:*

8.2.1 *Daytime: 55dB(A),*

8.2.2 *Night-time: 45dB(A).*

8.3 *There shall be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise sensitive location.*

It is expected that these operational constraints will be retained in any future license review as the Proposed Development will not change the character of the current acoustic environment and there is no history of noise complaints from the NSRs. NG4 section 1.2 states:

"It is acknowledged that retention of the existing daytime and night-time periods and criteria may be appropriate in certain cases, for example, in situations where a site has been operating successfully for a significant period of time without any history of noise complaints."

The assessment therefore evaluates potential adverse impact from noise emissions against the 'All Other Areas' criteria in Table 11.8.

When in operation, the proposed OCGT could be operated at any time of the day or night for limited periods of time when other sources of electricity are unable to meet grid demand. Therefore, the noise criterion of 45dB $L_{Aeq,8hr}$ for the night-time at all NSR locations has been adopted. Compliance with this night-time criterion at the closest NSR will therefore ensure compliance with the higher criteria for daytime and evening periods.

¹⁵ EPA Revised License 716 - [090151b2805878af.pdf \(epa.ie\)](https://www.epa.ie/publications/default.aspx?category=27&id=1234)

11.5.3.2 Power Plant Proposed Equipment

The building construction and equipment details will be finalised later during procurement and detailed design in conjunction with the appointed equipment supplier. Any changes to the proposed equipment during detailed design will be within the parameters described and assessed in this EIAR.

Details of the noise generating mechanical plant associated with the Proposed Development have been provided by the Applicant. They are provided as predicted values for the equipment named and are detailed in Table 11.21 in terms of either sound pressure level (L_{pA}) at a defined distance from the plant item, or the sound power level (L_{wA}) emission from the plant item refer to EIAR Volume III Figure 11.1 for sources locations.

Table 11.21: Proposed Development Fixed Plant Noise Levels

	Item	ID	Sound Power Levels dB(A)									
			31.5	63	125	250	500	1k	2k	4k	8k	dBA
Gas Turbine Package*1	Air Inlet - Filter Face	S3	76	84	83	82	82	88	90	94	89	98
	Air Inlet – Ducting	S3	74	78	73	70	73	79	90	86	64	92
	Air Inlet – Plenum	S3	51	66	73	82	87	91	101	92	78	102
	Internal – Turbine Compartment	S1	78	93	97	93	93	95	98	96	88	104
	Internal – Lube Oil / Gas Module	S1	64	80	84	88	93	96	99	93	86	102
	Internal – GT Enclosure Fan Casing + Outlet Exhaust (x 2)	S1	62	75	93	91	94	94	94	98	93	103 (106)
	Internal – Enclosure Fan Casing + Outlet (x 2)	S1	63	77	93	92	95	95	92	91	86	101 (104)
	Internal – Generator Enclosure	S1	74	91	98	92	93	92	91	83	78	102
	Internal – GT Aux Transformer (-15dB during sinusoidal load)	S1	72	96	103	91	84	82	81	80	78	104
	Internal – BoP Aux Transformer (-15dB during sinusoidal load)	S1	47	58	73	81	86	89	91	87	79	95
GT Exhaust	Exhaust duct & Diverter damper	S2	80	89	95	98	97	91	90	80	69	103
	Internal – GT Exhaust Diffuser Compartment	S2	76	87	91	92	93	89	88	84	77	99
	Stack Top	S4	92	94	96	98	103	104	99	98	77	109
Balance of Plant (BOP)	Fin Fan Coolers	S6&7	-	86	95	102	107	107	104	100	92	112
	Grid Transformer	S8	104	101	116	99	95	82	78	73	70	101
	Unit Transformer	S8	99	98	96	86	79	79	74	67	59	85
Selective Catalytic Reduction (SCR)*2		S5	-	-	-	-	-	-	-	-	-	96

*¹ Gas Turbine package calculated as a cladded reverberant single area source using 0.8mm steel, air inlet modelled separately

*² SCR dBA calculated from client supplied maximum sound pressure level of 85 dB at 1m

11.5.3.3 Assessment

To determine the potential noise impact of the Proposed Development on the NSR locations identified, all of the noise sources identified have been included in the 3D CadnaA 2022 MR2 noise model.

The locations of the various noise sources were taken from Drawing: 60695232-TBT-DR-001 submitted with this application.

The following modelling approaches have been adopted:

- Ground absorption is assumed to be 'acoustically soft' as defined in *ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation*. Areas of water, the Proposed Development and roads assumed to be acoustically hard / reflective.
- All noise sources have been represented as omni-directional point sources with the exception of the stack body.
- The stack body has been represented as a cylindrical vertical building 55 m high building from ground. The stack body is assumed to not re-radiate noise. The stack outlet has been modelled as a point source at a height of 55.01 m above ground level and therefore just above the stack body.

Section 5 of *NG4* details the assessment of noise sources with tonal or impulsive elements and the appropriate penalties / corrections to apply where sources present these characteristics. In this instance, it is assumed that all sources can be designed such that they do not present tonal or impulsive characteristics at the location of nearby receptor positions as required by the current license as stated in 11.5.3.1. Therefore, no corrections have been applied.

The 3D noise model has been used to calculate operational phase noise levels at the NSR locations identified, as set out in

Table 11.222.

Table 11.22: Operational Sound Levels at Receptors - Unmitigated

Receptor	Receptor Height	All Items Predicted Level ($L_{Aeq,T}$)	Night-time Criterion ($L_{Aeq,8hr}$)	Compliant? (Y/ N)
Freefield Levels				
NSR1 (Single Storey)	1.5m	56	45dB	N
NSR2 (Double Storey*)	4.0m	44		Y
NSR3 (Double Storey*)	4.0m	36		Y

* Worst case assumption

The assessment indicates that unmitigated noise emissions from the Proposed Development complies with the 45dB $L_{Aeq,T}$ night-time criterion at NSR2 and NSR3. At NSR1 the 45dB $L_{Aeq,T}$ night-time criterion is exceeded by 11dB which would be considered significant depending on the context.

As NSR2 and NSR3 are compliant then in accordance with Table 11.1 and Table 11.2 the effects are considered **Not Significant** or better, **Long-Term** and **Reversible**. The exceedance at NSR1 is

considered in the Mitigation Measures Section 11.6 of this chapter. Otherwise a 10dB exceedance would be considered as Significant and that mitigation would be required.

11.5.4 Operational Phase: Traffic on Existing Roads

Relatively low numbers of vehicles on public roads are expected in relation to the operational phase of the Proposed Development when compared to the existing flows on surrounding roads (see Table 11.19 without construction traffic). “Relatively low” meaning the change in noise level due to the change in traffic flow would be imperceptible. On this basis in accordance with Table 11.1 and Table 11.2 the impacts will be **Not Significant** or better, **Long-Term** and **Reversible**.

11.5.5 Do Nothing Scenario

If the Proposed Development were to not go ahead, the **Temporary** and **Long-Term** noise sources associated with construction and operational phases would not be introduced into the area and the current acoustic environment would continue.

11.6 Mitigation Measures

11.6.1 Construction Phase

The assessment of construction noise detailed indicates no significant adverse effects at residential receptors with the exception of NSR1 during the peak month (month seven) where a 2dB exceedance is predicted over the BS5228-1 criteria.

BS5228-1 Table B.1 provides a generalised table of methods for reducing noise levels from construction plant; the reductions quoted are in the order of 5dB to 10dB for the various interventions/options. Therefore, through the selection of quieter construction plant and implementation of general mitigation measures comprising those in BS5228-1 Table B.1 the exceedance of the threshold value at NSR1 during month seven will be avoided.

Furthermore, to ensure noise levels are kept to a minimum and to reduce the risk of cumulative effects, it is recommended that the following will be implemented during the construction phase, as a minimum:

- Good community communication will be established and maintained throughout the construction process. This shall include informing residents on progress and ensuring measures are put in place to minimise noise and vibration impacts.
- Fixed and semi-fixed plant such as generators, compressors and pumps will be located away from sensitive receptors wherever possible.
- All plant used onsite will be regularly maintained, paying attention to the integrity of silencers and acoustic enclosures and any other components designed to reduce noise or components designed to reduce vibration.
- All noise and vibration generating construction plant will be shut down when not in use.
- The loading and unloading of materials will take place away from NSRs, ideally in locations which are acoustically screened.

- Materials will be handled with care and placed rather than dropped where possible. Drop heights of materials from lorries and other plant will be kept to a minimum.
- Modern plant will be selected which complies with the latest European Commission noise emission requirements i.e. The Outdoor Noise Directive 2000/14/EC (OND) which regulates the noise emissions into the environment by outdoor equipment. Electrical plant items (as opposed to diesel powered plant items) will be used wherever practicable. All major compressors will be low noise models fitted with properly lined and sealed acoustic covers. All ancillary pneumatic percussive tools will be fitted with mufflers or silencers of the type recommended by the manufacturers.
- Site operations and vehicle routes will be organised to minimise the need for reversing movements, and to take advantage of any natural acoustic screening present in the surrounding topography.
- No employees, subcontractors or persons employed on the Site will cause unnecessary noise from their activities e.g., excessive 'revving' of vehicle engines, music from radios, shouting and general behaviour etc. All staff inductions at the site will include information on minimising noise and reminding them to be considerate of the nearby residents.
- As far as practicable, noisier activities will be planned to take place during periods of the day which are less noise sensitive *i.e.*, not particularly early or late in the day.
- Measures will be put in place to ensure that employees know that minimisation of noise will be important at the Site.
- Construction traffic from this and other concurrent development will be coordinated to minimise traffic and site noise impacts where possible.

Any noise complaints received during the construction phase will be investigated thoroughly. The results of the investigation, including measured noise and vibration levels at the time of the complaint, on-site activities and any corrective action taken, will also be reported to relevant stakeholders.

The assessments in 11.5.1 and 11.5.2 will be revisited once the Contractor is appointed to confirm that no significant effects are expected, or where necessary, identify appropriate specific noise mitigation measures.

11.6.2 Operational Phase

A commitment is made to adopt the NG4 operational noise limits detailed in Table 11.8 for “All Other Areas” as requirements within the final design, including the need to address distinctive acoustic characteristics of tonality and impulsivity and application of best available techniques (BAT) at procurement and through detailed design stage as per the requirements of NG4 for licensed operations.

Application of BAT will include the selection of equipment that is a quieter alternative, uses quiet modes or can be readily fitted with acoustic interventions such as silencers, mufflers or attenuators all to reduce the sound emissions.

A commitment is also made to check compliance with the nominated criteria confirmed via long-term periodic noise level monitoring. i.e., yearly compliance monitoring in-line with the existing license conditions for the Site.

11.6.2.1 Mitigation Analysis

The assessment of operational activity in Section 11.5.3 has indicated that the unmitigated Proposed Development has the potential to exceed the NG4 assessment criteria in the night-time.

While the commitment has been made to apply BAT to reduce overall sound emission from the Site, it is still necessary to demonstrate a compliant operational design is possible when specific mitigation measures are implemented.

In order to determine where to focus acoustic mitigation it is necessary to first understand what parts of the operations contribute the most to predicted sound levels at sensitive receptors. An analysis of the predicted level contribution at NSR1 for the unmitigated scenario in Section 11.5.3 reveals the following sound sources are the biggest contributors:

- Gas Turbine Building Facades,
- Gas Turbine Building Air Intake; and
- Stack Outlet

Acoustic interventions on the stack outlet have the potential to affect the stack height for example and therefore a mitigation strategy that demonstrates feasibility and compliance is one that addresses only the Gas Turbine Building and Air Intake.

The minimum requirements for the mitigation strategy is described in detail here.

Minimum Requirements:

- 1) An acoustically rated louvre on the air intake that can achieve a 10dBA broadband insertion loss against the following unmitigated air intake spectrum:

Table 11.23: Reference Spectrum for Sound Power Level of Unmitigated Air Intake Components combined.

Octave Spectrum (dB)									BROADBAND dBA
31.5	63	125	250	500	1k	2k	4k	8k	
117	111	100	94	91	93	101	96	90	104

- 2) A Gas Turbine building wall and roof construction that can provide a total broadband insertion loss of **18dBA** against the following spectrum:

Table 11.24: Reference Spectrum for Sound Power Level of Reverberant Gas Turbine Building

Octave Spectrum (dB)									BROADBAND dBA
31.5	63	125	250	500	1k	2k	4k	8k	
127	129	127	118	115	112	111	110	106	119

11.6.2.2 Predicted Mitigated Sound Pressure Levels at NSRs

This section demonstrates how compliant levels can be achieved using real interventions that meet the minimum requirements in 11.6.2.1.

An example of meeting minimum requirement one is an air intake louvre with the following insertion loss. This was applied to the 3D sound propagation model and is based on manufacturer data.

Table 11.25: Louvre mitigation

	Octave Spectrum (dB)									BROADBAND REDUCTION*
	31.5	63	125	250	500	1k	2k	4k	8k	
Louvre A	0	3	3	5	7	10	12	11	11	10dBA

* against reference spectrum

An example of meeting minimum requirement two is by improving upon the unmitigated construction of the Gas Turbine building by increasing the thickness of the steel cladding from 0.6mm to 0.8mm, with the following insertion loss in each octave band. Note that any single material or composite cladding construction that meets the minimum requirement would be suitable from an acoustic standpoint.

Table 11.26: Improved Gas Turbine building cladding

	Octave Spectrum (dB)									BROADBAND REDUCTION *
	31.5	63	125	250	500	1k	2k	4k	8k	
0.6mm	8	8	10	14	19	24	29	34	34	16dBA
0.8mm	9	9	12	16	21	26	32	37	37	18dBA

* against reference spectrum

The predicted sound pressure levels at all receptors following the implementation of the example mitigation interventions is presented in Table 11.30. A noise level map of predicted operational levels can be found in EIAR Volume III Figure 11.4.

Table 11.27: Predicted Mitigated Sound Pressure Levels at NSRs for Example Interventions

Receptor	Receptor Height	All Items Predicted Level ($L_{Aeq,T}$)	Criterion ($L_{Aeq,T}$)	Compliant? (Y/ N)
Freefield Levels				
NSR1 (Single Storey)	1.5m	44	45dB	Y
NSR2 (Two Storey*)	4.0m	41		Y
NSR3 (Two Storey*)	4.0m	31		Y

* Worst case assumption

This demonstrates that when the minimum requirements for mitigation are met, the predicted levels are compliant at all NSRs. Louvre and cladding products with different insertion loss specifications can be used as long as they meet the minimum requirements set out in this section.

It is also worth noting some contextual factors which are:

- *BS8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings* provides guidance on recommended levels within bedrooms as being 30dB $L_{Aeq,8hr}$ during the night-time. It also states that a façade with an open window will provide approximately 15dB of sound attenuation. This means that levels would not be predicted to exceed 30dB $L_{Aeq,8hr}$ and therefore sleep disturbance due to operational activity is not expected.
- With windows shut it is highly likely that noise from the Proposed Development will be difficult to hear within bedrooms at NSR1. Following implementation of mitigation and with windows open, noise levels from the Proposed Development are predicted to meet the BS8233 criterion. It is noted that the BS8233 criterion is applicable to sources without specific character, which is considered appropriate in this context.
- NG4 makes significant reference to the application of Best Available Techniques (BAT). This assessment has identified where to focus and reduce noise emissions from the Proposed Development. The noise mitigation strategies currently proposed are an application of BAT.

Considering the operational numerical assessment against the NG4 'All Other Areas' criteria, adoption of mitigation and contextual factors, significant impacts are not expected with respect to operational noise emissions at nearby NSRs. In accordance with Table 11.1 and Table 11.2 the impacts would be defined as **Not Significant, Long-Term** but **Reversible**.

11.7 Residual Impacts

11.7.1 Construction Phase

Post mitigation, **No Significant** residual impacts are expected in the construction or decommissioning phases. A summary of this for each potential impact is provided in Table 11.28 and is relevant to both construction and decommissioning phases.

Table 11.28: A summary of the residual effects following the application of construction mitigation measures

Receptor	Sound Source	Impact Significance /Duration	Mitigation Measures (None/General/Specific)	Mitigation Description	Residual Impact Significance /Duration
NSR1	Site (Month 7)	Above Not Significant but lower than Slight & Temporary	General	Application of general measures to reduce noise levels, including quieter plant selection, those listed in BS 5228 Table B.1 and Section 11.6.1	Not Significant

Receptor	Sound Source	Impact Significance /Duration	Mitigation Measures (None/General/Specific)	Mitigation Description	Residual Impact Significance /Duration
	Site (Typical Month)	Not Significant & Short-Term	General		Not Significant
NSR2	Site	Not Significant & Short-Term	None	None required to be compliant however application of the general measures is best practice	Not Significant
NSR3	Site	Not Significant & Short-Term	None		Not Significant
General	Public Roads	Not Significant & Short-Term	None	None	Not Significant

11.7.2 Operational Phase

Following implementation of the minimum requirements for mitigation the top three contributors of noise at NSR1 is predicted to be:

- Stack Outlet
- Gas Turbine Building Facades, and
- Gas Turbine Building Air Intake;

However, post mitigation, **No Significant** residual impacts are expected. Any further reductions that can be obtained through procurement process (quieter plant), improved façade construction or other design details would also be considered as demonstration of the application of BAT. A summary of this for each potential impact is provided in Table 11.29.

Table 11.29: A summary of the residual effects following the application of operational mitigation

Receptor	Sound Source	Impact Significance /Duration	Mitigation Measures (None/General/Specific)	Mitigation Description	Residual Impact Significance /Duration
NSR1	Site	Significant & Long-Term but Reversible	Specific	Minimum specification provided for Gas Turbine Building wall/roof construction and gas turbine air intake louvre. See 11.6.2.1	Not Significant & Long-Term but Reversible
NSR2	Site	Not Significant & Long-Term but Reversible	None	None	Not Significant & Long-Term but Reversible
NSR3	Site	Not Significant & Long-Term but Reversible	None	None	Not Significant & Long-Term but Reversible

Receptor	Sound Source	Impact Significance /Duration	Mitigation Measures (None/General/Specific)	Mitigation Description	Residual Impact Significance /Duration
General	Public Roads	Not Significant & Short-Term but Reversible	None	None	Not Significant & Long-Term but Reversible

11.8 Cumulative Impacts

Table 4.2 in Chapter 4 provides a list of planning applications considered in relation to potential cumulative impacts. From a high-level review, cumulative impacts are not expected as a result of the construction or operational phases of the Proposed Development due to:

- construction phases not overlapping, or the listed developments being constructed already.
- operational traffic volume changes being low at either the listed development and the Proposed Development, or both, leading to negligible changes in road traffic noise levels on the surrounding road network; and
- the distance and / or nature of the development not being considered as likely to increase noise levels at nearby receptors.

The cumulative effects from the Temporary Emergency Generator (TEG) Development, SSE Battery Energy Storage Site Development and EirGrid Re-cabling Development are considered in further detail in the following sections.

11.8.1 The Temporary Emergency Generator (TEG) Development

The TEG development is located west of the NSR1 and immediately south-west of the Proposed Development, see EIAR Volume III Figure 4.2. The two developments share the same closest NSR namely NSR1 representing multiple residential dwellings.

The nature of the Temporary Emergency Generator (TEG) plant is that it can respond quickly when demand on the national grid is high. It is understood the TEG plant at the SSE Tarbert site is limited to maximum of 500 operational hours per year and that the facility has a limited life span of five years.

During the planning and environmental reporting stage the TEG plant was committed to be compliant with the 45dB $L_{Aeq,8hr}$ at NSR1. The predicted sound pressure level was 40dB $L_{Aeq,8hr}$ and the manufacturer's guaranteed level is 43dB $L_{Aeq,8hr}$.

Therefore for the purposes of a conservative cumulative assessment of the TEG plant and Proposed Development a worst case assumption is adopted that the TEG is predicted to be 43dB $L_{Aeq,T}$ at the Proposed Development nearest sensitive receptor (NSR) in the day and evening periods.

It is expected that the TEG will be in operation prior to the commencement of the Proposed Development construction.

11.8.1.1 Proposed Development during Construction with TEG Operating

Should the TEG be needed to meet demand during the construction phase in daytime of the Proposed Development, the noise level contribution from the TEG at NSRs would be at least 10dB below the day-time construction threshold value. This means that its contribution to the predicted construction noise levels at NSRs would be negligible and therefore the cumulative impact is not significant in this scenario.

11.8.1.2 Proposed Development and TEG Operating

The night-time period is excluded from the cumulative assessment on the basis that high electricity demand is not expected in the night-time period.

The cumulative worst case predicted sound pressure levels for all sensitive receptors are presented in Table 11.30:32 and compared to the relevant NG4 assessment criteria. As a conservative approach the level of the TEG at NSR2 and NSR3 is assumed to be the same as at NSR1, in practice it will be less due to the additional distance.

Table 11.30: Predicted Cumulative Sound Pressure Levels

Receptor	TEG or BESS Development Worst Case Noise Level ($L_{Aeq,T}$)	Proposed Development Predicted Level ($L_{Aeq,T}$)	Worst Case Cumulative Predicted Level ($L_{Aeq,T}$)	Day, Evening and Night Criterion ($L_{Aeq,T}$)	Compliant Day & Evening? (Y/ N)
NSR1	43	44	47	Day: 55 dB Evening: 50 dB (Night: 45 dB)	Y
NSR2	43*	41	45*		Y
NSR3	43*	31	43*		Y

* These levels will be less in practice as the receptors are much further away than NSR1

It is worth noting that should the predicted levels be compared against the night-time criteria there would be a 2dB exceedance at NSR1. However, this scenario is considered unlikely given that both Proposed Development and TEG will function during periods of high demand and hence their simultaneous operating at nighttime would be unlikely. Furthermore, according to NG4 section 4.4.1,

"In some instances, licensed sites will have certain items of emergency equipment (e.g., standby generators) that will only operate in urgent situations (e.g., grid power failure). Depending upon the context, it may be deemed permissible for such items of equipment to give rise to exceedances in the noise criteria/limits during limited testing and emergency operation only. If such equipment is in regular use for any purposes other than intermittent testing, it is subject to the standard limit values for the site."

This is taken to be applicable when considering the cumulative assessment of two or more developments that must meet the same operational noise limit at a shared NSR and one of them is designed to operate specifically in an emergency situation, as well as when considering the Proposed Development in isolation.

On this basis cumulative impact of the two developments is concluded to be negligible and not significant.

11.8.2 SSE Battery Energy Storage Site

The Battery Energy Storage Site (BESS) application was submitted in 2018 and the project was granted consent in 2019 (expires 2029) to be built on an area of approximately 2.278 hectares (ha) contained within the boundary of the existing power station, a 42ha site. It will also include a 33kV underground cable connection to the existing 110kV ESB substation to the southeast. This is the same area of land where the TEG is being constructed and therefore this development can only be constructed and completed if the TEG is decommissioned. The following subsection consider the cumulative impact of the BESS and Proposed Development during construction and operational phases as relevant. There are no cumulative effects relating traffic due to BESS site being unattended in normal conditions.

11.8.2.1 Proposed Development and BESS during construction

Operational levels from the Proposed Development are more than 10dB below the weekday daytime and Saturday morning BS5228-1 construction noise criteria. Therefore, the Proposed Developments contribution to cumulative levels during the BESS construction would be negligible and considered not significant.

11.8.2.2 Proposed Development and BESS during operation

The BESS application (document ref 19011-6005-C, April 2018) predicts a noise level of 43dBA in the day, evening, and night periods at NSR1 assuming it runs continuously within those periods. As this is the same level assumed for the TEG operation at NSR1, please also refer to Table 11.30 for the cumulative predicted levels from the BESS and Proposed Development combined.

On this basis a 2dB exceedance of the night-time criteria is predicted at NSR1 however when determining the significance of a likely effect from a potential impact it is important to consider a range of factors, as suggested by the EPA 2022 Guidelines see section 11.3.3, in this instance the understanding the “Extent and Context” as well as the “Magnitude” (+2 dB) of the exceedance is particularly important.

Contextual considerations for the night-time exceedance caused by the BESS and Proposed Development combined

The first contextual factors relate to the Proposed Development operation:

- The Proposed Development function is a peaking power plant where it functions when there is a high demand for electricity for example in the morning (typically between 07.00 - 09.00) and in the evening (typically between 17.00 - 20.00). Therefore, there is a low likelihood of the Proposed Development operating at maximum capacity and emitting the full predicted 44dBA through-out all of the night-time period. For example, if the Proposed Development was to operate for 2 hours at maximum output 44 dBA in the night-time period prior to the morning peak (0500 to 0700), the resulting night-time 8-hour level would be determined using an on-time correction of -6dB from $(10 \cdot \log_{10}(2h/8h)) = -6 \text{ dB}$. Therefore the predicted night-time level would instead be $44 - 6 = 38\text{dB } L_{Aeq,8h}$ for the Proposed Development. When this is combined with the conservative BESS level of 43dBA $L_{Aeq,8hr}$, the cumulative level drops from 47dB $L_{Aeq,8hr}$ to 44dB $L_{Aeq,8hr}$ which is compliant.

- Operating at full capacity throughout the 8-hour night-time if required would likely be considered an emergency and the NG4 section 4.4.1 statement about permissible exceedances would apply.
- A commitment is made in section 11.6.2 that BAT will be applied in the procurement process and detailed design stage to reduce predicted noise levels at receptors further where it is practical to do so. This means that noise levels are likely to be lower than those predicted in this assessment and as such the exceedance will be less than 2 dB or avoided altogether.

The magnitude of the exceedance is important to consider as well.

- A difference of 3dB is considered to be just noticeable to the human ear in everyday listening conditions and therefore from a perceptual perspective there is no clear notable difference in a predicted operational noise level of 45dBA compared to 47dBA - the difference is Imperceptible per the EPA 2022 Guideline terminology. This also means that with respect to potential annoyance, disturbance and health effects, there is no major concern to attribute to the 2dB exceedance and the magnitude of impact at the receptor is no different between 45dBA which is compliant with the NG4 licensing criteria and 47dBA which exceeds it in the night-time.

The extent, duration and prevalence of BESS operational noise are also important factors to consider when determining the overall significance of effect to attribute to the cumulative operational noise. A number of relevant contextual factors relating specifically to BESS operations follow:

- The BESS operation will primarily respond to Grid energy demands, which typically peak in the mornings (07:00 - 09:00) and evenings (17:00 - 20:00), especially during colder months. However, the need for cooling decreases in these months. The cooling fans for the proposed batteries, are designed to work in ambient temperatures between -15 and +45 degrees Celsius. This means they will not often operate at full power due to the prevailing ambient temperatures in the locale, especially at night.
- While the BESS site is assumed to emit noise 24/7, in practice, its noise emissions will be less frequent and would therefore be less than predicted in the application, especially at night, since cooling requirements are lower. The on-time discussed previously for the Proposed Development is relevant to the BESS as well.
- Within the consented 2018 BESS application, at section 9.1.2, it was stated that,

“Based on indicative available equipment sound power data, there is the potential to marginally exceed the EPA night-time limit of 45dB cumulatively with existing operations. To prevent and mitigate this, the final layout and equipment selection will be optimised to minimise noise emissions and ensure they are below EPA limits.”

This means that the potential to exceed night-time limits when the Power Station and BESS operations are combined was highlighted in 2018 application (later consented) and that the same Applicant has stated they will ensure cumulative noise levels are below the limits through choice of BESS layout and BESS equipment selection.

- It will be approximately 10 or more years since the application was written and procurement process begins, and it is likely that the BESS technology and markets will have developed considerably in that time. This means that the market should be able to offer a wider range of inherently quieter equipment or modes than the units originally used in the assessment.

Finally, comparing the predicted sound level against the background sound level is another common method to assessing the significance of effects in addition to assessing the absolute level. This method is presented in BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*. A rating level is compared to the background sound level and the difference can be used to quantitatively assess significance depending on the context. In this case, the rating level is the predicted level of the Proposed Development corrected for tonality, impulsivity and intermittency characteristics as perceived at the assessment location. NG4 states that tonality and impulsivity characteristics must not be audible at the receptor at night-time and as such the cumulative rating level of the Proposed Development is equal to the predicted cumulative level, 47 dB $L_{Aeq,8h}$ at NSR1, see Table 11.30.

The reported background sound level at NSR1 was reported in the BESS application as 42dB $L_{A90,8hr}$ as presented in 11.4.2 of this chapter. The more recent but much shorter duration measurements help to support that sound levels in the area have remained similar from year to year.

Subtracting the representative night-time background sound level from the established rating level gives a result of 5dB over the background sound level.

A difference of about 10dB or more is likely to be an indication of a significant adverse impact, depending on the context, whereas a difference of around 5dB is likely to be an indication of an adverse impact, depending on the context.

Summary of Contextual Considerations

In summary, actual noise levels at NSR1 are expected to be lower than that predicted in the assessment when considering both the BESS and Proposed Development individually and combined. A range of reasons why cumulative levels will be lower in practice have been presented and why the exceedance would be unlikely to cause disturbance if it did occur was explained.

It was also explained that the Applicant has previously committed to, “*ensure [cumulative levels] are below EPA limits*” as part of the consented BESS application which also predicted a cumulative exceedance.

Therefore, considering all of the contextual factors together it is determined that the cumulative impacts from the combined Proposed Development and BESS operational noise emissions are **Not Significant, Long Term and Reversible**.

11.8.3 EirGrid re-cabling Development

The Tarbert 220kV Circuit across the Shannon Estuary is planned for an upgrade. The existing 220kV cables within submarine pipes, linking the Tarbert Generating Station to the Kilkerin Point LCIM compound, will be replaced. Both substations will see decommissioning of certain equipment and the introduction of new layouts. A new fibre optic cable duct route will also be established, running parallel

to the 220 kV cables within the subsea pipes, connecting Kilkerin Point to the substation through various townlands. Subject to approvals, construction aims to commence in Q3 2024 and finish by Q4 2025.

Construction activities at Tarbert and Kilkerin Point are expected to last between 8 to 10 months. Concurrently, the work related to the fibre optic cable duct route is projected to span 36 to 40 weeks.

The documents currently available on planning portal do not provide any quantitative assessment of predicted construction noise levels and therefore a quantitative assessment is not possible. However, given the gradually moving nature of the works the overall contribution to predicted levels from the construction phase of the Proposed Development at NSRs it is considered not significant and will be of limited duration from the perspective of NSR1, including when the TEG or BESS is operating.

11.8.4 Cumulative Impacts Summary

No Significant cumulative impacts are expected to arise from the Proposed Development, either during the construction/decommissioning or operational phases (with mitigation in place as in 11.6.1 and 11.6.2 respectively), for the following reasons:

- Construction noise levels are not predicted to exceed the defined limits and therefore no significant adverse residual impacts from construction noise have been predicted at NSRs within the vicinity of the Proposed Development; and
- Day time and evening cumulative operational levels are sufficiently below the NG4 criteria for those periods.
- The Proposed Development is not expected to generate significant traffic during its operational phase.
- While potential cumulative exceedances were identified in the night-time period for the TEG and BESS:
 - The exceedance is small (2dB) and predicted levels are based on conservative operational assumptions, such as the need to operate at maximum capacity at night and with maximum cooling requirements despite that ambient temperatures are already favourably low.
 - The Proposed Development is expected to reduce operational noise below those predicted through the application of BAT at procurement and detailed design stage.
 - The TEG operation responds to high demand for electricity and is less likely to run at maximum capacity at night-time. The predicted exceedance is based on the TEG operating at the manufacturer guaranteed level, rather than the manufacturers predicted level at NSR1 which was 3dB lower. Furthermore, NG4 section 4.4.1 also refers to permissible exceedances in emergency conditions.
 - The applicant has previously stated with respect to cumulative levels from the BESS to “*ensure they are below EPA limits*” through optimisation of “*final layout and equipment selection*”.

11.9 Summary

The Proposed Development has been assessed with regard to the following areas:

- Short-term impacts during the construction and decommissioning phase, including:
 - Noise generated by onsite construction activities; and
 - Noise generated by changes to traffic flows on existing roads.
- Long-term impacts during the operational phase, including:
 - Noise generated by the Proposed Development once complete; and
 - Noise generated by changes to traffic flows on existing roads.
- Cumulative impacts including the Proposed Development and:
 - The Temporary Emergency Generator (TEG);
 - SSE Battery Energy Storage Site (BESS); and
 - EirGrid re-cabling Development

Vibration effects were scoped out of the assessment as the intervening distance was considered large enough for vibration impacts not to be significant.

The assessment of construction noise detailed indicates no significant adverse effects at residential receptors with the exception of NSR1 during the peak month (month seven) where a 2dB exceedance is predicted. Mitigation measures were proposed for the construction/decommissioning in section 11.6.1 to address the exceedance. BS5228-1 Table B.1 provides a generalised table of methods for reducing noise levels from construction plant; the reductions quoted are in the order of 5dB to 10dB for the various interventions/options. Therefore, it is feasible that through the selection of quieter construction plant and implementation of general mitigation measures comprising those in BS5228-1 Table B.1 the exceedance of the threshold value at NSR1 during month seven will be avoided.

Subject to the adoption of the mitigation measures detailed in this chapter, all effects are defined in accordance with Table 11.1 and Table 11.2 as either **Imperceptible** or **Not Significant**. Construction effects are defined as **Temporary / Short-Term**, whilst operational effects will be **Long-Term**, although all would be **Reversible**.

11.10 References

- BSI Group (2003). *BS 7445-1:2003 Description and measurement of environmental noise. Guide to quantities and procedures*
- BSI Group (2014) BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*.
- BSI Group (2014). *BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Noise'*.
- BSI Group (2014). *BS 5228-2:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Vibration'*.
- BSI Group (2014). *BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings*.
- Department of Transport, Welsh Office (1988). *Calculation of Road Traffic Noise*.
- Noise Advisory Council (NAC) 'A Guide to Measurement and Prediction of the Equivalent Continuous Sound Level L_{eq} '
- Environmental Protection Agency (EPA) (2016). *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities*.
- Environmental Protection Agency (EPA) (2022). *Guidelines on the Information to be contained in Environmental Impacts Assessment Reports*.
- European Parliament, Council of the European Union (2014). *EU Directive 2014/52/EU*.
- Highways England (2020). *Design Manual for Roads and Bridges (DMRB) LA111 Noise and vibration*.
- International Standards Organisation (1996). *ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation*.
- National Roads Authority (NRA) (2004). *Guidelines for the Treatment of Noise and Vibration in National Road Schemes*.
- ISO 9613-2 *ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation*

SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 12 Water Environment

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Table of Contents

12.	Water Environment	12-1
12.1	Introduction	12-1
12.2	Legislation, Policy, and Guidance	12-2
12.3	Methodology	12-4
12.4	Baseline Environment	12-10
12.5	Potential Impacts	12-24
12.6	Mitigation Measures	12-34
12.7	Residual Impacts	12-41
12.8	Cumulative Impacts	12-42
12.9	Summary	12-43
12.10	References	12-44

Plates

Plate 12.1: Source-Pathway-Receptor model

Plate 12.2: Rainfall data for Tarbert area (Source; Met Eireann, 2023)

Tables

Table 12.1:	Receptor sensitivity/ importance	12-7
Table 12.2:	Magnitude of impact rating (NRA, 2009)	12-9
Table 12.3:	Effect significance ratings (NRA, 2009)	12-10
Table 12.4:	WFD surface waterbodies	12-12
Table 12.5:	EPA latest river Q values	12-13
Table 12.6:	EPA Hydrotool river flow estimates	12-13
Table 12.5:	Summary of monitoring boreholes across SSE Tarbert Site	12-18
Table 12.6:	Summary of groundwater abstractions within 2km	12-19
Table 12.7:	Summary of water environment receptors and baseline condition	12-21
Table 12.8:	Potential Construction Impacts and Effects (where impact pathways exist)	12-28
Table 12.9:	Potential Operation Impacts and Effects (where impact pathways exist)	12-33

Appendix

(Refer to EIAR Volume II)

Appendix 12A: Flood Risk Assessment

Appendix 12B: Surface Water Drainage Strategy

Appendix 12C: WFD Screening Assessment

Figures

(Refer to EIAR Volume III)

Figure 12.1: Surface water features

Figure 12.2: Aquifer designations and groundwater features

Figure 12.3: Groundwater vulnerability

12. Water Environment

12.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) presents an assessment of the impacts of the Proposed Development upon the water environment.

This chapter defines the study area, the methodology used for developing the baseline and impact assessment, provides a description of the baseline environment in relation to water, and presents the findings of the impact assessment on water quality, hydrology, hydrogeology, hydromorphology, flood risk and water resources, as well as how these changes could impact on any water dependent ecosystems, such as wetlands.

The assessment considers the potential for non-conformance with the European Union (EU) Water Framework Directive (WFD), *Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for the Community action in the field of water policy* objectives and ensures that:

- the need for the avoidance and reduction of impacts on the water environment is taken fully into account in the environmental evaluation; and
- the selection of appropriate means of preventing significant predicted impact is made through modification of the drainage design, choice of discharge location(s) and/or adoption of run-off treatment methods, with the objective of designing-out potential adverse environmental impacts.

The Proposed Development ('red line boundary') lies within the boundary of the SSE Tarbert Site ('SSE Tarbert') under the management of the Applicant.

Full details on the background and Site history are provided in EIAR Volume I Chapter 4 (Existing Site and Conditions), and details of the Proposed Development is provided in EIAR Volume I Chapter 5 (Description of the Proposed Development), and the Planning Statement submitted with this planning application.

This chapter should also be read in conjunction with Chapter 7 (Air Quality), Chapter 9 (Biodiversity), Chapter 13 (Land and Soils), Chapter 16 (Material Assets) and Chapter 17 (Climate) of EIAR Volume I, which pay particular attention to the potential for impacts upon the aquatic / riparian environment, hydrogeological environment, deposition of particles from emissions, flood risk due to climate change, and water usage respectively.

12.2 Legislation, Policy, and Guidance

12.2.1 Legislation

The following European legislation and transposing Irish regulations are of relevance to this water environment assessment and the Proposed Development:

- European Union Water Framework Directive (WFD) (2000/60/EC). The following legislation in Ireland governs the shape of the WFD characterisation, monitoring and status assessment programmes in terms of monitoring different water categories, determining the quality elements and undertaking characterisation and classification assessments.
- European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003).
- European Union (Water Policy) Regulations, 2014 (S.I. No. 350 of 2014).
- European Union (Water Policy) (Abstractions Registration) Regulations, 2018 (S.I. No. 261 of 2018).
- European Communities (Drinking Water) Regulations 2014 (S.I. 122 of 2014)
- European Communities Environmental Objectives (Surface Water) Regulations, 2009 ('S.I. No. 272 of 2009 as amended'), as amended in 2012 (by S.I. No. 327/2012), 2015 (by S.I. No. 386/2015) and 2019 (by S.I. No. 77/2019).
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010 as amended), as amended in 2016 (S.I. No. 366 of 2016).
- European Union Environmental Impact Assessment (EIA) Directive 2011/92/EU as amended by 2014/52/EU.
- European Union (Planning and Development) (Environmental Impact Assessment) Regulations S.I. No. 419 of 2012, as amended by S.I. No. 543 of 2014, 2018 (S.I. No. 296 of 2018), as amended by S.I. No. 404 of 2018 and S.I. No. 646 of 2018.
- The EU Floods Directive 2007/60/EC.
- European Communities (Assessment and Management of Flood Risks) Regulations, 2010 (S.I. No. 122 of 2010).
- European Union (Environmental Impact Assessment) (Flood Risk) Regulations 2012 (S.I. No. 470 of 2012).

12.2.2 Policy

The Kerry County Development Plan (Kerry CDP) 2022-2028, prepared in accordance with the provisions of the Planning and Development Act 2000 (as amended), sets out a range of proposed policy objectives for development up to 2028 (Kerry County Council, 2022). The Kerry CDP incorporates the mandatory objectives listed in the Act, including conservation and protection of the environment and promotion of compliance with environmental standard, including but not limited to the following:

- KCDP 11-15: Facilitate and support the protection and enhancement of wetlands as nature-based solutions to flood management, climate change, and the biodiversity crisis.
- KCDP 13-1: Ensure compliance with the Water Framework Directive.
- KCDP 13-2: Achieve water quality targets by implementing the national River Basin Management Plan (and associated programmes of measures).
- KCDP 13-5: Ensure that planning applications are assessed with regard to the Groundwater Protection Scheme and the potential impacts the development may have on groundwater quality.
- KCDP 13-6: Protect all sources and potential sources of public water supply, including their zones of contribution within the County from pollution resulting from any development and/or land use.
- KCDP 13-7: Protect existing and potential water resources for the county, in accordance with the EU Water Framework Directive (2000/60/EC), the current National River Basin Management Plan and any amending or replacement version, the Pollution Reduction Programmes for designated shellfish waters, the provisions of the Groundwater Protection Scheme for the county and any other protection plans for water supply sources, with an aim to improving all water quality.
- KCDP 13-18: Ensure that development proposals comply with the standards and requirements of the Irish Water: Code of Practice for Wastewater Infrastructure, (December 2016), and any updated version of this document during the lifetime of the Plan.
- KCDP 13-24: Support the incorporation of Sustainable Urban Drainage Systems (SUDs) in all public and private development in urban areas.

12.2.3 Guidance

The following guidance documents are of relevance to the Proposed Development and were adhered to in the preparation of this water environment assessment:

- Department of Housing, Local Government and Heritage, 2018. *River Basin Management Plan 2018-2021*.
- Environmental Protection Agency (EPA), 2022. *Guidelines on the Information to be contained in Environmental Impact Assessment Reports*.
- EPA, 2003. *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements*.
- EPA, 2013. *Management of Contaminated Land and Groundwater at EPA Licensed Sites*.
- National Road Authority (NRA), 2009. *Guidelines on Procedures for Assessment Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*.
- Institute of Geologists of Ireland (IGI), 2013. *Guidelines for Preparation of Soils, Geology, Hydrogeology Chapters of Environmental Impact Statements*.
- Department of housing, Local Government and Heritage (DHLGH) 2009, *The Planning System and Flood Risk Management – Guidelines for Planning Authorities*.

12.3 Methodology

12.3.1 Introduction

The following sources of information that define the Proposed Development form the basis of this assessment:

- EIAR Volume I Chapter 4: Existing Site and Conditions.
- EIAR Volume I Chapter 5: Description of the Proposed Development.
- EIAR Volume III Figures 12.1 – 12.3.
- EIAR Volume II Appendix 12A: Flood Risk Assessment for the Site; and
- EIAR Volume II Appendix 12B: Surface Water Drainage Strategy.

12.3.2 Study Area

The study area for water receptors encompasses the entire area within the Site, and water features within a 2km radius. The study area is considered appropriate to identify water environment receptors that could reasonably be affected and to take account of potentially significant impacts which could arise a greater distance away, i.e., groundwater dependent designated sites, which could be hydraulically connected over an extended distance to groundwater beneath the Site (NRA, 2009).

12.3.3 Determination of the Baseline Environment

The baseline water environment within the study area for water receptors has been determined from desktop review and site studies / investigations, as follows:

- Ordnance Survey Ireland (OSI) website for historical maps of 1:2,500 scale and 1:10,560 scale and aerial photographs.
- OSI Discovery series of 1:50,000 scale.
- Geological Survey of Ireland (GSI) online map viewer www.gsi.ie/mapping [accessed October 2023].
- EPA Maps online map viewer, <https://gis.epa.ie/EPAMaps/> [accessed October 2023].
- EPA Catchments online map viewer, www.catchments.ie [accessed October 2023].
- EPA Hydronet online map viewer, <https://epawebapp.epa.ie/hydronet/> [accessed October 2023].
- National Parks and Wildlife Service (NPWS) designated sites and protected areas online map viewer, www.npws.ie/mapping [accessed October 2023].
- Wetland Surveys Ireland wetland inventory online map viewer, www.wetlandsurveys.ie [accessed October 2023].
- GeoHive historic maps online map viewer, <https://webapps.geohive.ie/mapviewer/index.html> [accessed October 2023].
- Fluvial and Coastal Flood information mapping from the Catchment Flood Risk Assessment and Management Program (CFRAM) (OPW, 2023), <https://www.floodinfo.ie> [accessed October 2023].
- Causeway Geotech Limited, 2022. *Site investigation*.
- URS, 2009. *Environmental Site Assessment ESB Generating Station, Tarbert, Co. Kerry* Ref: 49341640 Final Issue No 4 dated 6 November 2009.
- AECOM, 2022. *Heavy Fuel Oil Spill Response - Tarbert Generating Station - Soil Sampling*. Ref: 60673806_ACM_EN_RP_003 dated 30 June 2022.
- AECOM, 2023a. *T-4 Site Investigation - Tarbert Generating Station*, ref: 60707258_ACM_RP_EN_0 dated 01 September 2023, for SSE Generation Ireland Limited.

- AECOM, 2021. Groundwater Monitoring Report, March 2022.
- AECOM, 2022. Groundwater Monitoring Report.

In addition, a site-specific Flood Risk Assessment (FRA) has been prepared for the Proposed Development and is submitted with this planning application, refer to EIAR Volume II Appendix 12A.

12.3.4 Impact Assessment Methodology

A qualitative assessment of the likely significant effects on the water environment has been undertaken, using the source-pathway-receptor approach. For an impact on the water environment to exist, the following is required:

- An impact source (such as the release of polluting chemicals, particulate matter, or biological materials that cause harm or discomfort to humans or other living organisms, or the loss or damage to all or part of a water body);
- A receptor that is sensitive to that impact (i.e., water bodies and the services they support); and
- A pathway by which the two are linked.

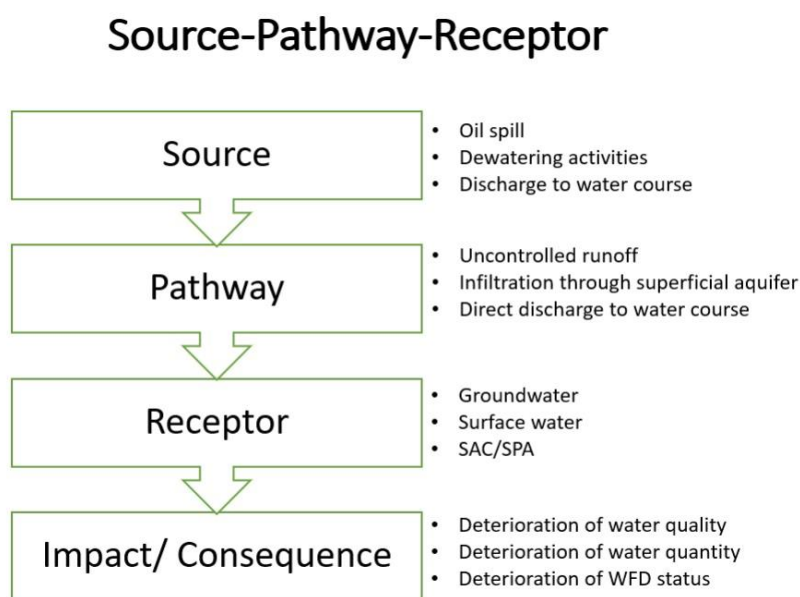


Plate 12.1: Source-Pathway-Receptor model

The first stage in applying the Source-Pathway-Receptor model is to identify the causes or 'sources' of potential impact from a proposed development. The sources have been identified through a review of the details of the Proposed Development, including the size and nature of the development, proposed construction methodologies and timescales. The next step in the model is to undertake a review of the potential receptors, that is, the water environment receptors that have the potential to be affected.

The last stage of the model is, therefore, to determine if there is a viable exposure pathway or a 'mechanism' linking the source to the receptor. This has been undertaken in the context of local

conditions relative to the water receptors within the study area, such as topography, geology, climatic conditions and the nature of the impact (e.g., the mobility of a liquid pollutant or the proximity to works that may physically impact a water body).

The assessment of the likely significant effects is qualitative and considers construction, operational and decommissioning phases, as well as cumulative effects with other developments. This assessment has considered the risk of pollution to surface water bodies and groundwater directly and indirectly from construction activities, particularly in relation to those water features which are within or close to the Site. The risk of pollution from runoff from the built environment has also been considered so that appropriate measures can be incorporated into the design of the Proposed Development.

12.3.5 Flood Risk Assessment

A Flood Risk Assessment is provided in Appendix 12A (refer to EIAR Volume II) which assesses flood risk for the Site. Refer to the Flood Risk and Drainage Assessment for a full description of the flood risk baseline, which is also summarised in Section 12.4 of this chapter.

12.3.6 Determination of Sensitive Receptors

When undertaking the impact assessment following the source-pathway-receptor process, the following has been considered:

- Considering the existing (baseline) status of the water environment within the Site and relevant surrounds with respect to surface water, groundwater and flood risk;
- Identifying likely impacts of the Proposed Development on the water environment during the operational, construction and decommissioning phases, based on a source-pathway-receptor approach.
- Proposing suitable mitigation measures to be incorporated into the development design, construction and operation to offset any adverse impacts (i.e., embedded mitigation).
- Reviewing any residual impacts and presenting additional mitigation measures to limit their impacts should these be required.

A qualitative assessment has been used to assign a sensitivity rating from negligible to high, based on the EPA's EIAR guidance (EPA, 2022), and considers their likely adaptability, tolerance, and recoverability, as well as their designation. In the absence of specific criteria for rating sensitivity in the 2022 EIAR guidance, the criteria from the NRA's *Guidelines on Procedures for Assessment Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (NRA, 2009) have been used and are presented in Table 12.1.

Table 12.1: Receptor sensitivity/ importance

Sensitivity/ importance	Description	Example
Extremely High	Attribute has a high quality or value on international scale or protected by EU legislation	River, groundwater body, Surface Water Dependent Ecosystem (SWDE) or Groundwater Dependent Terrestrial Ecosystems (GWDTE) of Special Area of Conservation (SAC) or Special Protection Area (SPA) status

Sensitivity/ importance	Description	Example
Very High	Attribute has a high quality or value on regional or national scale	River, groundwater body, SWDE or GWDTE of Natural Heritage Area (NHA) status, regionally important aquifer or public water supply, active continuous hydrometric station, Quality Class A (Biotic Index Q4, Q5)
High	Attribute has a high quality or value on local scale	SWDE or GWDTE of county importance, locally important aquifer or potable water supply, Quality Class B (Biotic Index Q3-4)
Medium	Attribute has a medium quality or value on local scale	SWDE or GWDTE of local importance, local potable water supply, Quality Class C (Biotic Index Q3, Q2-3)
Low	Attribute has a low quality or value on a local scale	Local water supply used for domestic/ agricultural purposes, Quality Class D (Biotic Index Q2, Q1)

12.3.7 Magnitude of Impact

The magnitude of impact has been assigned based on the EPA 2022 EIAR guidance, taking into account the likelihood of the effect occurring. The likelihood of an effect occurring is based on a scale of certain, likely or unlikely. Likelihood has been considered in the case of the assessment of potential impacts to water bodies only, as likelihood is inherently included within the FRA. In the absence of specific criteria for description of magnitude of impact in the 2022 EIAR guidance, the criteria from Box 5.2 and Box 5.3 of NRA's *Guidelines on Procedures for Assessment Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (NRA, 2009) has been used and are presented in Table 12.2. It should be noted the control measures, as outlined in Chapter 5 (Description of the Proposed Development), have been considered embedded in the project design and their application has been assumed in determining the significance of the impact. Mitigation measures will be devised for each potential complete pollutant linkage (comprising a source, pathway and receptor), no matter how significant the impact. Additional mitigation measures have then been considered prior to determination of residual impacts.

Table 12.2: Magnitude of impact rating (NRA, 2009)

Impact Level	Description:	Typical example
Large adverse	Results in loss of attribute and/ or quality and integrity of attribute	Hydrogeology • Removal of large proportion of aquifer • Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems. • Potential high risk of pollution to groundwater from routine runoff • Calculated risk of serious pollution incident >2% annually Hydrology • Loss or extensive change to a waterbody or water dependent habitat • Increase in predicted peak flood level >100mm. • Extensive loss of fishery • Calculated risk of serious pollution incident >2% annually • Extensive reduction in amenity value
Moderate adverse	Results in impact on integrity of attribute or loss of part of attribute	Hydrogeology • Removal of moderate proportion of aquifer • Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems. • Potential medium risk of pollution to groundwater from routine runoff • Calculated risk of serious pollution incident >1% annually Hydrology • Increase in predicted peak flood level >50 mm. • Partial loss of fishery • Calculated risk of serious pollution incident >1% annually • Partial reduction in amenity value
Small adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Hydrogeology • Removal of small proportion of aquifer • Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems. • Potential low risk of pollution to groundwater from routine runoff • Calculated risk of serious pollution incident >0.5% annually Hydrology • Increase in predicted peak flood level >10 mm. • Minor loss of fishery • Calculated risk of serious pollution incident >0.5% annually • Slight reduction in amenity value
Imperceptible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Hydrogeology • Calculated risk of serious pollution incident <0.5% annually Hydrology • Negligible change in predicted peak flood level. • Calculated risk of serious pollution incident <0.5% annually

12.3.8 Describing Potential Effects

The methodology used for describing the potential impacts considers the “quality” of the impacts (*i.e.*, whether it is adverse or beneficial), the “probability” of the event occurring and the “duration” of the impacts (*i.e.*, whether it is short or long-term) and a rating of negligible to high, as per the EPA Guidelines¹. The description or magnitude of impact (Table 12.2) is then combined with the sensitivity rating of the receptor (Table 12.1) to determine the significance of the potential effect (see Table 12.3).

Table 12.3: Effect significance ratings (NRA, 2009)

Sensitivity/ Importance of Attribute	Magnitude of Impact				
		Negligible	Small	Moderate	Large
	Extremely High	Imperceptible	Significant	Profound	Profound
	Very High	Imperceptible	Significant / Moderate	Profound / Significant	Profound
	High	Imperceptible	Moderate / Slight	Significant / Moderate	Severe (Very significant) / Significant
	Medium	Imperceptible	Slight	Moderate	Significant
	Low	Imperceptible	Imperceptible	Slight	Slight / Moderate

12.3.9 Limitations and General Assumptions

The assessment has been based on the description of the Proposed Development detailed within EIAR Volume I Chapter 5 (The Description of the Proposed Development).

Assumptions and limitations relating to flood risk are outlined in the Flood Risk Assessment (refer to EIAR Volume II, Appendix 12A).

Ground investigations have been undertaken at the Site and immediate surrounding area, and the details are presented in EIAR Volume I Chapter 13: Land and Soils, and in EIAR Volume II Appendix 13B Site Investigation Report (GQRA).

While Construction Method Statements will be prepared by the Contractor when appointed, all works will take place using best practice, in accordance with the Construction Environmental Management Plan (CEMP) (refer to EIAR Volume II Appendix 5A).

12.4 Baseline Environment

12.4.1 Land Use, Topography and Rainfall

The existing Tarbert HFO Power Station is positioned on Tarbert Island located approximately 1.8km north of the town of Tarbert in County (Co.) Kerry. The Proposed Development, which consists of an Open Cycle Gas Turbine (OCGT) power plant, administration building and workshop, ancillary plant, site works, services, grid connection and demolition of ancillary buildings associated with the existing Tarbert Heavy Fuel Oil (HFO) Power Station on land within the SSE Tarbert Site, will be located within the SSE Tarbert Site.

¹ EPA (2022).

The Proposed Development Site is located predominantly on brownfield land, and where there are existing structures, such as ancillary buildings/ structures associated with the existing Tarbert HFO Power Station, the works will include the demolition and removal of these structures. Hydrotreated Vegetable Oil (HVO) will be delivered to Site via tanker.

The topography of most of Tarbert Island is generally flat and lies at an elevation of 3m to 5m above Ordnance Datum (AOD), with the exception of the water reservoir. This structure is located to the south-east of the Site and is elevated above the remainder of the island by approximately 5m. On the mainland, to the south-west of the Site, the topography rises to around 62mAOD near Kilpadogue.

The surrounding land use is characterised by very sparsely populated farmland with one-off residential properties and farmhouses. Refer to EIAR Volume I Chapter 13: Land and Soils for more detail.

The closest Met Éireann weather observing station to the Site with available historical data is located at Tarbert (Kilpadogue) (Station No. 7111), at approximately 2.3km to the south-west. This station has been operational since 2021. The next closest is Ballyhahill (Glenbawn) (Station No.6311) at Glenbawn located 13km south-east of the Site and which has been operational since 2000. Plate 12.2 shows the available long-term average monthly rainfall data for 2000-2020 from Ballyhahill (Glenbawn) and average wet days per month and also the 2022 monthly rainfall for Tarbert weather station. The long-term average (LTA) annual rainfall (2000-2020) is 1,498.7mm. According to Met Éireann, most of the eastern half of the country gets between 750 and 1,000mm of rainfall in a year, while rainfall in the west generally averages between 1,000 and 1,400mm. The LTA annual rainfall for Ballyhahill is therefore just above the range for the west. The datasets show that monthly rainfall is generally lower in the spring months and wetter in the summer/ autumn months.

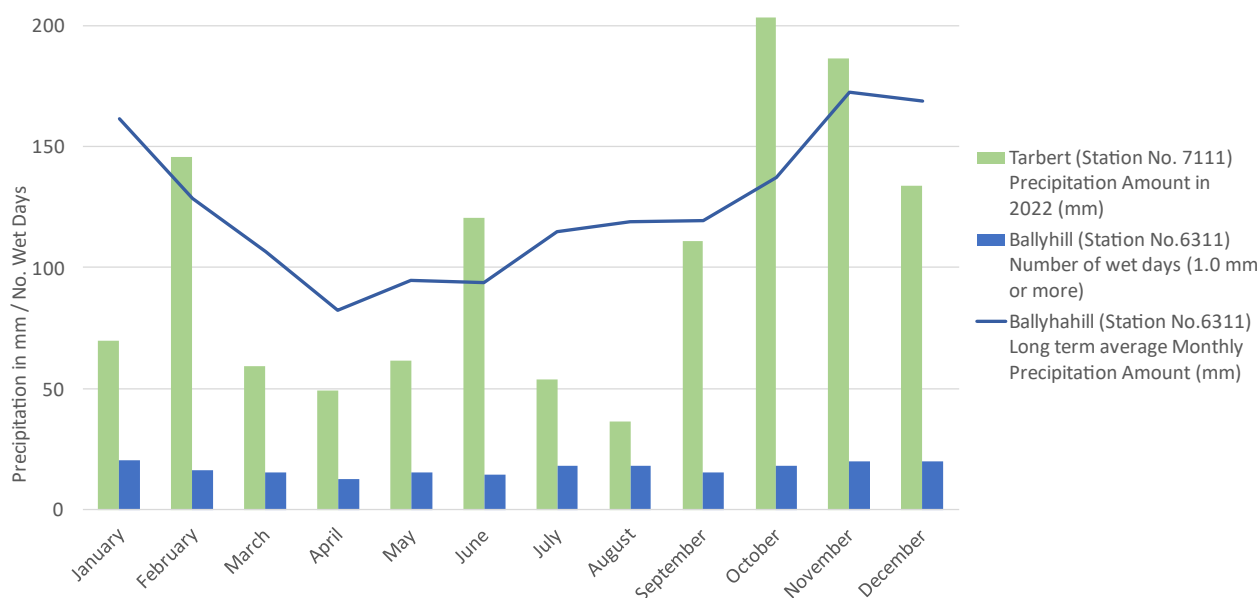


Plate 12.2: Rainfall data for Tarbert area (Source; Met Eireann, 2023)

12.4.2 Hydrology

The description of the baseline condition of the surface water environment and the identification of hydrological receptors with the potential to be impacted by the Proposed Development, focuses on the following constraint types:

- Surface waterbodies, and associated water quality and hydromorphology.
- WFD river sub basins.
- Surface water abstraction/ monitoring/ discharge points.
- Designated sites with surface water dependent habitats or species.
- Surface water flood risk areas.

12.4.2.1 Surface waterbodies

The Site is surrounded by the Lower Shannon Estuary WFD transitional water body (IE_SH_060_0300). A lagoon, located along the southern boundary of the Tarbert HFO Power Station site, separates Tarbert Island from the mainland.

The nearest EPA mapped river waterbody is at 1.7km to the south of the Site and is named Tarbert_010. This waterbody consists of a series of drainage ditches or streams which collate west of Tarbert village in a water source referred to as Doonard Lower, before discharging into the Shannon Estuary at Tarbert. According to the EPA Catchments Map Viewer, the hydromorphological condition (and heavily modified status) of this river waterbody is unknown.

The next nearest EPA mapped river waterbody is Farranmiller_010 located at 1.8km to the south of the Site. According to the EPA Catchments Map Viewer, the hydromorphological condition (and heavily modified status) of this river waterbody is unknown.

There is a small unnamed lake located approximately 200m to the south-east of the Site and is not classified by the EPA as a WFD lake body.

Surface water features within the study area are shown in EIAR Volume III, Figure 12.1. The following table summarises the WFD status of each of the identified surface waterbodies.

Table 12.4: WFD surface waterbodies

WFD Waterbody	Waterbody name	WFD ID	WFD STATUS (2016-2021)	WFD AT RISK STATUS (3RD CYCLE) ²
Tarbert_010	Doonard Lower associated tributaries	IE_SH_24T010100	Moderate	At risk
Farranmiller_010	Farranmiller Streams	IE_SH_24F320750	Good	Review
Lower Shannon Estuary	Shannon Estuary	IE_SH_060_0300	Good	Not at risk

Source: EPA, 2023

² For waterbodies that are 'At Risk' of not meeting their WFD objectives, a significant pressure will have been identified. For waterbodies that are categorised as 'Review', additional information is needed to determine their status before resources and more targeted measures are initiated or the measures have been undertaken, e.g. a wastewater treatment plant upgrade, but the outcome hasn't yet been measured/monitored. For waterbodies that are 'Not at Risk' and therefore are meeting their WFD objectives (EPA, 2023).

12.4.2.2 Surface water quality

According to EPA Catchments, there is one (No. 1) river monitoring station located on the Tarbert_010 river waterbody, at which latest river Q values have been assigned. The Q values refer to a biological rating system for freshwaters where the presence and quantity of specific organisms, primarily invertebrates, are surveyed and the overall health of the watercourse rated. The following table summarises this data.

Table 12.5: EPA latest river Q values

WFD Waterbody	Waterbody name	WFD ID	Latest river Q value (status)	Year
Tarbert_010	Doonard Lower associated tributaries	IE_SH_24T010100	3-4 (Moderate)	2020

Source: EPA, 2023

12.4.2.3 WFD river basins

The WFD was transposed into Irish Legislation by the European Communities (Water Policy) Regulations 2003, (S.I. No. 722 of 2003) on 22nd December 2003. This legislation established the River Basin Districts (RBDs) and provides support for the protection of the status of all waters. River sub basins are a management and reporting unit for the WFD. The Site falls within the Shannon Estuary South catchment 24, WFD Sub catchment ASTEE_WEST_SC_010 and River Sub Basin Ralappane_010.

12.4.2.3.1 Surface water flows

According to EPA Catchments, there is an available river flow estimate generated by the EPA's Hydrotool³ for the Tarbert_010 river waterbody, at approximately 1.8km to the south of the Proposed Development. The following table summarises this data.

Table 12.6: EPA Hydrotool river flow estimates

WFD Waterbody	River Segment ID	Naturalised Flow Estimates (m ³ /s)		
		Q10	Q50	Q95
Tarbert_010	24_1610	0.376	0.107	0.024

Source: EPA, 2023

12.4.2.4 Surface water abstraction/ monitoring/ discharge points

The Tarbert and Farranmiller surface waterbodies are not designated as drinking water rivers and therefore there are no known surface water abstraction locations within the area.

There is an EPA surface water monitoring point located on the Shannon Estuary at 1km to the east of the Site, Tarbert station number 24060 (see EIAR Volume III Figure 12.1). This station records water level only and is currently inactive (EPA Hydronet, 2023). Consistent and long-term level and flow

³ The EPA's Hydrotool is a dataset of naturalised river flow duration percentiles for Irish rivers that will enable assessment of quantitative impacts relating to hydrological alterations. The flow estimates represent flows that could be expected in rivers under naturalised conditions and do not take account of artificial influences of any kind such as water supply abstractions or wastewater discharges.

gauging is important for many purposes including water quality, WFD and flood risk purposes, therefore all hydrometric stations with an 'operational' status would be identified as a constraint/ receptor, with the potential to be impacted by the Proposed Development.

There are no Section 4 (of the Local Government (Water Pollution) Act 1977, as amended) discharges recorded onsite, based on EPA Maps online map viewer [accessed October 2023]. The nearest Section 4 Discharge is located at 2.8km across the estuary to the north at Killimer Dock Local Authority (LA) Reference No WP085.

The existing Tarbert HFO Power Station has a cooling water intake from the Shannon Estuary on the east of Tarbert Island which discharges via the lagoon. There are two foul treatment units onsite to treat sewage before discharge to the Shannon Estuary. Process wastewater from the existing water treatment plant is neutralised prior to discharge. There are also four other process emission points licenced to discharge from the site e.g., from the main engine building, blow down tanks and a chemical bund. Surface water/ rainfall run-off from potential oil contaminated areas of the site drain through oil interceptors. Under Schedule 2 of the EPA Industrial Emissions (IE) Licence P0607-02 - there are ten (no. 10) permitted emission points, across the Site, to the Shannon Estuary.

12.4.2.5 Designated sites with surface water dependent habitats or species

The Site is surrounded by the Lower River Shannon Special Area of Conservation (SAC) (site code 002165) and the River Shannon and River Fergus Estuaries Specially Protected Area (SPA) (site code 004077) (see EIAR Volume III Figure 12.1). The SAC includes numerous Annex I protected habitats and species, including surface water dependent ecosystems (SWDE) such as intertidal flats and supports a diverse macro-invertebrate community (refer to EIAR Volume I Chapter 9: Biodiversity for more information). The SPA is designated for wintering birds, and therefore the qualifying interests are not considered relevant to this study and the SPA site has been scoped out of this assessment.

The Site is directly adjacent to the Tarbert Bay proposed Natural Heritage Area (pNHA). Tarbert Bay consists of a sandy intertidal bay fringed by saline vegetation, and deciduous woodland. It is also designated for habitats suitable for wintering birds. This area is considered likely to be a SWDE and has been included in this assessment.

12.4.2.6 Flood Risk Assessment (FRA)

A site-specific FRA has been prepared for the Site, refer to EIAR Volume II Appendix 12A. A brief summary of the baseline flood risk assessment from the site-specific FRA is provided in this section.

The site-specific FRA for the Site was undertaken in accordance with the requirements of "*The Planning System and Flood Risk Management – Guidelines for Planning Authorities*" (DHLGH, 2009) to demonstrate that the Proposed Development will:

- Not increase flood risk elsewhere and, if practical, will reduce overall flood risk.
- Include measures to minimise flood risk to people, property, the economy, and the environment as far as reasonably possible.

- Include measures to ensure that residual risks to the area and / or development can be managed to an acceptable level.

The 'Stage 1 – Flood Risk Identification' determined negligible risk of flooding to the Proposed Development from fluvial and groundwater sources. The Stage 1 exercise shows that the Proposed Development is in Flood Zone A and at risk of coastal/tidal flooding. The Proposed Development could also be at risk of pluvial flooding.

The 'Stage 1' assessment identified the potential flow flood mechanisms associated with coastal and pluvial events could impact the Proposed Development, which were further assessed in the 'Stage 2 Initial Flood Risk Assessment'.

Further analysis was carried out as part of the Stage 2 Assessment. The CFRAM maps indicate that the Proposed Development is in Flood Zone A for the present day and therefore the risk of coastal flooding has a high probability (OPW, 2023). The CFRAM Climate Change future scenarios extents predict the Proposed Development and surrounding areas to be significantly flooded. Based on the CFRAM flood depth mapping, it is expected that the Proposed Development will flood to a depth of 0.25m to 0.5 m during a 0.5% AEP event. The study estimates that the Proposed Development and surrounding area will be inundated during peak tide levels for all Climate Change future scenarios indicating the risk of flooding is very high. The risk of pluvial flooding to the Site is unknown but will be mitigated by the comprehensive and detailed design of the surface water system.

12.4.2.7 Existing drainage, discharges, and monitoring

The existing drainage / storm water system onsite collects all water from impervious surfaces and pipes it to an underground drainage system. Surface water/ storm water is discharged to the Shannon Estuary via ten (No. 10) permitted emission points and operated under IE Licence P0607-02. All runoff with the potential to become contaminated passes through oil interceptors to retain any hydrocarbons present. The surface water/ storm water emissions points are monitored on a quarterly basis, in accordance with IE Licence P0607-02. There was one breach of surface water trigger level in 2022 of Total petroleum hydrocarbon (TPH) this was investigated, and corrective/ preventative actions were undertaken.

There are several wastewater processors on Site. Boiler "blow down" water and drainage from the engine room is discharged through three outflows via oil interceptors, the water quality from these outflows are tested quarterly. Process water from the demineralisation plant is neutralised before being discharged to the Shannon Estuary, continuous monitoring of pH and flow is undertaken at these emission points alongside quarterly testing. Two foul sewage treatment units treat water on site before discharging to the Shannon Estuary, the effluent from these is monitored quarterly. The final line of wastewater is condenser cooling water this is discharged into the lagoon, the temperature of the incoming and discharged cooling water is measured continuously.

12.4.3 Hydrogeology

The description of the baseline condition of the groundwater environment and identification of hydrogeological receptors with the potential to be impacted by the Proposed Development, focuses on the following constraint types:

- Aquifers, and associated water quality, levels, and flows.
- WFD groundwater bodies.
- Groundwater abstraction/ monitoring points/ discharges.
- Karst landforms and traced underground connections.
- Groundwater dependent terrestrial ecosystems (GWDTEs).
- Areas of groundwater flood risk.

12.4.3.1 Aquifers and groundwater conditions

The baseline superficial deposits and bedrock geology are detailed in EIAR Volume I Chapter 13 Soils and Geology. A summary of the mapped geology, aquifer classifications, groundwater vulnerability and subsoil permeability beneath the Site is provided (GSI, 2023) (refer to EIAR Volume III Figure 12.2 and Figure 12.3):

- The Site is underlain by superficial deposits mapped as industrial Made Ground ⁴. These deposits are not mapped as being an aquifer but are considered likely to act as a pathway to the underlying bedrock aquifer.
- The Site is underlain by bedrock mapped as the Shannon Formation. This consists of a sequence of Namurian mudstone, siltstone, and sandstone. This formation is mapped as being a locally important aquifer, bedrock which is moderately productive only in local zones (LI).
- The mainland immediately to the south of Tarbert Island is mapped as being underlain by till derived from the Namurian sandstones and shales beneath and outcropping bedrock.
- The subsoil permeability on the Site is mapped to be low.
- The groundwater vulnerability onsite is mapped as being Moderate.
- Well yields in the Tarbert area are generally classified as Poor to Moderate (<100m³/d) by GSI ⁵, but with one 'Good' well yield recorded at the former Tarbert Creamery site.

⁴ Made ground: artificial deposits, such as embankments and spoil heaps, on the natural ground surface (<https://www.bgs.ac.uk/datasets/bgs-geology/bgs-geology-themes/>).

⁵ GSI well yields are classified as Excellent = >400m³/ day, Good = 100-400m³/day, Moderate = 40-100m³/day and Poor = <40m³/day ([GSI Groundwater Well and Spring Data - Datasets - data.gov.ie](https://data.gov.ie/datasets/gsi-groundwater-well-and-spring-data))

There have been many historic ground investigations (GI) undertaken on the main Site. A summary of the information from the most recent investigations is provided:

- In 2008 – 2009, URS (now AECOM) undertook a detailed GI of the Tarbert Site, which included eight soil bores and two trial pits, but no deep boreholes (>10m below ground level (bGL)). This included some continuing groundwater monitoring of both new and old monitoring wells (URS, 2009).
- The depth to bedrock was found to vary significantly on the island, with rock encountered at depths of approximately 1m bGL in the centre of the island but up to 9.3m bGL on the estuary shore. The superficial deposits were generally found to consist of a gravel fill material, underlain by clay.
- Numerous bedrock outcrops were observed on the shoreline to the north-west of the Site; however, the island has been built up above the tide line with coarse stone fill material to currents levels.
- In 2022, AECOM undertook a targeted GI following the loss to ground of HFO due to pipe clamp failure on the northern side of the Site. Groundwater samples were taken from five monitoring boreholes onsite (BH306, BH309A, BH319, BH09 and BH12). Shallow groundwater was recorded within the superficial deposits. Only BH319 is located within the Proposed Development site. Table 12.7 below summarises the monitoring boreholes across the existing SSE Tarbert site.
- The report shows a contour plot of shallow groundwater levels between 1 and 3mAOD (AECOM, 2022). Based on the ground elevations across much of Tarbert Island of 3 to 5mAOD, this suggests that groundwater is at approximately 2m bGL.
- The shallow soils encountered onsite were found to have a permeability ranging from 1.79×10^{-5} to 3.7×10^{-5} m/s (AECOM, 2022). The bedrock beneath the mainland tank farm was found to have a lower permeability for 5.5×10^{-7} m/s (AECOM, 2022).
- Monitoring undertaken found that shallower groundwater in the superficial deposits was brackish, indicating that the groundwater quality and levels are tidally influenced. Groundwater in the superficial deposits on the island was inferred to flow in a divergent pattern locally towards the estuary and lagoon, and on the mainland to flow northward and eastward towards the estuary.

- In 2023, AEOM undertook a further GI to obtain recent soil and groundwater quality information with which to validate use of the 2009 soil and groundwater dataset (refer to Appendix 13A, EIAR Volume II). Two monitoring wells (MW401 and MW402) were installed, and groundwater samples collected. Only MW401 is located within the Proposed Development site. Total Petroleum Hydrocarbon (TPH) and heavy metals in groundwater remained below the relevant limits, with the exception of arsenic which was considered to be naturally occurring.

Table 12.7: Summary of monitoring boreholes across SSE Tarbert Site

Borehole name	Phase	Depth	Geological Units	Water strikes during drilling (m bgl)
BH9	LTM	6	Superficial deposits	2.00
BH11	LTM	4.71	Superficial deposits	3.00
BH12	LTM	4.52	Superficial deposits	-
BH26	LTM	-	Superficial deposits	4.30
BH318	LTM	5.70	Superficial deposits	2.50
RC1	LTM	3.40	Superficial deposits	-
BH1	AECOM Additional 2017	3.83	Superficial deposits	-
BH306	AECOM Additional 2017	6.68	Superficial deposits/ bedrock	-
BH319*	AECOM Additional 2017	4.04	Superficial deposits	2.50
BH27	HFO	1.53	Superficial deposits	0.10
BH28	HFO	2.30	Superficial deposits	-
BH29	HFO	3.70	Superficial deposits	1.80
MW401*	AECOM 2023	11.0	Bedrock	2.00
MW402	AECOM 2023	15.0	Bedrock	12.0
-	Unknown			
LTM	Long term Monitoring well			
*	Within proposed development T-4 Site			

12.4.3.2 Groundwater quality

Monitoring is undertaken at seventeen (17 no.) groundwater monitoring wells at the SSE Tarbert Site on a biannual basis, in accordance with IE Licence P607-02. However other groundwater monitoring boreholes have been installed during AECOM's 2008, 2022 and 2023 GIs. Of these locations, only BH319 is located within the Proposed Development.

Monitoring undertaken by SSE in 2022 indicated that there are high concentrations of redox-related parameters, including iron (II) and iron (III), ammonia, nitrite and nitrate, indicate aerobic/oxidizing conditions at most boreholes onsite and sulphur-type odours at some boreholes, particularly close to the reclaimed marshy cooling water lagoon. There is no significant evidence of site-derived pollution by other metals or by organic pollutants at the Site, other than low level hydrocarbons reported in the vicinity of the heavy fuel oil (HFO) pump house. BH319 had elevated ammonia above Drinking Water Standards (DWS) in the September 2022 sample.

More information on the geology and contamination encountered during the historic GI is included in EIAR Volume I Chapter 13 Land and Soils.

12.4.3.3 WFD groundwater bodies

The Site is located within the Ballylongford WFD groundwater body (GWB) (IE_SH_G_030). The most recent WFD status (2016-2021) was reported as 'Good' overall, with 'Good' for both chemical and quantitative categories. In the WFD 3rd Cycle of risk classification, the Ballylongford groundwater body was classified as 'Not at Risk' with respect to meeting 2028 WFD targets (EPA website, 2023). Refer to Appendix 12C WFD Screening Assessment for more detail.

12.4.3.4 Groundwater abstractions/ monitoring points/ discharges

There are no groundwater abstractions onsite. According to the GSI's National Well Database, the nearest mapped groundwater abstractions to the Site are as follows - it is unknown if any of these are active boreholes or are installed in the superficial deposits or bedrock (refer to EIAR Volume III Figure 12.2).

Table 12.8: Summary of groundwater abstractions within 2km

Borehole ID	Owner	Proximity to site	Drilled Date and Depth	Yield (GSI yield class)	Use/ other comments
0813NEW025	Unknown	Approx. 300m	Drilled in 1899 to depth of 12.2m	16.4m ³ /d (Poor)	Agri & domestic use (assumed bedrock well)
0813NEW014	Unknown	Approx. 1.6km	Drilled in 1973 to depth of 2.7m	21.8m ³ /d (Poor)	Agri & domestic use (assumed superficial deposits well)
0813NEW095	Tarbert Creamery	Approx. 1.8km	Drilled in 1899 Depth unknown	216m ³ /d (Good)	Industrial use (assumed bedrock well)

The nearest Source Protection Zone (SPZ) – delineated for the protection of drinking water supplies - is mapped at over 6.5km from the Site.

There is an EPA groundwater monitoring station, Glin (GWIE_SH_G_03036000011), located at approximately 6.1km to the east of the Site (EPA Maps online web viewer, accessed October 2023). This station is not listed on the EPA's Hydronet viewer.

As outlined in EIAR Volume 1, **Chapter 1** (Introduction), the SSE Tarbert Generation Station site operates under an existing IE Licence issued by the EPA (PO607-02). There are no discharges to groundwater permitted on site. The existing IE Licence will be reviewed in consideration of the Proposed Development to determine if a new licence is required or if an amendment will be sufficient.

12.4.3.5 Karst Landforms

There are no karst features mapped within the Site or within 2km of the Site (GSI, 2023).

12.4.3.6 Groundwater Dependent Terrestrial Ecosystems (GWDTE)

The Ballylongford GWB IE_SH_G_030 is classified as a groundwater body important for SAC species and habitats and SPA habitats (EPA Maps online web viewer, accessed October 2023).

The qualifying interests listed for the Lower Shannon Estuary SAC include several habitats which have the potential to be groundwater dependent (Working Group on Groundwater, 2004). These are Atlantic salt meadows [EU Code 1330], Mediterranean salt meadows [1410], Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation [3260], *Molinia* Meadows [6410] and Alluvial forests [91E0] (NPWS, 2013).

The qualifying interests listed for the River Shannon and River Fergus Estuaries SPA do not include groundwater dependent habitats; and therefore, the SPA site is not considered to be a GWDTE and has been scoped out of this assessment.

The Site is directly adjacent to the Tarbert Bay proposed Natural Heritage Area (pNHA). The site consists of a sandy intertidal bay fringed by saline vegetation, and deciduous woodland, it is also designated for habitats suitable for wintering birds. This area is considered likely to be a GWDTE and has been included in this assessment.

12.4.3.7 Groundwater flood risk

According to the GSI's Groundwater Flooding Data Viewer, there are no areas of historic groundwater flooding within the study area. In addition, the soil permeability is low, therefore the Site is deemed to be at low risk.

12.4.4 Summary of Baseline Conditions

Table 12.7 provides a summary of the baseline conditions of the water environment and the sensitivity of each surface water and groundwater receptor identified.

Table 12.9: Summary of water environment receptors and baseline condition

Attribute type	Attribute name	Location	Baseline condition	Data source	Attribute importance/ sensitivity
Surface water/ hydrology					
Transitional water bodies (and quality)	Lower Shannon Estuary (IE_SH_060_0300)	Surrounding the Site to the north, west, east and south-east	Classified as unpolluted, with Good WFD status and Not at Risk (2021, most recent) Designated as SAC (of EU and international importance)	EPA Maps Viewer [Accessed October 2023]	Extremely high
Surface watercourses (and quality)	Tarbert River IE_SH_24T0100	Within 1.7km to south of Site	Classified as Moderate WFD status and Not at Risk (2021, most recent) Hydromorphology status listed as unknown	EPA Maps Viewer [Accessed October 2023]	High
	Farranmiller_010 IE_SH_24F320750	Approximately 1.7km to south of Site	Classified as Good WFD status and Review (2021, most recent) Hydromorphology status listed as unknown	EPA Maps Viewer [Accessed October 2023]	High
SWDEs/ Designated sites	Lower River Shannon SAC	Surrounding the Site to the north, west, east and south-east	Designated (or proposed) status Contains wetland habitats as a qualifying interest and in a favourable conservation condition	NPWS Map Viewer [Accessed October 2023]	Extremely high
	Tarbert Bay pNHA	Within approximately 150m to the south of the Site			Very high
Flood Risk	Proposed Development Site classified as a Highly Vulnerable	Within Site boundary	The Proposed Development is situated in Flood Zone A of coastal flooding. No	FRA Appendix 12A	-

Attribute type	Attribute name	Location	Baseline condition	Data source	Attribute importance/ sensitivity
	Development due to use for essential infrastructure		past flood events are recorded on the Site according to the online OPW flood mapping tool. The FRA has demonstrated that, owing to the existing character of the frontage, the flood extent for with and without climate change, is expected to inundate large areas of the Site including those proposed for development.		
Groundwater/ hydrogeology					
Superficial deposits	Industrial Made Ground	Within site boundary	Not designated as an aquifer by the GSI, considered likely to act as pathway to bedrock aquifer	GSI Map Viewer [Accessed October 2023]	Low (Likely direct hydrogeological connection between Site and nearby protected sites)
	Till derived from Namurian sandstones and shales	Surrounding area	Not designated as an aquifer by the GSI, considered likely to act as pathway to bedrock aquifer	GSI Map Viewer [Accessed October 2023]	Low (Likely direct hydrogeological connection between site and nearby protected sites)
	Alluvium	Surrounding area	Not designated as an aquifer by the GSI, considered likely to act as pathway to bedrock aquifer	GSI Map Viewer [Accessed October 2023]	Low (Likely direct hydrogeological connection between

Attribute type	Attribute name	Location	Baseline condition	Data source	Attribute importance/ sensitivity
					site and nearby protected sites)
Bedrock	Shannon Group, undifferentiated	Underlying Site and surrounding area	Locally important aquifer (LI)	GSI Map Viewer [Accessed October 2023]	Medium (Likely direct hydrogeological connection between site and nearby protected sites)
Groundwater abstractions/ supplies	Groundwater abstraction wells	Nearest at approx. 300 m from Site	Historical boreholes with reported Poor and Good well yields and used for agriculture and domestic/ industrial purposes	GSI Map Viewer [Accessed October 2023]	Low
WFD groundwater bodies (GWBs)	Ballylongford GWB	Underlying site and surrounding area	Good WFD status and Not at Risk of not achieving good status	GSI Map Viewer [Accessed October 2023]	Extremely high
GWDTEs	Lower Shannon Estuary SAC	Surrounding site	Designated status of EU and international importance Contains wetland habitats as a qualifying interest and in a favourable conservation condition	NPWS Map Viewer [Accessed October 2023]	Extremely high
	Proposed NHA Tarbert Bay	Adjacent to the south of the Site	Proposed designated site of national importance. Likely to contain wetland habitats	NPWS Map Viewer [Accessed October 2023]	Very high

12.5 Potential Impacts

Several activities during construction, operation, and decommissioning phases are likely to generate impacts, which have the potential to cause significant effects to the water environment, if unmitigated. The impacts and effects (both beneficial and adverse) are outlined in the following sections. It should be noted that the proposed activities have been assessed following consideration of the embedded mitigation measures (see Section 12.6.1).

12.5.1 Construction Phase

The main potential impacts associated with construction of the Proposed Development include:

- Pollution of water bodies by uncontrolled site runoff.
- Accidental pollution of water bodies by spillages.
- Accidental pollution of water bodies by mobilisation of existing contaminants.
- Changes to WFD status of waterbodies.
- Changes to groundwater levels, flows and contributions to GWDTEs by dewatering.
- Changes to flood risk by uncontrolled site runoff or by construction within areas at risk of flooding.

Pollution of water bodies by uncontrolled site runoff

Vegetation removal, site stripping, stockpiling, vehicle movements and bulk earthworks as part of the construction would leave topsoil and superficial deposits exposed to erosion by wind or rain. This could potentially lead to the accidental pollution of water bodies by uncontrolled site runoff and by increases in sediment loading leaving the Site and entering nearby water bodies, in this case, the adjacent Lower Shannon Estuary SAC. The impact of a high sediment load entering the SAC could impact on both water quality and the habitat (see EIAR Volume I Chapter 9: Biodiversity). The Tarbert and Farranmiller river waterbodies are at approximately 1.9km from the Site and are considered unlikely to be at risk of this potential impact. The shallow nature of groundwater and presence of outcropping bedrock suggests that there is a hydraulic connection between surface water and groundwater in this setting. This connection means that any potential for direct adverse impacts on surface water quality are also valid for groundwater quality in the bedrock aquifer and the Ballylongford WFD GWB.

Considering the CEMP, runoff containing large amounts of suspended solids leaving the construction areas and entering the estuary is considered unlikely to occur. The importance of the Lower River Shannon SAC and the Ballylongford WFD GWB is considered to be extremely high, and of the bedrock aquifer to be medium; the impact magnitude is considered to be negligible; which combined would result in an **imperceptible** effect on these receptors.

Accidental pollution of water bodies by spillages

Any construction activities carried out close to surface waters involve a risk of pollution due to accidental spillage and leaks. While liquids such as oils, lubricants, paints, bituminous coatings, preservatives and weed killers present the greatest risk, fuel spillages from machinery operating close to watercourses also present a risk. The refuelling of general construction plant also poses a significant risk of pollution, depending on how and where it is carried out. In addition, lime and concrete (specifically, the cement component) is highly alkaline, and any spillage could affect the pH of the receiving waterbody.

Accidental spillages may potentially result in a direct or indirect impact to surface water should contaminants enter surface waters directly, in this case, the adjacent Lower Shannon Estuary SAC. This potential for direct adverse impacts on surface water quality is also valid for groundwater quality in the bedrock aquifer and the Ballylongford WFD GWB.

Considering the CEMP, accidental spillages and leaks are considered unlikely to occur and should they occur are likely to be temporary. The importance of the Lower River Shannon SAC and the Ballylongford WFD GWB is considered to be extremely high, and of the bedrock aquifer to be medium; the impact magnitude is considered to be negligible; which combined would result in an **imperceptible** effect on these receptors.

Accidental pollution of water bodies by mobilisation of existing contaminants

Vegetation removal, site stripping, stockpiling, vehicle movements and bulk earthworks as part of the construction would leave topsoil and superficial deposits, and any existing contamination, exposed to erosion by wind or rain. Mobilisation of existing contamination could then either move downwards with rainfall providing a driving head into the underlying superficial deposits and/ or bedrock aquifer, or to move laterally towards and into surface waterbodies, in this case, the adjacent Lower Shannon Estuary SAC. More information on the existing groundwater contamination encountered during the GI is included in EIAR Volume I Chapter 13 Land and Soils.

Considering the CEMP, accidental pollution by mobilisation of existing contaminants is considered unlikely to occur and should they occur are likely to be temporary. The impact magnitude is considered to be negligible, which combined would result in an **imperceptible** effect on the Lower River Shannon SAC, the Ballylongford WFD GWB and bedrock aquifer receptors.

Changes to WFD status of waterbodies

The potential impacts on the WFD status of the adjacent Lower Shannon Estuary transitional waterbody, and underlying Ballylongford WFD GWB were assessed in EIAR Volume II, Appendix 12C: WFD Screening Assessment.

Considering the CEMP, the WFD Screening Assessment concluded that the Proposed Development is not going to:

- Cause a deterioration in the status of all surface and groundwater bodies assessed.
- Jeopardise the objectives to achieve 'Good' surface water/groundwater status.
- Jeopardise the attainment of 'Good' surface water/groundwater chemical status.

- Jeopardise the attainment of 'Good' surface water/groundwater quantity status.
- Permanently exclude or compromise the achievement of the objectives of the WFD in other waterbodies within the same river basin district.

Changes to groundwater levels, flows and contributions to GWDTEs by dewatering

The potential impacts on groundwater level, flow and availability during construction are likely to arise from potential dewatering activities required to facilitate excavations for the underground electrical connections, drainage infrastructure, as well as any foundations required for the development. The depths of the proposed excavations are 2-3m bGL. Shallow groundwater is present in the superficial deposits between 1 and 3m bGL such that the water table is likely to be intercepted during excavation works.

Temporary dewatering or altered drainage regimes may divert water away from GWDTEs, such as the SAC, or create flow barriers, leading to groundwater level and flow alteration. The magnitude of any temporary dewatering will depend on the depth of excavation; however, impacts associated with temporary dewatering or altered drainage regimes are likely to be localised to Tarbert Island. The impact magnitude is considered to be negligible, which combined would result in an **imperceptible** effect on the Lower River Shannon SAC, the Ballylongford WFD GWB and bedrock aquifer receptors.

Changes to flood risk

Vegetation removal, site stripping, stockpiling, vehicle movements and bulk earthworks as part of the construction could leave topsoil and superficial deposits exposed to erosion by wind or rain. This could potentially lead to an increase in site-runoff leaving Site during construction and to an increase in flood risk from pluvial sources. Considering the CEMP, uncontrolled site-runoff leading to an increased flood risk from pluvial sources is considered unlikely to occur, and should it occur would be temporary. The impact magnitude is considered to be negligible, which combined would result in an **imperceptible** effect on the Lower River Shannon SAC, the Ballylongford WFD GWB and bedrock aquifer receptors.

The CFRAM maps indicate that the Proposed Development is located in a Flood Zone A for the present day and therefore the risk of coastal flooding has a high probability. The CFRAM maps for Climate Change future scenarios predict that the Proposed Development and surrounding area to be significantly flooded. A flood defence scheme ('Proposed Flood Defence Scheme') was prepared for a previously submitted planning application for power generation on the southwest of the SSE Tarbert site. In 2022, AECOM carried out a review of the Proposed Flood Defence Scheme which concluded that the type and extent of flood defences proposed are considered suitable for the Proposed Development, with the addition of a revised flood defence wall. Refer to EIAR Volume II, Appendix 12A FRA for more detail.

The comprehensive and detailed design of the surface water system, ground levels, finished slab levels, and Sustainable Drainage Systems (SuDs) measures will mitigate pluvial flood risk to the Proposed Development and ensure that the Proposed Development does not increase the pluvial flood risk to neighbouring properties. Refer to EIAR Volume II, Appendix 12B Surface Water Drainage Strategy for

more detail. The impact magnitude is considered to be negligible, which combined would result in an **imperceptible** on the identified flood risk receptors i.e., neighbouring properties.

Table 12.10: Potential Construction Impacts and Effects (where impact pathways exist)

Potential impact	Impact pathway	Magnitude of impact with embedded mitigation (Section 12.6.1)	Identified receptor (and sensitivity/importance)	Effect significance with embedded mitigation (Section 12.6.1)
Pollution of water bodies by uncontrolled site runoff	Potential direct linkage as surface runoff	Negligible (and temporary)	Lower River Shannon SAC (extremely high)	Imperceptible
	Potential indirect linkage as recharge via overlying superficial deposits		Bedrock aquifer (medium)	
	Potential indirect linkage as recharge via overlying superficial deposits		Ballylongford WFD GWB (extremely high)	
Accidental pollution of water bodies by spillages	Potential direct linkage as surface runoff	Negligible (and temporary)	Lower River Shannon SAC (extremely high)	Imperceptible
	Potential indirect linkage as recharge via overlying superficial deposits		Bedrock aquifer (medium)	
	Potential indirect linkage as recharge via overlying superficial deposits		Ballylongford WFD GWB (extremely high)	
Accidental pollution of water bodies by mobilisation of existing contaminants	Potential direct linkage as surface runoff	Negligible (and temporary)	Lower River Shannon SAC (extremely high)	Imperceptible
	Potential indirect linkage as recharge via overlying superficial deposits		Bedrock aquifer (medium)	
	Potential indirect linkage as recharge via overlying superficial deposits		Ballylongford WFD GWB (extremely high)	
Changes to groundwater levels, flows and contributions to GWDTEs by dewatering	Potential indirect linkage via superficial deposits	Negligible (and temporary)	Lower River Shannon SAC (extremely high)	Imperceptible
	Potential indirect linkage via superficial deposits or direct if excavations extend into bedrock		Bedrock aquifer (medium)	

Potential impact	Impact pathway	Magnitude of impact with embedded mitigation (Section 12.6.1)	Identified receptor (and sensitivity/importance)	Effect significance with embedded mitigation (Section 12.6.1)
	Potential indirect linkage via superficial deposits or direct if excavations extend into bedrock	Negligible (temporary, very localised impact and unlikely to change WFD status)	Ballylongford WFD GWB (extremely high)	
Changes to flood risk	Potential direct linkage as surface runoff	Negligible (and temporary)	Proposed Development	Imperceptible

12.5.2 Operational Phase

The main potential impacts associated with operation of the Proposed Development include:

- Pollution of waterbodies by surface water (rainwater) and process water discharges.
- Accidental pollution of water bodies by spillages.
- Changes to WFD status of waterbodies.
- Changes to groundwater levels, flows and contributions to GWDTEs by underground structures.
- Changes to flood risk.

Pollution of waterbodies by surface water and process water discharges

During the operational phase, the placement of increased impervious surfaces at the Site could lead to an increase in the volume and rate of surface water runoff from the Site and to a pollution risk to the receiving waterbody, the Shannon Estuary. A Surface Water Drainage Strategy Report has been prepared and outlines the proposed point of discharge, attenuation (filter drains and geo-cellular storage), Sustainable Urban Drainage Systems (SuDS), oil separators and maintenance plan for the management of surface water (rainwater) at the Proposed Development. The drainage system for the Proposed Development will be an extension of the existing drainage infrastructure, which will tie-in at sampling point SE3/ outfall 8 and 9, located immediately south of the northern tip of the Site. There are ten (no. 10) existing emission points from the SSE Tarbert HFO Power Station site to the Shannon Estuary, to facilitate the discharge of boiler blowdown, boiler house drainage units, drainage from engine rooms, neutralised water treatment effluent, condenser cooling water and cooling water screen wash water, and each with emission limit values (ELVs) assigned (EPA, 2004). The proposed surface water discharges/ emissions will be regulated by a new IE Licence or by amendment of the existing IE Licence P0607-02, following a review. Refer to EIAR Volume II, Appendix 12A Flood Risk Assessment, and Appendix 12B Surface Water Drainage Strategy Report.

During the operational phase, the generation of process wastewater could lead to an increase in the overall discharge from the Site and to a pollution risk to the receiving waterbody, the Shannon Estuary. The process wastewater from the production of demineralised water will contain the naturally occurring minerals removed from the mains water. Wastewater will be treated to adjust the pH to neutral range before discharge to the surface water drainage system, and ultimately to sampling point SE3/ outfall 8 and 9. This discharge will be regulated by a new IE Licence or by amendment of the existing IE Licence P0607-02, following a review. The process wastewater generated by the fuel polishing system and wastewater generated from blade washing will be stored in a tank onsite. The waste from the tank will periodically be disposed offsite by road tanker in compliance with the Waste Management Act 1996 (as amended), and associated regulations for disposal. Refer to EIAR Volume I Chapter 16 (Material Assets) and Chapter 18 (Waste Management).

During the operational phase, the foul water generated by the Proposed Development will enter the foul water treatment network proposed on the SSE Tarbert site and will be piped to the new sewage treatment plant, located to the north-west of the proposed demineralisation water tanks. This treatment plant will comprise of a septic tank and trickle filter and will discharge to existing outfall 8 and 9/ SE3. Refer to EIAR Volume III Chapter 5 Figures for more details. The Proposed Development will not lead to an increase in staff and therefore there will be no additional foul water generated and as a result there will be no requirement for increased foul water management at the Site. Therefore, no impact is anticipated as result of this activity on the identified receptors.

Considering the CEMP, pollution of waterbodies by surface water and process water discharges are considered unlikely to occur and should they occur are likely to be temporary. The impact magnitude is considered to be negligible, which combined would result in an **imperceptible** effect on the Lower River Shannon SAC, the Ballylongford WFD GWB and bedrock aquifer receptors.

Accidental pollution of waterbodies by spillages

Any activities carried out close to surface waters involve a risk of pollution because of accidental spillage and leaks. While liquids such as oils, lubricants, paints, bituminous coatings, preservatives and weed killers present the greatest risk, fuel spillages from machinery operating close to waterbodies also present a risk.

Similar to during the construction phase, accidental spillages may potentially result in a direct or indirect impact to surface water should contaminants enter waterbodies directly, in this case, the adjacent Lower Shannon Estuary SAC. This potential for direct adverse impacts on surface water quality is also valid for groundwater quality in the bedrock aquifer and the Ballylongford WFD GWB.

Considering the CEMP, accidental spillages and leaks are considered unlikely to occur and should they occur are likely to be temporary. The impact magnitude is considered to be negligible, which combined would result in an **imperceptible** effect on the Lower River Shannon SAC, the Ballylongford WFD GWB and bedrock aquifer receptors.

Changes to WFD status of waterbodies

The potential impacts on the WFD status of the adjacent Lower Shannon Estuary transitional waterbody, and underlying Ballylongford WFD GWB were assessed in EIAR Volume II, Appendix 12C: WFD Screening Assessment.

Considering the CEMP, the WFD Screening Assessment concluded that the Proposed Development is not going to:

- Cause a deterioration in the status of all surface and groundwater bodies assessed.
- Jeopardise the objectives to achieve 'Good' surface water/groundwater status.
- Jeopardise the attainment of 'Good' surface water/groundwater chemical status.
- Jeopardise the attainment of 'Good' surface water/groundwater quantity status.

- Permanently exclude or compromise the achievement of the objectives of the WFD in other waterbodies within the same river basin district.

Changes to groundwater levels, flows and contributions to GWDTEs

The potential impacts on groundwater level, flow and availability during operation that could arise relate to the presence of underground structures, such as foundations or permanent piling required for the Proposed Development. The depths and nature of the proposed underground structures are unknown. However, shallow groundwater is present in the superficial deposits between 1 and 3m bGL and therefore the water table is likely to be intercepted by underground structures.

Altered groundwater flow regimes in the superficial deposits may divert water away from GWDTEs, such as the SAC, or create flow barriers, leading to groundwater level and flow alteration. The magnitude of any change will depend on the depth and nature of the structures. Impacts associated with altered groundwater flow regimes are likely to be localised to the superficial deposits and to Tarbert Island. The impact magnitude is considered to be negligible, which combined would result in an **imperceptible** effect on the identified receptors.

Changes to flood risk

Drainage networks have the potential to be blocked and lose capacity, which can ultimately lead to surface water flooding.

Considering the CEMP, which includes flood defence infrastructure monitoring and maintenance, surface water flooding is considered unlikely to occur, and should it occur would be temporary. The impact magnitude is considered to be negligible, which combined would result in an **imperceptible** effect on the identified receptors.

Table 12.11: Potential Operation Impacts and Effects (where impact pathways exist)

Potential impact	Impact pathway	Magnitude of impact with embedded mitigation (Section 12.6.1)	Identified receptor (and sensitivity/importance)	Effect significance with embedded mitigation (Section 12.6.1)
Pollution of water bodies by increased runoff/ discharge	Potential direct linkage as surface runoff	Negligible	Lower River Shannon SAC (extremely high)	Imperceptible
Accidental pollution of water bodies by spillages	Potential direct linkage as surface runoff	Negligible	Lower River Shannon SAC (extremely high)	Imperceptible
	Potential indirect linkage as recharge via overlying superficial deposits		Bedrock aquifer (medium)	
	Potential indirect linkage as recharge via overlying superficial deposits	Negligible (very localised impact and unlikely to change WFD status)	Ballylongford WFD GWB (extremely high)	
Changes to groundwater levels, flows and contributions to GWDTEs by underground structures	Potential indirect linkage via superficial deposits	Negligible	Lower River Shannon SAC (extremely high)	Imperceptible
	Potential indirect linkage via superficial deposits or direct if structures extend into bedrock		Bedrock aquifer (medium)	
	Potential indirect linkage via superficial deposits or direct if structures extend into bedrock		Ballylongford WFD GWB (extremely high)	
Changes to flood risk	Potential direct linkage as surface runoff	Negligible	Proposed Development	Imperceptible

12.5.3 Decommissioning Phase

It is expected that decommissioning will take up to one year. Effects arising from the process of decommissioning of the Proposed Development are considered to be of a similar nature and duration to those arising from the construction phase and are therefore have not been considered separately.

12.6 Mitigation Measures

A range of measures that are standard good practice for development of this type, and which are required to comply with environmental protection legislation, will be implemented. These are well-developed and have been successfully implemented on infrastructure projects across the country and there is a high degree of confidence in their success. They can therefore be treated as embedded mitigation and will include the following measures.

12.6.1 Embedded Measures

Construction Environmental Management Plan

A CEMP has been prepared as part of the planning application, refer to EIAR Volume II Appendix 5A. In advance of work starting onsite, the appointed Contractor will update the CEMP, considering any additional requirements of the Design Team or Planning Regulator in agreement with the planning authority.

The CEMP covers all potentially polluting activities and includes a Site Emergency Response Plan (ERP). All personnel working on the Site will be trained in the implementation of the procedures. Refer to EIAR Volume I, Chapter 19: Major Accidents and Disasters for more detail.

Surface Water Management Strategy

A Surface Water Management Strategy has been prepared as part of the planning application, refer to EIAR Volume II Appendix 12B. The strategy outlines the proposed point of discharge, attenuation (filter drains and geo-cellular storage), SuDS, oil separators and maintenance plan for the management of surface water (rainwater) at the Proposed Development. The proposed drainage system will tie-in with existing drainage infrastructure at sampling point SE3/ outfall 8 and 9, located immediately south of the northern tip of the Site, and which allows disposal of surface water to the estuary. The maintenance required for drainage networks will be carried out in accordance with standard guidance and practice, such as the manufacturer's guidance for maximum efficiency of the oil interceptors.

Proposed Flood Defence Scheme

A flood defence scheme ('Proposed Flood Defence Scheme') was prepared for a previously submitted planning application for power generation on the south-west of the SSE Tarbert site. In 2023, AECOM carried out a review of the Proposed Flood Defence Scheme which concluded that a new flood defence design consisting of flood walls and gates positioned closer to the main elements of the proposed OCGT will be more appropriate for the Proposed Development given its position within the Site. Refer to EIAR Volume II, Appendix 12A and 12B for more detail.

12.6.2 Construction Phase Measures

Pollution Prevention Measures

During all phases of the Proposed Development (construction, operation, and decommissioning), pollution prevention measures, general surface water management and good practice will be adopted, as detailed within the CEMP as embedded mitigation. The CEMP will be further refined, and expanded by the Contractor, into a Contractor's CEMP. The mitigation measures will include the following:

- The existing surface water management system, such as drains, outfalls and interceptors / separators, will be inspected and confirmed to be in suitable working order prior to any development associated with the Proposed Development commencing on the Site.
- New drainage installations will be installed in early stages of construction and will be used to treat runoff for silt and hydrocarbons early in the programme. Daily weather forecasting will also be used to inform the works schedule, ensuring excavation works do not coincide with high intensity or extreme rainfall events.
- The proposed surface water management system, including existing and proposed infrastructure, will be inspected, and confirmed to be of sufficient capacity to treat any additional water generated by the Proposed Development, including runoff from dust suppression, prior to discharge.
- Washout from power cleaning of drainage lines, oil interceptors or any other pipework which may contain pollutants will be collected and treated. No contaminated washout will be allowed enter any water body or be discharged to ground.
- There will be regular monitoring and prompt maintenance of the overall surface water management system throughout the construction works for the Proposed Development. This will ensure that the drainage system continues to function as designed.
- There will be no direct discharge to any water body at any time during the demolition, construction, or decommissioning phases. All surface water run-off within the Site will be directed to this drainage system.

Sedimentation of Surface Waters

During the construction phase, the mitigation measures will ensure that no sediment contamination, contaminated run-off or untreated wastewater will enter watercourses on or near the Site. These measures are defined in the CEMP as embedded mitigation. The CEMP will be further refined, and expanded by the Contractor, into a Contractor's CEMP. The mitigation measures will include the following and will be implemented in full:

- Excavations will only remain open for the shortest possible time to reduce groundwater ingress. During site works, sediment mat or silt traps will be placed immediately downstream of any works to reduce silt loss, and these should be inspected and cleaned or replaced regularly.
- Run-off from spoil heaps will be prevented from entering watercourses by diverting it through settlement ponds and removing material off-site as soon as possible to designated storage areas.
- During site works, sediment mats or silt traps will be placed at any drainage crossing points to avoid siltation of channels and, if the need arises, silt fences will be used during the course of works in order to reduce the potential for pollution of watercourses. These will be maintained and cleaned regularly throughout the construction phase.
- Good construction practices will also be used during the construction phase, such as wheel washers and dust suppression on-site roads and at the Site access points.
- Surface water run-off from working areas will not be allowed to discharge directly to Shannon Estuary. To achieve this, the current underground drainage network will be used to collect all run off from impervious surfaces. All design and construction will be carried out in accordance with CIRIA C532 *Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors*.
- Dewatering fluids will be pumped via settlement tanks or collection basins where any solids in the water will settle out.

Fuel and Chemical Handling

During the construction phase, the mitigation measures will prevent spillages to ground and drains of fuels and any subsequent surface water impacts. These measures are defined in the CEMP as embedded mitigation. The CEMP will be further refined, and expanded by the Contractor, into a Contractor's CEMP. The mitigation measures will include the following:

- Designate a bunded storage area at the Contractor's compound(s) away from surface water gullies or drains for oils, solvents and paints used during construction. The fuel storage tanks will be bunded to a volume of 110% of the capacity of the largest tank / container within the bunded area.
- Drainage from the bunded area will be diverted for collection and safe disposal. All containers within the storage area will be clearly labelled so that appropriate remedial action can be taken

in the event of a spillage. When moving drums from the bunded storage area to locations within the Site, a suitably sized spill pallet will be used for containing any spillages during transit.

- Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in designated impermeable refuelling areas isolated from surface water drains. Spill kit facilities will be provided at the fuelling area in order to provide for any accidental releases or spillages in and around the area. Any used spill kit materials will be disposed of via a hazardous waste contractor.
- All equipment and machinery will be checked for leaks and other potential sources of contaminants before arriving on-site and on a daily basis. Any equipment or machinery likely to introduce to contaminants will not be brought on-site or will be removed from the Site immediately if any leak is discovered. Spill kits will be available to machine operators, and they will be trained in their use.
- The storage of hazardous substances will be necessary during construction. Fuel will be stored at least 50m from a water body and refuelling will only take place in designated areas, on hardstanding by appropriately trained personnel.
- Adequate stocks of hydrocarbon absorbent materials (e.g., spill-kits and / or booms) will be held on-site to facilitate response to accidental spills. Spill response materials will also be stored on all construction vehicles.

Control of Concrete and Lime

During the construction phase, the mitigation measures will prevent uncontrolled runoff containing concrete and lime wash-down and any subsequent surface water impacts. These measures are outlined in the CEMP as embedded mitigation. The CEMP will be further refined, and expanded by the Contractor, into a Contractor's CEMP. The mitigation measures will include the following:

- No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the Site within 20m of an existing surface water drainage point. Washouts will only be allowed to take place in designated areas with an impervious surface.
- Concrete will be used to construct the Proposed Development and will therefore be managed to reduce the potential for pollution. The Contractor will manage and mitigate concrete works ensuring that no concrete is laid during wet weather if achievable, so to reduce the risk of concrete being washed off the Site and into the surface water drains or water bodies.

- Concrete mixing will be undertaken in designated impermeable areas, at least 10m away from a water body or surface water drain to reduce the risk of runoff entering a water body, or the sub-surface, or groundwater environment.

Accidental Spillage, Flooding or Other Emergencies

During the construction phase, the mitigation measures will prevent accidental spillage and any subsequent surface water impacts and will describe the actions to be taken in the event of a possible flood event or site emergency, as outlined in the CEMP as embedded mitigation. The CEMP will be further refined, and expanded by the Contractor, into a Contractor's CEMP. The mitigation measures will include the following:

- Leaking or empty oil drums will be removed from Site immediately and disposed of via an appropriately licensed waste disposal contractor.
- Spill kits and oil absorbent material will be carried by mobile plant and located at vulnerable locations (e.g., near oil filled equipment). Booms will be held on-site for works near water body/ drains. Spill kits will contain a breakable tie to show use and indicates whether it needs to be replenished. The Site Manager and Environmental Site Representative (ESR) will be responsible for replenishing spill kits.
- The Site ERP will be updated by the appointed Contractor and included in the CEMP and construction workers trained to respond to spillages.
- A copy of the Site ERP will be kept in the Site Emergency Information File (along with other safety emergency preparedness plans) together with the results of any test of the plan.
- Oil interceptors will be installed for refuelling areas; runoff from washing areas that contains detergents which may prevent oil interceptors from working correctly will be prevented from entering oil separators by providing separate designated areas for washing and refuelling.
- Discharge with oils and chemicals from vehicle washing areas will be considered as trade effluent and therefore will be disposed off-site.
- The installation of protective bunds along all water body boundaries and drains during construction will filter contaminants and prevent adverse runoff.
- Any plant, machinery or vehicles will be regularly inspected and maintained to ensure they are in good working order and clean for use.

- Any Site welfare facilities will be appropriately managed, and all foul waste disposed of by a licenced contractor to a suitably permitted facility.
- During the construction phase, the Contractor will monitor weather forecasts on a monthly, weekly, and daily basis, and plan works accordingly. The Contractor will describe in the Site ERP the actions it will take in the event of a possible flood event. These actions will be hierarchal meaning that as the risk increases the Contractor will implement more stringent protection measures. This is important to ensure all workers, the construction site and third-party land, property and people are adequately protected from flooding during the construction phase.
- Weekly checks will be carried out to ensure surface water drains are not blocked by silt, or other items, and that all storage is located at least 50m from the edge of the SAC. A regular log of inspections will be maintained, and any significant blockage or spill incidents will be recorded for root cause investigation purposes and updating procedures to ensure incidents do not reoccur.
- The coastal flood defences height levels are not to be compromised throughout the construction phase unless formally agreed with the Client and Designer, as this may increase the flood risk and/or risk of bank failure and subsequent flooding.
- Construction material(s), demolition materials and plant/welfare will not to be stored in the flood extents or elevated to minimise the impacts of flooding.
- All temporary works within the flood extents will be designed taking into account a flood impact loading and where possible, the Contractor will choose materials and/or equipment that are flood compatible to minimise the risk if a flood were to occur during any construction works.
- Continuous monitoring of weather conditions and tidal levels including surges will be completed throughout the works period.

Construction Dewatering

Shallow groundwater is present in the superficial deposits at the Proposed Development, such that the water table is likely to be intercepted during excavation works and dewatering activities required to facilitate excavations for the underground electrical connections, drainage infrastructure, as well as any foundations required for the development. The Contractor's CEMP will include a programme of groundwater level and quality monitoring at existing groundwater monitoring boreholes at the SSE Tarbert site and controlled discharge of water abstracted during dewatering. Any discharge of and any

consenting requirements for the discharge of such water, following treatment, will be discussed, and agreed with the EPA prior to the commencement of work.

12.6.3 Operational Phase Measures

Pollution Prevention and Control

During all phases of the Proposed Development (construction, operation, and decommissioning), pollution prevention measures, general surface water management and good practice will be adopted.

The Proposed Development will comply with the Industrial Emissions Directive (IED) ⁶ under a new IE Licence or an amendment to the existing IE Licence P0607-02, following review, which is required for operation. The IE Licence will set out strict conditions on how the Proposed Development must operate so that any impacts of emissions to air, soil, surface and groundwater, and effects on the environment and human health will be minimised and avoided, where possible.

The Site will be operated in line with appropriate standards and the Applicant will implement and maintain an Environment Management System (EMS) which will be certified to International Standards Organisation (ISO) 14001. The EMS will outline requirements and procedures required to ensure that the Proposed Development is operating to appropriate standards.

Hazard Prevention and Emergency Planning

Measures to prevent the risks of fire, flooding, spillages, or other potentially major incidents will be embedded in the design, as outlined in EIAR Volume I, Chapter 19: Major Accidents and Disasters. Measures that will be implemented to prevent potentially major incidents include the following:

- Compliance with all relevant health, safety, and environmental legislation, including COMAH.
- Design, build and operation in accordance with international, national, and established industry codes, standards, and practice.
- A detailed chemical inventory and risk assessments for all materials handled on-site will be produced in accordance with the requirements of the Chemical Agents legislation.
- All fuels and chemicals stored on-site will be subject to the Safety, Health and Welfare at Work (Chemical Agents) Regulations, as amended by *S.I. No. 231/2021* as well as compliance with the requirements of Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).
- Regular maintenance and inspections to reduce the risk of equipment failures which could lead to a loss of containment.
- Bunded or double-skinned storage areas for liquid chemicals.

⁶ Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast)

- Regular maintenance and site housekeeping to reduce the likelihood of leakages and improve leakage detection.
- Spill kits stored on Site.
- The Contractor will develop a Site ERP in accordance with legislative requirements including COMAH and IE Licence, which will include dealing with events such as fires, spillages, flooding etc. Refer to EIAR Volume I, Chapter 19: Major Accidents and Disasters for more detail. Procedures will be in place to clearly outline the responsibilities, actions and communication channels for operational staff and personnel on how to deal with emergencies should they occur. Such measures will be included in the Site operating and management system and regulated by EPA through the IE Licence.

Flood Risk Mitigation

The Proposed Flood Defence Scheme will be implemented to protect the Proposed Development from coastal/ tidal flooding, while the Surface Water Management Strategy will be implemented to mitigate pluvial flood risk to the Proposed Development and ensure that the Proposed Development does not increase the pluvial flood risk to neighbouring properties. Refer to EIAR Volume I, Appendix 12A FRA and 12B Surface Water Drainage Strategy for more detail.

12.6.4 Decommissioning Phase

As outlined in EIAR Volume I Chapter 5 (Description of the Proposed Development), in the event of decommissioning, measures will be undertaken to ensure that there will be no significant, negative environmental effects from the development.

12.7 Residual Impacts

12.7.1 Construction Phase

Considering the implementation of the mitigation measures set out in Section 12.6, the magnitude of construction phase impacts is considered to be negligible, which combined with the importance of the identified water environment receptors would result in an **imperceptible** effect. The residual impact on the water environment is therefore **imperceptible**.

12.7.2 Operational Phase

Considering the implementation of the mitigation measures set out in Section 12.6, the magnitude of construction phase impacts is considered to be negligible, which combined with the importance of the identified water environment receptors would result in an **imperceptible** effect. The residual impact on the water environment is therefore **imperceptible**.

12.7.3 Decommissioning Phase

As outlined in Section 12.5.3, effects arising from the process of decommissioning of the Proposed Development are considered to be of a similar nature and duration to those arising from the construction phase and are therefore have not been considered separately.

12.8 Cumulative Impacts

A search of planning applications within 5km of the Site is presented in Table 4.2 of EIAR Volume I Chapter 4. Should these developments be constructed at the same time as the Proposed Development, there is a potential for cumulative effects associated with accidental spills and leaks and the use of concrete and lime on the water environment.

The construction of the TEG project (Planning application ref. EE08.315838) is currently ongoing at the SSE Tarbert site and is due to be completed and operational by the time the construction works associated with the Proposed Development would be commencing. The TEG site will be utilising different discharge points and operated under a new IE Licence for the TEG installation, IE Licence reference P1201-01 (AECOM, 2023b). The BESS application (Planning ref. 20850) will potentially be developed after the decommissioning of the TEG project. The decommissioning of the TEG project is not expected to require ground intrusions. The construction and development of the BESS project will potentially occur at some point after 2028, after and at which point the construction of the Proposed Development would be complete.

If the EirGrid project (Planning Ref. 19115) were to be constructed concurrently with the construction phase of the Proposed Development, there would be limited potential for cumulative impacts with the Proposed Development on the water environment, due to the distance of 1.65km between the sites, and that both sites would be operated under an IE Licence minimising the potential for significant impacts on the water environment.

The EriGrid project (Planning Ref. 23350) is yet to be determined. This project is within the Site of the Proposed Development, and within the SSE Tarbert site. Therefore, there will be strict environmental management in place to ensure CEMPs are in place and adhered to. It is not known if these projects will occur concurrently or if the underground cabling project by EirGrid would commence and be completed before the construction of the Proposed Development would commence. However, as these projects will be within the same Site there will be CEMPs in place for these works to progress, therefore minimising the potential for significant impacts on the water environment.

As reported in Section 12.7, potential emissions to the water environment associated with the Proposed Development will be mitigated to the extent that the impact will not be significant. It is not unreasonable to assume that the committed developments detailed in Table 4.2, 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. With the proposed control measures implemented at the Proposed Development Site and standard best practice control measures implemented as required on all sites, the **cumulative impact will not be significant**.

12.8.1 Do Nothing Scenario

Should the Proposed Development not be progressed, the baseline condition of the water environment would likely remain much the same and it is unlikely that there would be any significant cumulative impacts on the water environment in the vicinity of the Site as a result of the Proposed Development.

12.9 Summary

During the construction phase, potential impacts include pollution of waterbodies by uncontrolled site runoff, accidental pollution by spillages and mobilisation of existing contaminants, changes to groundwater levels, flows and contributions to GWDTEs by dewatering and changes to flood risk. The significance of effects was assessed following consideration of the embedded mitigation measures – the CEMP, the Surface Water Management Strategy and the Proposed Flood Defence Scheme. The residual impact on the water environment is considered **imperceptible**.

During the operational phase, potential impacts include pollution of waterbodies by surface water, process wastewater and foul water discharges, accidental pollution by spillages, changes to groundwater levels, flows and contributions to GWDTEs by underground structures and changes to flood risk. The significance of effects was assessed following consideration of the embedded mitigation measures. The residual impact on the water environment is considered **imperceptible**.

The potential impacts on the WFD status of the adjacent Lower Shannon Estuary transitional waterbody, and underling Ballylongford WFD GWB were assessed in EIAR Volume II, Appendix 12C: WFD Screening Assessment. Considering the CEMP, the WFD Screening Assessment concluded that the Proposed Development is not going to:

- Cause a deterioration in the status of all surface and groundwater bodies assessed.
- Jeopardise the objectives to achieve 'Good' surface water/groundwater status.
- Jeopardise the attainment of 'Good' surface water/groundwater chemical status.
- Jeopardise the attainment of 'Good' surface water/groundwater quantity status.
- Permanently exclude or compromise the achievement of the objectives of the WFD in other waterbodies within the same river basin district.

It was concluded cumulative effects will be **not significant**.

It is respectfully submitted that the Board is enabled to conclude under this assessment that the Proposed Development will not jeopardise the attainment or maintenance of Good WFD status for surface and groundwater water bodies within the study area and will not cause a deterioration of WFD status for surface and groundwater bodies within the study area.

12.10 References

AECOM (2022). Heavy Fuel Oil Spill Response - Tarbert Generating Station - Soil Sampling. Ref: 60673806_ACM_EN_RP_003 dated 30 June 2022.

AECOM (2023a). T-4 Site Investigation - Tarbert Generating Station, ref: 60707258_ACM_RP_EN_0 dated 01 September 2023, for SSE Generation Ireland Limited.

AECOM (2023b). Technical Amendment Submission, ref: 60697004_ACM_RP_EN_01_Technical Amendment, dated 19 October 2023, for SSE Generation Ireland Limited.

AECOM (2022). 2022 Groundwater Monitoring Report SEE Tarbert Generating Station.

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URS, 2009. Environmental Site Assessment ESB Generating Station, Tarbert, Co. Kerry Ref: 49341640 Final Issue No 4 dated 6 November 2009.

Working Group on Groundwater, 2004. Guidance on the application of groundwater risk assessment sheets SWRA 1-6 and GWDTERA 1-9 to areas designated for the protection of habitats and species – Guidance document no. GW11.

SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 13 Land and Soils

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November 2023

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Table of Contents

13.	Land and Soils	13-1
13.1	Introduction	13-1
13.2	Legislation, Policy and Guidance	13-1
13.3	Methodology	13-2
13.4	Baseline Environment.....	13-5
13.5	Site Investigation	13-10
13.6	Potential Impacts	13-13
13.7	Mitigation Measures	13-17
13.8	Residual Impacts	13-20
13.9	Cumulative Impacts	13-20
13.10	Summary	13-21
13.11	References	13-23

Tables

Table 13.1: Estimation of Importance of Geological Attributes	13-3
Table 13.2: Criteria and Examples for Describing Potential Effects on Land and Soils Environment.....	13-4
Table 13.3: Significance Ratings	13-5
Table 13.4: Significance Criteria for Assessment of Natural Resource Usage	13-5
Table 13.5: Adjacent Land Use	13-6
Table 13.6: Site Operational Timeline	13-8
Table 13.7: Summary of Impacts and Mitigation	13-22

Appendices

(Refer to EIAR Volume II)

Appendix 13A: AECOM Site Investigation and Generic Quantitative Risk Assessment Report
Appendix 13B: AECOM Heavy Fuel Oil Spill Response, Tarbert Generating Station Soil Sampling (2022)
Appendix 13C: ESB Generating Station Tarbert, Environmental Site Assessment, URS 2009

Figures

(Refer to EIAR Volume III)

Figure 13.1: Regional Soils Mapping
Figure 13.2: Regional Bedrock Mapping 1:100,000

13. Land and Soils

13.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) assesses the impacts on the land, soil, and groundwater environments associated with the Proposed Development.

This chapter provides a description of the baseline land, soils, and hydrogeology environments of the Site; and a statement of the likely significant effects associated with both the construction, operation and decommissioning phases of the development. A 'do nothing' scenario has also been considered. Mitigation measures are proposed in the form of avoidance, prevention, reduction, offsetting, and reinstatement or remedial measures and commitments for monitoring are included where appropriate predicted residual effects are described.

The application boundary (redline boundary) for the Proposed Development encloses an area of approximately 15.18 hectares (ha) and encompasses land within the SSE Tarbert site ('SSE Tarbert'), which is an area of 42ha, that is mostly under the management of the Applicant.

Full details on the background and site history are provided in EIAR Volume I Chapter 4 (Existing Site and Conditions), and details of the Proposed Development are provided in Chapter 5 (Description of the Proposed Development) and the Planning Statement submitted with this planning application.

13.2 Legislation, Policy, and Guidance

This chapter has been prepared in accordance with to the following:

- EPA (2022). *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* ('EPA Guidelines').
- IGI (2013). *Guidelines for the preparation of Soils Geology and Hydrogeology Chapters of Environmental Impact Statements*.
- IGI (2002). *Geology in Environmental Impact Statements, A Guide*.
- NRA (2009). *Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*.
- CIRIA (2001). *C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors*.
- CIRIA (2000). *C512 Environmental Handbook for Building and Civil Engineering Projects*.
- Planning and Development Act 2000 (S.I. 30 of 2000), as amended
- Kerry County Council (KCC 2022). Kerry County Development Plan 2022-2028

13.3 Methodology

13.3.1 Study Area

The study area with regard to land and soils encompasses the entire area within the redline boundary of the Site and extending to 2km from the Site boundary. This area is considered appropriate for the consideration of historic and current potentially contaminative land uses and aligns with established industry practice and professional judgment for defining land contamination study areas for the assessment.

13.3.2 Determination of the Baseline Environment

The determination of the Baseline Environment objective was achieved by way of a geological desk study, Site visit and Site Investigation (SI), refer to EIAR Volume II Appendix 13A. The sources of the information are listed:

- Ordnance Survey of Ireland (OSI) maps (www.osi.ie, accessed July 2023).
- Geological Survey of Ireland (GSI) Groundwater and Geotechnical map viewer (www.gsi.ie, accessed July 2023).
- EPA Enviro Maps (<https://gis.epa.ie/EPAMaps/>, accessed July 2023).
- AECOM (2022) “2022 Groundwater Monitoring Report - SSE Tarbert Generating Station” report reference 60673806 60673806_ACM_EN_RP_004 dated 14 April 2023
- AECOM Site Visit – 10 May 2023 by Kevin Forde, Contaminant Hydrogeologist, to assess the available site utility and environmental information and to inform the scope and locations of the subsequent site investigations.
- AECOM Site Investigation – September 2023. This site investigation was within the redline boundary and was intended to supplement earlier site investigation findings within the redline boundary and across the wider SSE Tarbert site (refer to Appendix 13A, EIAR Volume II for more details).

Additional information has been compiled through consultation and feedback from the other technical disciplines within the project / EIAR Team.

13.3.3 Determination of Sensitive Receptors

The sensitivity of the existing environment identifies the ability of the receptor to respond to potential effects. Receptors have been identified during the baseline study as set out in Section 13.3.2 and a qualitative assessment has been used to assign a sensitivity rating from low to extremely high based on the NRA ‘*Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*’¹. Assigning a sensitivity rating (refer to Table 13.1) considers an attribute’s likely adaptability, tolerance, and recoverability, as well as their designation.

¹ NRA (2009). *Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*.

With regards to natural resource use, the materials themselves have been identified as the sensitive receptors. Consuming materials impacts upon their immediate and (in the case of primary materials) long-term availability; this results in the depletion of natural resources and adversely impacts the environment.

Table 13.1: Estimation of Importance of Geological Attributes²

Importance	Criteria	Typical Examples
Very High	Attribute has a high quality or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and / or soft organic soil underlying route is significant on a national or regional scale*.	Soil and Geology: - Geological feature rare on a regional or national scale (Natural Heritage Area, NHA) or of high value on a local scale (County Geological Site). - Large existing quarry or pit. - Proven economically extractable mineral resource.
High	Attribute has a high quality or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and / or soft organic soil underlying route is significant on a local scale*.	Soil and Geology: - Contaminated soil on site with previous heavy industrial usage. - Large recent landfill site for mixed wastes. - Geological feature of high value on a local scale (County Geological Sites). - Well drained and/ or highly fertility soils. - Moderately sized existing quarry or pit. - Marginally economic extractable mineral resource.
Medium	Attribute has a medium quality or value on a local scale. Degree or extent of soil contamination is moderate on a local scale. Volume of peat and / or soft organic soil underlying route is moderate on a local scale*.	Soil and Geology: - Contaminated soil on site with previous light industrial usage. - Small recent landfill site for mixed wastes. - Moderately drained and / or moderate fertility soils. - Small existing quarry or pit. - Sub-economic extractable mineral resource.
Low	Attribute has a low quality or value on a local scale. Degree or extent of soil contamination is minor on a local scale. Volume of peat and / or soft organic soil underlying route is small on a local scale*.	Soil and Geology: - Large historical and / or recent site for construction and demolition wastes. - Small historical and / or recent landfill site for construction and demolition wastes. - Poorly drained and / or low fertility soils. - Uneconomically extractable mineral resource.

* Relative to the total volume of inert soil disposed of and / or recovered

13.3.4 Describing Potential Effects

The methodology used for describing the potential geo-environmental effects considers the 'quality' of the effects (i.e., whether it is adverse or beneficial), the 'probability' of the event occurring and the 'duration' of the effects (i.e., whether it is short or long-term) as per both Section 3.7.3 and Table 3.4 of the EPA Guidelines³.

² Source: NRA (2009). Based on criteria outlined in Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

³ EPA (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.

Specific assessment criteria and typical examples for soil and geology (based on information within the NRA 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes'⁴) are outlined in Table 13.2.

Table 13.2: Criteria and Examples for Describing Potential Effects on Land and Soils Environment⁵

Magnitude of Effect	Criteria for Effects	Typical Examples (Positive and Negative)
Large Adverse	Results in loss of attribute	Soil and Geology: • Loss of high proportion of future quarry or pit reserves. • Irreversible loss of high proportion of local high fertility soils. • Removal of entirety of geological heritage feature. • Requirement to excavate/ remediate entire waste site. • Requirement to excavate and replace high proportion of peat, organic soils and / or soft mineral soils beneath alignment.
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Soil and Geology: • Loss of moderate proportion of future quarry or pit reserves. • Removal of part of geological heritage feature. • Irreversible loss of moderate proportion of local high fertility soils. • Requirement to excavate/ remediate significant proportion of waste site. • Requirement to excavate and replace moderate proportion of peat, organic soils and / or soft mineral soils beneath alignment.
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Soil and Geology: • Loss of small proportion of future quarry or pit reserves. • Removal of small part of geological heritage feature. • Irreversible loss of small proportion of local high fertility soils and / or high proportion of local low fertility soils. • Requirement to excavate / remediate small proportion of waste site. • Requirement to excavate and replace small proportion of peat, organic soils and / or soft mineral soils beneath alignment.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Soil and Geology: • No measurable changes in attributes.
Minor Beneficial	Results in minor improvement of attribute quality	• Minor enhancement of geological heritage feature.
Moderate Beneficial	Results in moderate improvement of attribute quality	• Moderate enhancement of geological heritage feature.
Major Beneficial	Results in major improvement of attribute quality	• Major enhancement of geological heritage feature.

⁴ NRA (2009).

⁵ NRA (2009).

13.3.5 Significance of Effects

A qualitative approach was used to determine the significance of effects as per the EPA Guidelines determination figure (Figure 3.4; page 53⁶). Due account was taken of both the sensitivity of the attributes (refer to Table 13.1) and the description of the potential effect (refer to Table 13.2).

Table 13.3: Significance Ratings⁵

	Magnitude of Effect			
	Negligible	Small	Moderate	Large
Importance of Attribute	Extremely High	Imperceptible	Significant	Profound
	Very High	Imperceptible	Significant / Moderate	Profound / Significant
	High	Imperceptible	Moderate / Slight	Significant / Moderate
	Medium	Imperceptible	Slight	Moderate
	Low	Imperceptible	Imperceptible	Slight

With regard to use of natural resources, the following significance criteria have been used.

Table 13.4: Significance Criteria for Assessment of Natural Resource Usage

Effect	Criteria for Effects of Material Assets Used	Significance
Major	Large decrease material assets availability greater than 5% of current baseline potentially causing significant burden to the national material asset market.	Significant
Moderate	Moderate decrease in material asset availability between 2% and 5% of current baseline potentially causing moderate burden to the national material asset market.	
Minor	Minor decrease in material asset availability between 0.1% and 1.9% of current baseline causing a minor burden to the national material asset market.	Not Significant
Negligible	Negligible decrease in material asset availability less than 0.1% of current baseline causing insignificant burden to the local and regional material asset market.	

13.3.6 Limitations and Assumptions

The description of existing conditions is based on the available desk study, Site visit and Site investigation and information supplied by the design team as outlined in Sections 13.4.1.

13.4 Baseline Environment

13.4.1 Site Description

The Site is at the SSE Tarbert site, in Tarbert, County (Co.) Kerry, Ireland (Irish Grid Reference X; 475237; Y: 5826671) (refer to Section 4.4 in Chapter 4 Existing Site and Conditions, EIAR Volume I for further detail). The entire SSE Tarbert site is located within the administrative area of Kerry County Council (KCC). The Proposed Development Site, which is brownfield land located west of the N67, a National Secondary Road in Tarbert. The Temporary Emergency Generation (TEG) site and a National

⁶ EPA (2022).

Oil Reserves Agency (NORA) tank farm are located to the west and south-west, of the Proposed Development Site boundary (refer to Figures 4.1 to 4.4 in EIAR Volume III).

The Site comprises brownfield land, with the western portion being the former contractors yard and containing two disused galvanised sheds (former Mechanical Workshop and former Riggers' Store), a bunded concrete slab (Chemical Storage Compound) and a large vertical cylindrical tank in the north corner (Boiler Wash Effluent (BWE) tank) and the northern portion containing a variety of structures, including a vertical cylindrical Demineralised Water tank, horizontal, cylindrical, bunded sulphuric acid tank, a caustic soda tank, the site Waste Water treatment system infrastructure (two caustic soda tanks and a disused ammonia tank within the water treatment building), a compressor house, a salt store and the Carpenter's workshop.

The surface of the Site consists of sealed tarmacadam and concrete (approximately 30%, mainly in the northern portion) and unsealed hardcore gravel and grassed areas (approximately 70%, mainly in the western portion).

The majority of the Site is generally flat and lies at an elevation of 3m to 5m above Ordnance Datum (AOD).

The area available for the Proposed Development (the 'redline' planning application area) is 15.18ha.

The Site is accessed from the existing SSE Tarbert entrances off the N67 to the power station site and would function independently of both the existing Tarbert HFO Power Station and the TEG Plant. The N67 connects Co. Kerry with Co. Clare and Co. Galway (via the Tarbert – Killimer ferry across the Shannon Estuary), running in a north-west to south-east direction.

13.4.2 Topography

A topographic survey was undertaken in 2023 for the Site, with contours produced for the Site of the Proposed Development, as presented in Appendix A of the Site-Specific Flood Risk Assessment (FRA) submitted with this planning application, refer to Appendix 12A, EIAR Volume II. Section 4.3.1 of the FRA indicates that the Proposed Development Site ranges from 3.08 to 4.83m AOD (Malin Head – current national datum).

13.4.3 Surrounding Land Use

Land use on and in a 2km radius surrounding the Site is summarised in Table 13.5.

Table 13.5: Adjacent Land Use⁷

Site Boundary	Land Use
North	Outbuildings, storage tanks, Tarbert Lighthouse and the Shannon Estuary.
South	Two ESB electrical transmission substations (110kV to southeast and 220Kv directly south and a lagoon south of the 220kV substation draining to the Shannon Estuary and with agricultural lands further south on the mainland
East	The northern site entrance and the Shannon Estuary. To the south-east are a reservoir, the Tarbert – Killimer ferry terminal and the N67 National Secondary Road.

⁷ Source: Google Maps (2022).

Site Land Use Boundary

West	Immediately west is the capped former landfill, the HFO fuel storage tanks and the jetty. To the south-west is the under-construction TEG site with the National Oil Reserves Agency (NORA) tankfarm further to the south-west on the mainland side of the lagoon.

13.4.4 Site History

OSI maps show that that historical land use at the overall SSE Tarbert site was largely as low-lying grassland and scrubland. The island portion of the SSE Tarbert site which includes the Proposed Development Site, was divided into fields, and included a lighthouse, several piers and slipways, a coastguard station and previous naval artillery facilities prior to the construction of the original Tarbert HFO Power Station. The Site is located on the southern shore of the Shannon Estuary, on Tarbert Island, originally agricultural land and made ground (i.e., infilled/reclaimed land), connected to the mainland via a causeway.

The Tarbert HFO Power Station was developed in the 1960's and has been operational since 1969.

There are four generating units at the Tarbert HFO Power Station, two with a capacity of 57MWe each and two with a capacity of 256MWe each. The Tarbert HFO Power Station was constructed in two stages:

- Units One and Two (both 57Mwe units) were commissioned in 1969 and are no longer used.
- Units Three and Four (both 256Mwe units) were commissioned in 1976 and 1977 respectively.

Units Three and Four were refurbished in 2003 and 2004 and are fuelled by HFO, with both Gas Oil and propane used as a start-up fuel.

Each of the units are independent and consist of a boiler, steam turbine and auxiliary plant.

There is an 'Island Tank Farm' adjacent to the location of the Proposed Development, which comprises four HFO tanks within the western boundary of the Proposed Development Site, each with the capacity of 25,000 tonnes. At present, only two of these tanks are in use, while the other two are currently not used. The tanks are filled from ship tanker via the jetty.

The mainland tank farm, located 410m to the south-west of the Proposed Development, is not related to the Tarbert HFO Power Station and is under the control of the National Oil Reserves Agency (NORA) providing a national fuel reserve.

On Site disposal of station waste was practised until the mid-1990s, with three waste disposal areas used over the Site's history. One of these areas is within the Proposed Development Site and capping works on these landfill areas was undertaken in 2006 and 2007 under EPA approval.

A number of localised incidents relating to HFO losses to ground are known to have occurred at the SSE Tarbert site, most recently one to the north-east of the turbine hall in May 2022 (within the Proposed Development Site).

A timeline of the SSE Tarbert site development and changes since it was developed from greenfield in 1966 is summarised in Table 13.6.

Table 13.6: Site Operational Timeline

Year	Discussion
1966	Construction started on the ESB Tarbert Power Station.
1969	ESB Tarbert Power Station Unit One and Two becomes operational.
1976/77	Units Three and Four operational
2003	ESB Tarbert receives its Industrial Emissions (IE) Licence from the EPA (P0607-01).
2005	ESB Tarbert receives its current IE Licence from the EPA (P0607-02).
2009	Power station sold by ESB to Endesa
2012	Power station sold by Endesa to SSE
2023	Cease operating at the end of December 2023.

13.4.5 Soils and Quaternary Deposits

GSI mapping indicates the entire island is underlain by Made Ground soil, with natural topsoil and subsoils in the surrounding area consisting of Till derived from sandstone and shale, refer to EIAR Volume III Figure 13.1.

Soils/subsoils, and potentially bedrock, are likely to have been removed or reworked in places during construction of the Tarbert HFO Power Station and facilities.

13.4.6 Bedrock

The GSI map indicates that bedrock geology underlying the site consists of the dark grey Shannon Group of undifferentiated mudstones, siltstones, and sandstones. Bedrock outcrops are shown along the shoreline to the north and west. Fault lines are not indicated to be present in the area. The bedrock geology is shown in EIAR Volume III Figure 13.2.

13.4.7 Hydrogeology

The bedrock aquifer underlying the Site is classified by the GSI as a 'Locally Important Aquifer (Li)' where the bedrock is moderately productive only in local zones. Groundwater elevations indicate that groundwater flow on Tarbert Island is radial towards the surrounding waterbodies (AECOM, 2022), with groundwater being brackish/saline (the 2023 site investigation reported groundwater chloride concentrations between 70 and 452 milligrams per litre – EIAR Volume II, Appendix 13A) and likely to be tidally-influenced. At the HVO power plant area groundwater flow is to the north and west.

The groundwater vulnerability beneath the Site is classified by GSI as 'Moderate' as shown in EIAR Volume III Figure 12.3.

The Site is not located in a groundwater source protection area.

Groundwater beneath the Site forms part of the Ballylongford groundwater body (code IE_SH_G_030), classified as a Poorly Productive bedrock aquifer. Under the most recent Water Framework Directive (WFD) data (2016-2021) groundwater quality for the Ballylongford groundwater body is classified by EPA as 'Good' but 'At Risk'

13.4.8 Groundwater Recharge

The average groundwater recharge rate according to the GSI Groundwater Data Viewer is 145mm/year at the Site.

13.4.9 Groundwater Abstractions

The closest groundwater abstraction for public supply is the former Glin Public Supply scheme, which consisted of two supply wells south-east of the village of Glin, approximately 6.5km from the Site. This public water supply is noted to be no longer in use.

A search of the GSI well database found three private well records within 2km of the Site:

- Borehole (0813NEW025) located at E107000, N148600, approximately 1km south of the Site, drilled to a depth of 12.2m, and with rockhead recorded at 28m, which appears to be a data entry error as it is deeper than the reported drilled depth. The use of the borehole is for agricultural and domestic purposes only and it is recorded as having a 'Poor' yield (16.4m³ per day).
- Borehole (0813NEW0145) located at E105650, N148280, approximately 1.5km south-west of the Site, drilled to a depth of 2.7m, with rockhead recorded at 30.5m, which again appears to be a data entry error as it is deeper than the reported drilled depth. The use of the borehole is for agricultural and domestic purposes only and it is recorded as having a 'Poor' yield (21.8m³ per day).
- Borehole (0813NEW095) located at E106770, N147470 (the former Tarbert Creamery), approximately 2km south of the Site. No depths are recorded for this borehole. The use of the borehole is for industrial purposes, and it is recorded as having had a 'Good' yield (216.0m³ per day).

It should be noted however, that the presence of additional private domestic wells in the vicinity of the Site cannot be ruled out, as these wells are not always identified fully on the GSI online mapping database. The necessity to register wells that have abstraction rates of 25m³/day or more with the EPA only came into effect in November 2018 and that well register has not yet been published.

However, due to the Site's coastal setting and absence of dwellings between the Site and the Shannon Estuary, groundwater at and in the vicinity of the Site is likely to be brackish and unsuitable for potable supply.

13.4.10 Protected Areas

A search of the EPA interactive map viewer revealed the following protected areas within a 2km radius of the Site:

- River Shannon and River Fergus Estuaries Special Protection Area (SPA) (Code: 004077) and the Lower River Shannon Special Area of Conservation (SAC) (Code: 002165) border Tarbert Island on all sides.
- Tarbert Bay proposed Natural Heritage Area (pNHA) (Code:001386), 0.3km south-east of the Site.

13.5 Site Investigation

Several site investigations have been conducted at the SSE Tarbert Site as a whole and relevant information is summarised in the following sections.

13.5.1 2009 Site Investigation

URS Ireland Limited (now AECOM) undertook Phase 1 and Phase 2 Environmental Site Assessment (ESA) at the ESB Tarbert Power Generating Station in 2008 and 2009 on behalf of ESB, as part of the site divestment due diligence process at the Site (refer to EIAR Volume II, Appendix 13B).

The phased intrusive site investigations consisted of hand augering, test pitting and bore drilling. Monitoring wells were installed at strategic locations and groundwater samples were collected. Samples of soil, sediment, surface water and groundwater were analysed for a broad range of potential contaminants of concern.

The site investigations completed on the island portion of the SSE Tarbert site found bedrock, consisting of dark grey shale or siltstone with an upper weathered horizon, was generally encountered at shallow depths, <3.0m below ground level (bgl), across the Site. Bedrock strata on the east side of the island dip gently (at approximately 25°) towards the east.

At the Proposed Development Site, depth to the top of rock changed markedly to the north-west of the current boiler hall, from approx. 1m bgl (at locations 2009 site investigation locations BH304, BH305, BH307, BH308) to more than 4m bgl (at BH313, BH315, BH316, 30-40m to the north-west). In deeper boreholes by the coast (BH309A, BH311, BH319) bedrock was between 5.5 and 9.3m bgl (refer to EIAR Volume II, Appendix 13B Figure 2).

Bedrock was directly overlain by compacted sand and gravel fill material at most locations. Stiff grey sandy gravelly or dark brown peaty clay subsoils underlaid the fill material at BH313, BH316 and BH320 and gravel and peat were encountered below the fill at TP08, TP10, BH315 and BH333.

Oily contamination was reported from trial pit soils (at TP08) and foreshore sediments (SED05) at the Heavy Waste Area, to the north-west of and outside of the Proposed Development Site (though not in groundwater from nearby well BH319). This localised contamination was thought to result from the previous practice of storing items of redundant plant and machinery in this area of unsealed ground.

A 4000 Litre diesel underground tank outside the mechanical workshop was noted to have been decommissioned in 2001.

Soils within the Site showed some slightly elevated hydrocarbon and heavy metals concentrations which exceeded the Generic Assessment Criteria (GAC) used to screen the data. Some of these GAC exceedances were considered to be due to natural background soil chemistry conditions in the wider area, but others suspected to be due to ash deposition and disposal of boiler washings on the power station site historically, however it was considered unlikely that these findings would represent significant liability issues.

No remedial action was considered necessary at the Site under a continued industrial land use scenario, from the perspective of environmental soil and groundwater quality.

13.5.2 2022 Targeted Site Investigation

A site investigation on the island was overseen by AECOM Ireland Limited in 2022 following a loss to ground of HFO due to pipe clamp failure on the north side of the Turbine Hall adjacent to north-east side of the Station A Chimney in April 2022 (reported to EPA as Incident Ref: INC1023056) (refer to EIAR Volume II Appendix 13C).

This site investigation and source removal was conducted by a combination of hand excavation (April 2022) and vacuum excavation (June 2022) to delineate the extent of hydrocarbon impacts to grounds.

Bedrock was encountered within 1-2m of the surface at the carpark north-east of the turbine hall, however up to 6.5m of subsoil was previously encountered in borehole BH9, adjacent to the 220kV switching yard on the south-west portion of the island, suggesting quite variable top of bedrock elevations across the island.

Analytical results for samples of the soils remaining in situ did not exceed GAC protective of human health on a commercial / industrial site. Analytical results for soil leachate from those samples indicate limited exceedances of GAC protective of controlled waters (reported concentrations <100 times GAC).

Downgradient monitoring well 309A was also sampled as part of this study and, with concentrations of some aromatic fractions and of C₃-C₃₅ TPH exceeding the relevant GAC protective of groundwater. Due to the lack of any historic monitoring data for BH309A, it was not determined whether these detections were directly related to the 2022 HFO loss. AECOM considered that the absence of aliphatic hydrocarbons in the groundwater sample (which were detected in the source area soil samples, and which tend to be more soluble than the aromatic hydrocarbon fractions) indicated that the detection of hydrocarbons in groundwater at BH309A in 2022 was likely related to an older source.

13.5.3 2023 Site investigation

An intrusive geo-environmental site investigation was completed on the Site in July and August 2023 within the Proposed Development area to obtain recent soil and groundwater quality information to validate the use of the above 2009 soil and groundwater dataset (refer to Appendix 13A, EIAR Volume II).

As part of this 2023 site investigation, two monitoring wells (MW410 and MW402) were installed and four trial pits (TP101 to TP104) were completed in late July 2023 and groundwater samples were collected from both wells in early August 2023.

The purpose of this geo-environmental site investigation was to assess data gaps in relation to site geology and groundwater quality identified following historic site investigations and update historical geo-environmental findings with current soil and groundwater data.

The soils investigation concluded that:

- There was no visual or olfactory evidence of gross contamination at any of the sample locations (see EIAR Volume II, Appendix 13A Figure 1).
- Asbestos and Polychlorinated Biphenyls (PCBs) were not detected in any of the soil samples collected.

- Trace level concentrations of Volatile Organic Compounds (VOCs), Polycyclic Aromatic Hydrocarbons (PAHs), phenols and Total Petroleum Hydrocarbons (TPHs) were detected in one or more soil sample locations, but at concentrations significantly below relevant soil GAC.

Groundwater samples were collected from both newly installed wells (MW401 and MW402) and the groundwater assessment concluded that:

- VOCs, PAHs, PCBs and TPH were below laboratory Method Detection Limits (MDLs) in both groundwater samples collected.
- Where detected, PFAS, metals and major ions were below all relevant GAC in groundwater, with the exception of the following:
 - Marginal to minor GAC exceedances of arsenic were reported in the two groundwater samples.
 - Ammoniacal nitrogen exceeded the interim Guideline Value (IGV) and Groundwater Threshold Value (GTV) GACs at MW401 in the former contractor compound only.
 - Chloride exceeded the IGV and GTV in groundwater from both monitoring wells. Chloride exceedances are likely to be due to the site's coastal setting.
 - Faecal coliform detections in both groundwater samples indicate possible losses from on-Site foul sewer drainage.

A Conceptual Site Model (CSM) and a Qualitative Environmental Risk Assessment were developed by AECOM based on the results of the 2023 geo-environmental site investigation and historic investigations.

There were no sources of contamination in excess of human health criteria in soils.

Groundwater on the Site is not suitable for potable water use, given elevated salinity (as indicated by elevated chloride concentration in groundwater at well MW401) related to the Site's proximity to coastal waters, therefore there is no pathway to on-site humans for faecal coliforms or PFAS in groundwater.

Historic site investigation reports (URS, 2009 and AECOM, 2022) had identified metals and TPHs in soils as a potential risk to controlled waters receptors. The estimated soil GACs for the suite of heavy metals are calculated using conservative soil: water partitioning coefficients and result in theoretical soil leaching values for metals that are likely to be very conservative. Therefore, greater reliance has been placed on actual, site-specific, measured concentrations of these substances in groundwater, if available, to assess the potential risks to Controlled Waters in the vicinity of the Site.

TPHs and all metals in groundwater, with the exception of arsenic, in the 2023 site investigation were below GAC protective of controlled waters. Arsenic is inferred to be naturally occurring in groundwater beneath the Site, derived from the shale bedrock.

Based on the above assessment, the risk to human health and controlled waters receptors is assessed as **Low**.

Existing buildings and services in the area to the north of the main Tarbert HFO Power Station building prevented soil sampling from taking place in this section of the Proposed Development. Soil samples

will be collected from this area of the Site as part of confirmatory site investigations following the pre-construction decommissioning and demolition of these buildings and other infrastructure under the EPA-approved Residual Management Plan (RMP), to confirm this CSM.

13.6 Potential Impacts

The Proposed Development comprises an Open Cycle Gas Turbine (OCGT) generator (350MW output) fuelled by HVO, and all associated ancillary connection infrastructure, site works and services (refer to EIAR Volume I Chapter 5).

The Proposed Development includes new HVO storage tanks (three tanks in total, one x 1500m³ and two x 4,400m³) with a land based unloading facilities.

The Proposed Development is located in an area that is determined from previous site investigations to be composed of 1-3m thickness of sand and gravel fill material overlying either bedrock or clay-dominated subsoils.

A qualitative approach was used to determine the significance of effects as per the EPA Guidelines determination figure (Figure 3.4; page 53⁸). Due account was taken of both the sensitivity of the attributes (refer to Table 13.1) and the description of the potential effect.

13.6.1 Construction Phase

The potential construction phase impacts to geology, land, and soils (including pre-construction decommissioning and demolition activities) include the following:

- Accidental spills and leaks of oils and chemicals, which could impact soils and groundwater.
- Excavation and infilling of ground, which may lead to exposure of potentially contaminated subsoils, increased rainwater infiltration and the mobilisation of contaminants to groundwater.
- The depletion of non-renewable natural resources to be imported as aggregates and fill materials.
- The use of concrete and lime in construction works, which has the potential to impact the pH of groundwater.

13.6.1.1 Accidental Spills and Leaks

During the construction phase of the Proposed Development (which includes demolition and removal of ancillary buildings/structures associated with the existing Tarbert HFO Power Station), there is a risk of accidental pollution incidents from the following sources:

- Spillage or leakage of chemicals stored and used on-site or as part of construction works, particularly in relation to decommissioning and demolition of pre-existing chemical or fuel storage and conveyance infrastructure to be conducted under the IEL RMP agreed with the EPA.
- Spillage or leakage of oils and fuels from construction machinery or site vehicles.

⁸ EPA (2022).

- Spillage of oil or fuel from refuelling machinery on-site.

Accidental spillage of fuels or chemicals could potentially result in the impact of soils and groundwater underlying the Site if inappropriately handled or stored, during construction. Potential contaminants could migrate through the subsoils and impact underlying groundwater.

Groundwater wells have been identified within a 2km radius of the Site, as per Section 13.4.7. However, it is noted that the Proposed Development is located on an island and groundwater flow direction is therefore radially towards the Shannon Estuary, so any accidental spillages of fuels or chemicals will not impact wells on the mainland. Any water quality impacts from the Proposed Development on mainland groundwater receptors is therefore considered unlikely.

However, the potential for impact to the aquifer exists, the quality of which will be considered under the WFD but which groundwater monitoring in 2023 has indicated is not of potable quality, due to the Site's coastal setting.

This is considered a direct negative effect and, if it occurs, would be confined to one-off releases. The impact could alter the character of soil and / or groundwater at the Site but would be temporary in nature. The impact would therefore result in a small effect on a **Low** sensitivity soil environment and the significance of the effect is **Imperceptible** with regard to soils.

It is considered to be a **Low** effect on a **Medium** sensitivity marine environment and the significance of the effect is **Slight** with regard to groundwater.

13.6.1.2 Excavation and Infilling

Construction earthwork impacts will mainly relate to removal of topsoil and shallow subsoils, while infill earthwork will mainly relate to the import and compaction of acceptable fill material to achieve the required engineering design and grades.

The Proposed Development will have a negative net cut / fill balance of up to 38,053 tonnes of fill material during the first six weeks of construction.

Excavation earthwork impacts will mainly relate to removal of topsoil and shallow subsoils, while infill earthwork will mainly relate to the import and compaction of acceptable fill material to achieve the required engineering design and grades. Stockpiling of unsuitable soils will be undertaken prior to removal from the Site. In the absence of mitigation, this would have the potential to impact on soil and groundwater, through the leaching of contaminants.

The removal of hardstanding during construction works may also expose potentially contaminated shallow soils to rainwater infiltration, increasing the potential for leaching of contaminants to groundwater. Previous site investigation soil sample analysis results and the results of the targeted 2023 geo-environmental site investigation (refer to Appendix 13A, EIAR Volume II) did not indicate any significant soil contamination at the Site with the potential to be leached and mobilised, indicating a low risk of potential impact to groundwater quality or to the Shannon Estuary via groundwater flow.

Where removal of the existing granular fill material is required, it will be replaced by fill material and paved surfaces / buildings, therefore groundwater vulnerability is unlikely to change from the current 'Moderate' assessment.

Excavation and infilling impacts will result in a permanent direct negative effect which is certain to occur and irreversible. This is considered to be a **Medium** effect on a soil and groundwater environment of **Medium** sensitivity and the significance of the effect is considered **Moderate**.

13.6.1.3 Use of Natural Resources

It is expected that there will be a requirement for import of 'clean', imported fill material for the Proposed Development. The source of imported fill material will involve careful selection and vetting in order to check that it is of a known origin and that it is 'clean' (i.e., will not cause contamination to the environment).

Aggregates will be imported to the Site for use in the establishment of contractor's compounds, and in fill placement and construction. The sourcing of these aggregates will be via importation of recycled aggregate material, as an alternative to primary aggregate (with procedures to ensure it is uncontaminated) or as primary aggregate from reputable, authorised quarries. Sourcing of uncontaminated fill materials is mandated by development requirements and for ensuring regulatory compliance and will be carried out. Potential local sources of primary aggregates include:

- Listowel Quarry (Shale, GSI ID 179, Quarry Number KY006, 17km from Site)
- Michael O'Donovan Quarries, Knockbweeheen, Co. Limerick (Shale, GSI ID 189, Quarry Number LK005, 20km from site)
- Knockbowheen Quarry, Knockbweeheen, Co. Limerick (Shale, GSI ID 188, Quarry Number LK004, 20km from site)
- Roadstone Barrigone Quarry, Askeaton, Co. Limerick (Limestone, GSI ID 115, Quarry Number LK008, 22km from site)
- Hogan's Quarry, Foynes, Co. Limerick (Limestone, GSI ID 125, Quarry Number LK009, 22km from site)
- Creeves Quarry, Shanagolden, Co. Limerick (Limestone, GSI ID 122, Quarry Number LK010, 22km from site)

Primary aggregates are natural non-renewable resources and their use results in depletion of the national stock of these resources. Use of natural resources is therefore considered a permanent direct impact of neutral quality which will be imperceptible on the quality or character of the wider environment but is certain to occur and irreversible. The use of natural resources is considered to be a **Low** impact on a soil environment of **Medium** sensitivity and the significance of the impact is considered **Slight**.

13.6.1.4 Use of Concrete and Lime

Lime and concrete (specifically, the cement component) is highly alkaline and any spillage which migrates through subsoil could impact groundwater quality. The activities most likely to result in contamination include concreting during foundation construction and laying of services.

As noted previously, any impacts are considered unlikely to impact on identified groundwater wells but may impact the WFD groundwater body (IE_SH_G_030).

The impacts will result in a direct negative effect but are unlikely to occur and, if they occur, would be confined to one-off releases. The impact could alter the character of soil and / or groundwater local to the Site but would be **Temporary** in nature. Therefore, it is considered to be a **Low** effect to a **Medium** sensitivity environment and the significance of the effect is **Slight**.

13.6.1.5 Land Use

The land use on the Site is industrial, as it is associated with power generation. Therefore, there are no effects associated with the change of land use.

13.6.2 Operational Phase

The potential impacts during the operational phase include the following:

- Accidental spills and leaks from fuel storage impacting soils and groundwater.

13.6.2.1 Accidental Spills and Leaks

There is the potential for accidental spills and leaks to occur from chemical storage, fuel storage and from vehicles using the Proposed Development during its operation. Accidental spills/leaks of chemicals may be associated with the water treatment plant, selective catalytic reduction (SCR) operation, lubricants (oils/greases), cleaning/sanitation chemicals and other significant chemicals (ammonia) to be used on Site.

All tanks containing liquids whose spillage could be harmful to the environment will be bunded. No tanks or pipework containing liquids such as fuel, oils or chemicals will be stored below ground. HVO fuel storage facilities and the road tanker fuel unloading area will be bunded, notwithstanding the fact that HVO is significantly less environmentally harmful to the environment in the event of a loss to ground than conventional hydrocarbon fuels. Drainage from paved areas will be collected and directed to interceptors prior to discharge, as such any accidental spill would be prevented from direct discharge to surrounding soils and groundwater.

The impact is considered a direct negative impact but unlikely to occur with the embedded mitigation measures. If it does occur, it would be confined to one-off releases. The impact has the potential to alter the character of soil and / or groundwater at the local Site but would be temporary in nature. Therefore, it is considered to be a **Low** impact on a **Medium** sensitivity environment and the significance of the impact is **Slight**.

13.6.3 Decommissioning Phase

Effects arising from the process of decommissioning of the Proposed Development are considered to be of a similar nature and duration to those arising from the construction phase and have therefore not been considered separately.

13.6.4 Do Nothing Scenario

The 'do nothing' alternative describes the circumstance where no development occurs. Under a 'do nothing' scenario, the land remains in its current use and no likely significant implications arise in respect of soil, geology, or hydrogeology. In this case, any future decommissioning of existing facilities would be managed under the IE licence via the EPA-approved RMP.

13.7 Mitigation Measures

This section describes a range of recommendations and mitigation measures designed to avoid, reduce, or offset any potential adverse geological impacts identified.

Due to the inter-relationship between soils, hydrogeology, surface water and biodiversity, the mitigation measures discussed within this chapter should be read in conjunction with Chapter 9 Biodiversity and Chapter 12 Water Environment, EIAR Volume I.

13.7.1 Construction Phase

In order to reduce the impacts on the soils, geology and hydrogeological environment a number of mitigation measures will be adopted as part of the construction works (including demolition activities) on-site as described in EIAR Volume II Appendix 5A CEMP. The measures will address the main activities of potential impact.

13.7.1.1 Fuel and Chemical Handling, Transport and Storage

The following mitigation measures will be taken at the Site in order to prevent any spillages to ground of fuels and prevent any resulting soil and / or groundwater quality impacts:

- designation of bunded refuelling areas on the Site;
- provision of spill kit facilities across the Site;
- where mobile fuel bowzers are used the following measures will be taken:
- any flexible pipe, pump, tap or valve will be fitted with a lock and will be secured when not in use;
- all bowser units will carry a spill kit and operatives will have spill response training; and
- portable generators or similar static operation fuel containing equipment will be placed on suitable drip trays.

13.7.1.2 Excavation and Infilling

13.7.1.2.1 Control of Soil Excavation and Export from Site

Topsoil and subsoil will be excavated to facilitate the construction of foundations, sewers, drainage, roadways, and all other associated services.

The Proposed Development will incorporate the; reduce, reuse, and recycle approach in terms of soil excavations on-site. The construction will be carefully planned to ensure only material required to be excavated will be excavated, with as much material left in-situ as possible. All excavation arisings will be reused on-site where possible / if suitable.

Soil stripping, earthworks and stockpiling of soil will be carried out during the works. Stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated through the implementation of an appropriate earthworks handling protocol during construction. As described in the CEMP, it is anticipated that only local / low level of stockpiling

will occur as the bulk of the material will be excavated either straight into trucks for transport off site or will be reused in other areas of the Site as fill.

Dust suppression measures (e.g., damping down during dry periods), vehicle wheel washes, road sweeping, and general housekeeping will ensure that the surrounding environment are free of nuisance dust and dirt on roads.

13.7.1.2.2 Export of Surplus Material from Site

Where material cannot be reused onsite, it will be sent for recovery / disposal at an appropriately permitted / licenced site however, as indicated in Chapter 18 Waste Management (EIAR Volume I) and the CEMP (EIAR Volume II Appendix 5A) the Final / Contractor's CEMP will be produced by the contractor appointed by the Applicant to undertake the construction of the Proposed Development. By implementing the measures set out in the following sections, the Final CEMP will help to manage environmental issues appropriately during construction. Submission and approval of the Final / Contractor's CEMP prior to commencement of construction is proposed to be secured by a condition.

Detailed provisions of off-site management of excavation waste will be provided in the Final / Contractor's CEMP and Resource Waste Management Plan (RWMP).

13.7.1.2.3 Control of Water during Construction

Run-off from excavations / earthworks cannot be prevented entirely and is largely a function of the prevailing weather conditions. Earthwork operations will be carried out such that surfaces, as they are being raised, shall be designed with adequate drainage, falls and profile to control run-off and prevent ponding and flowing. Care will be taken to ensure that exposed soil surfaces are stable (in terms of angle and compaction) in order to minimise erosion. All exposed soil surfaces will be within the main excavation site, which limits the potential for any offsite impacts. Any run-off will be prevented from directly entering any watercourses.

Should any discharge of construction water be required during the construction phase, discharge to foul sewer will be regulated under a Discharge Licence obtained from the Regulator (Irish Water) issued under the Water Pollution Act. Attenuation, pre-treatment and monitoring of discharge water will likely be required under any Discharge Licence (Section 16 Licence).

Pre-treatment and silt reduction measures on-site will include some combination of silt fencing, settlement measures (silt traps, silt sacks and settlement tanks) and hydrocarbon interceptors. Active treatment systems such as Siltbusters or similar may be required depending on turbidity levels and discharge limits. Qualitative and quantitative monitoring will be implemented as per EPA requirements. The Applicant's environmental consultant will audit the sampling and analysis results as required to ensure conformance to the applicable IE Licence discharge licence limits and testing frequency requirements.

13.7.1.3 Sources of Fill and Aggregates for the Proposed Development

All fill and aggregate for the Proposed Development will be sourced from reputable suppliers as per the project Contract and Procurement Procedures. All suppliers will be vetted for:

- Aggregate compliance certificates / declarations of conformity for the classes of material specified for the Proposed Development.
- Environmental management status.
- Regulatory and legal compliance status.

Potential local sources of aggregates include:

- Listowel Quarry (Shale, GSI ID 179, Quarry Number KY006, 17km from Site)
- Michael O'Donovan Quarries, Knockbweeheen, Co. Limerick (Shale, GSI ID 189, Quarry Number LK005, 20km from Site)
- Knockbowheen Quarry, Knockbweeheen, Co. Limerick (Shale, GSI ID 188, Quarry Number LK004, 20km from Site)
- Roadstone Barrigone Quarry, Askeaton, Co. Limerick (Limestone, GSI ID 115, Quarry Number LK008, 22km from Site)
- Hogan's Quarry, Foynes, Co. Limerick (Limestone, GSI ID 125, Quarry Number LK009, 22km from Site)
- Creeves Quarry, Shanagolden, Co. Limerick (Limestone, GSI ID 122, Quarry Number LK010, 22km from Site).

13.7.1.4 Control of Concrete and Lime

Ready-mixed concrete will be brought to the Site by truck. There will be no onsite batching of concrete. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated water to the underlying subsoil and groundwater.

Washout of concrete transporting vehicles will take place at an appropriate facility, offsite where possible. Alternatively, where wash out takes place on-site, it will be carried out in carefully managed designated on-site wash out areas.

13.7.1.5 Construction Environmental Management Plan

A Construction Environmental Management Plan (CEMP) (refer to Appendix 5A, EIAR Volume II) and Resource and Waste Management Plan (RWMP) (Appendix 18A, EIAR Volume II) has been prepared as part of the planning application. In advance of work starting on-site, the appointed Contractor will expand and develop the CEMP into a Final/Contractor's CEMP, taking into account any additional requirements of the Design Team or Planning Conditions.

The CEMP sets out the overarching vision of how the construction of the Proposed Development will be managed in a safe and organised manner by the appointed Contractor with the oversight of the Developer. The CEMP is a live document, and it will go through a number of iterations before works commence and during the works incorporating the commitments provided in this planning application unless otherwise agreed with the local authority. It will set out requirements and standards which must

be met during the construction phase and will include the relevant mitigation measures in the EIAR and any subsequent conditions relevant to the Proposed Development.

13.7.2 Operational Phase

The Proposed Development will incorporate mitigation measures for potential spills of fuel and / or chemicals, including bunding, secondary containment, interceptors, and monitoring, in accordance with best practices which will reduce the impact of such events if they occur.

13.7.3 Decommissioning Phase

As outlined in EIAR Volume I Chapter 5 (Description of the Proposed Development), in the event of decommissioning, measures will be undertaken to ensure that there will be no significant, negative environmental effects from the development.

13.8 Residual Impacts

13.8.1 Construction Phase

Considering the implementation of the mitigation measures set out in Section 13.7.1, construction phase impacts are assessed to be a **Negligible** impact on a **Medium** sensitivity receptor. The residual impact on land, soil and groundwater environment is therefore **Imperceptible**.

13.8.2 Operational Phase

Considering the implementation of the mitigation measures set out in Section 13.7.2, operational phase impacts are assessed to be a **Negligible** impact on a **Medium** sensitivity receptor. The residual impact on land, soil and groundwater environment is therefore **Imperceptible**.

13.8.3 Decommissioning Phase

As outlined in EIAR Volume I Chapter 5 (Description of the Proposed Development), in the event of decommissioning, measures will be undertaken to ensure that there will be **No Significant, Negative** residual environmental effects from the development. Additional potential impacts and associated effects arising during the decommissioning phase are not anticipated above and beyond those already assessed during the construction phase of the Proposed Development.

13.9 Cumulative Impacts

A search of planning applications within 5km of the Site is presented in Chapter 4 Section 4.5.1. Applications of note that could give rise to cumulative effects on lands, soils, and geology. include a number of power infrastructure project at or in the vicinity of the SSE Tarbert site:

- EE08.3158 – SSE - The development of a Temporary Emergency Generation (TEG) facility at Tarbert Island adjacent to the Proposed Development under Section 4 of the Development (Emergency Electrical Generation) Act 2022 - Granted Conditional 29/03/2023;
- 18392 – SSE Renewables (Ireland) Limited - The development of a Battery Energy Storage System (BESS) at Tarbert Island - Granted Conditional 15/01/2019

- 18520 – ESB - The development of a c7.5 MW capacity Battery Energy Storage System (BESS); and
- 19746 - Moneypoint Synchronous Condenser - Granted Conditional 20/11/2019.
- ABP-305271-19 EirGrid 220kV cable replacement project

Should these developments be constructed at the same time as the Proposed Development, there is a potential for cumulative effects associated with the use of natural resources and accidental spills and leaks.

As reported in Section 13.8.1, potential emissions to soil and groundwater associated with the Proposed Development will be mitigated to the extent that the impact will not be significant. The committed developments listed above have also gone through the planning process, will also implement standard and best practice mitigation measures to the extent that impacts are not significant and are not considered to have a cumulative impact in terms of land, soils or geology impacts relative to the Proposed Development and therefore the cumulative impact will **not be significant**.

13.10 Summary

In summary:

- During the construction phase, potential impacts include accidental spills and leaks of fuels and chemicals, mobilisation of contaminants during excavation and infilling, the depletion of natural resources and potential for pH changes to water due to use of concrete and lime. The significance of effects was assessed as follows prior to mitigation:
 - A slight effect to soil and groundwater from accidental spillage and leaks of fuels and chemicals during construction.
 - A moderate effect on soil and groundwater associated with excavation and infilling works.
 - A slight impact associated with the depletion of non-renewable natural resources namely the use of aggregates as fill and the use of concrete.
 - A slight effect from local temporary pH alterations of groundwaters resulting from the use of concrete and lime.
- During the operational phase, a potential slight effect has been identified with respect to the soil and groundwater associated with accidental spills and leaks.
- Mitigation (including embedded mitigation) will ensure soils and groundwater are protected from adverse impacts of construction, operation, and decommissioning.
- It is considered that residual negative effects of the Proposed Development on land, soils and groundwater will overall be imperceptible provided that appropriate mitigation measures are implemented.
- It was concluded based on site locations and proposed mitigation measures that cumulative effects in relation to land, soil and geology will be not significant.

Table 13.7: Summary of Impacts and Mitigation

Phase	Activity	Mitigation
Construction	Discharge of contaminated water	Any discharge of construction water be required during the construction phase, discharge to foul sewer will be regulated under a Discharge Licence obtained from the Regulator (Irish Water) issued under the Water Pollution Act.
Construction	Storage of Hazardous Material / Accidental Spills	Good housekeeping and proper handling, storage and disposal of any potentially polluting substances will prevent soil and / or water contamination. Designated and bunded storage areas will be maintained.
Construction	Import / Export of Materials	All suitable surplus subsoil, if any exists, will be exported for reuse off site where a suitable reuse site can be identified. Soil reuse will be subject to the requirements under the Waste Management Act (e.g., Article 27 or 28). Where material cannot be reused it will be recovered or disposed of in accordance with the Waste Hierarchy and Waste Management Act. Aggregates will be required for sub-base under roads and buildings. All sub-base materials must meet the relevant engineering specification. The use of recycled or secondary aggregates will be considered as a replacement for primary aggregates.
Construction and Operational	Potential contaminated run-off percolating to ground and the underlying aquifer	There will be no direct discharge to groundwater during construction. Protection of groundwater from potentially polluting substances will be dealt with through a number of measures including correct handling and storage of potentially polluting substances. Concrete use and wash-out areas will be in designated areas, with measures to prevent alkaline wastewaters or contaminated storm water runoff to the underlying subsoil or to the surface water or marine environment.
Decommissioning	Effects arising from the process of decommissioning of the Proposed Development are considered to be of a similar nature and duration to those arising from the construction phase and have therefore not been considered separately.	
Operational / Unplanned Events	Storage of hazardous material	Good housekeeping and proper handling, storage and disposal of any potentially polluting substances can prevent soil and / or water contamination. Designated and bunded storage areas will be maintained. Integrity testing of fuel tanks will mitigate against any risk of leaks.

13.11 References

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SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 14 Traffic and Transport

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November 2023

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Table of Contents

14.	Traffic and Transport	14-1
14.1	Introduction	14-1
14.2	Legislation, Policy and Guidance	14-1
14.3	Methodology	14-2
14.4	Baseline Environment.....	14-4
14.5	Predicted Impacts	14-9
14.6	Mitigation Measures	14-16
14.7	Residual Impacts	14-18
14.8	Cumulative Impacts	14-19
14.8.1	Cumulative Assessment	14-21
14.9	Summary	14-21
14.10	References	14-23

Tables

Table 14.1:	Potential Effect Parameters.....	14-2
Table 14.2:	TII Counter Data for weeks Prior to the Survey Day	14-7
Table 14.3:	Development Phases	14-11
Table 14.4:	Daily Traffic Generation Estimated at the Site (Arrivals).....	14-12
Table 14.5:	Percentage Impact during the Construction Phase of Development	14-14
Table 14.6:	AADT Road Capacity Assessment	14-15
Table 14.7:	Residual Impacts	14-18
Table 14.8:	Development Considered for Cumulative Impacts	14-19
Table 14.9:	Cumulative Assessment	14-21

Plates

Plate 14.1: Road Network within the Study Area (Source:Google Earth)

Plate 14.2: L1010 Coast Road

Plate 14.3: Advisory walkways on N67

Plate 14.4: Road Collision Data (Source: Road Safety Authority)

Appendices (Refer to EIAR Volume II)

Appendix 14A: Survey Data

Appendix 14B: Construction Traffic Management Plan

Figures (Refer to EIAR Volume III)

Figure 14.1: Survey Locations

Figure 14.2: Site Access Locations

Figure 14.3: Car Parking Locations

14. Traffic and Transport

14.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) describes the transportation impacts of the construction, operational and decommissioning phases of the Proposed Development and their likely significant environmental effects on the environment.

The assessment is undertaken in accordance with the requirements of the Environmental Protection Agency (EPA) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (May 2022).

To assist in determining the impact of the Proposed Development on the surrounding road network, the following guidance has also been adhered to: Transport Infrastructure Ireland (TII) standard 'PE-PDV-02045, Traffic and Transport Assessment Guidelines' (May 2014).

This chapter also sets out measures and strategies to mitigate any significant effects.

Full details on the background and Site history are provided in Chapter 4 (Existing Site and Conditions) and details of the Proposed Development are presented in Chapter 5 (Description of the Proposed Development) and the Planning Statement submitted with this planning application.

14.2 Legislation, Policy, and Guidance

The following is a list of sources of information consulted for use, and the following guidance was adhered to, in this chapter:

- Kerry County Development Plan 2022 – 2028.
- Limerick County Development Plan 2022-2028
- Kerry County Zoning and Landscaping Maps, Map 12.1a, 2022 – 2028.
- Listowel Municipal District Local Area Plan 2020 – 2026.
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, May 2022).
- Traffic Signs Manual, (Department of Transport, Tourism and Sport, August 2019).
- PE-PDV-02045, Transport Assessment Guidelines, (TII, May 2014).
- PE-PAG-02016, Project Appraisal Guidelines for National Roads Unit 5.2 – Data Collection (Transport Infrastructure Ireland, October 2016).
- PE-PAG-02017, Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (Transport Infrastructure Ireland, May 2019).
- PE-PAG-02039, Project Appraisal Guidelines for National Roads Unit 16.1 – Expansion Factors for Short Period Traffic Counts (Transport Infrastructure Ireland, October 2016).

- DN-GEO-03031, Rural Road Link Design (Transport Infrastructure Ireland, June 2017).
- DN-GEO-03060, Geometric Design of Junctions (Priority junctions, direct accesses, roundabouts, grade separated, and compact grade separated junctions (Transport Infrastructure Ireland, June 2017).
- The Design Manual for Urban Roads and Streets, (Department of Transport, Tourism and Sport, May 2019); and
- National Development Plan (Department of Public Expenditure and Reform, February 2021-2030).

14.3 Methodology

14.3.1 Desktop and Site Audit Assessment

A desktop assessment was undertaken to identify the policy and best practice guidance that is relevant to traffic and transport, to describe the baseline traffic conditions, and to identify the potential impacts of the Proposed Development upon the surrounding road network.

To inform the baseline traffic conditions, traffic surveys were undertaken during the week beginning Monday 15 May 2023. These are discussed in detail in Section 14.4.2.

14.3.2 Significance of Impacts Methodology

In accordance with the EPA (2022) Guidelines, potential effects are characterised by considering parameters shown in Table 14.1.

Table 14.1: Potential Effect Parameters

Potential Effect Parameter	Description
'Quality' of Effects	Positive Effects – A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities). Neutral Effects – No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error. Negative / Adverse Effects – A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Significance of Effects	Imperceptible – An effect capable of measurement but without significant consequences. Not significant – An effect which causes noticeable changes in the character of the environment but without significant consequences. Slight Effects – An effect which causes noticeable changes in the character of the environment without affecting its sensitivities. Moderate Effects – An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends. Significant Effects – An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment. Very Significant – An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment. Profound Effects – An effect which obliterates sensitive characteristics.
Extent and Context of Effects	Extent – Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.

Potential Effect Description Parameter

	Context – Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?).
Probability Only Likely (and Significant) effects are assessed in this chapter	Likely Effects – The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented. Unlikely Effects – The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Frequency and Timing	Momentary Effects – lasting from seconds to minutes. Brief Effects – lasting less than a day. Temporary Effects – lasting less than a year. Short-term Effects – lasting one to seven years. Medium-term Effects – lasting seven to fifteen years. Long-term Effects – lasting fifteen to sixty years. Permanent Effects – lasting over sixty years. Reversible Effects – that can be undone, for example through remediation or restoration. Frequency of Effects – Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly -or hourly, daily, weekly, monthly, annually).

14.3.3 Significance of Effects

A qualitative approach was used in this evaluation, generally following the significance classification in Table 14.1 and through professional judgement. The significance of a predicted impact is based on a combination of the sensitivity or importance of the attribute and the predicted magnitude of any effect. The effects are identified as beneficial, adverse, or negligible, temporary, or permanent and their significance as major, moderate, minor or not significant (negligible).

As outlined in EIAR Chapter 1, once the description of the effect, including magnitude, character, duration etc. has been identified, this can be cross-referenced with the importance of the sensitivity of the receptor to derive the overall significance of effect as per the EPA Guidelines¹.

14.3.4 Study Area Description

The study area for this chapter was established based on the anticipated routing to the Proposed Development Site for construction and operational vehicles at points in which traffic is likely to be most intensive, e.g., in proximity to the Proposed Development Site. The N67 (north of Tarbert town) and its junction with the N69 therefore represents the study area for this assessment. Two existing access and egress points to the SSE Tarbert Site will be utilised for the Proposed Development which are both located off N67.

A full description of the Proposed Development Site is provided in EIAR Volume I Chapter 5 (Description of the Proposed Development).

¹ EPA (2022).

14.4 Baseline Environment

14.4.1 Existing Road Network

This section sets out transport characteristics of the study area environment. The receiving environment has been categorised under the following headings:

- Road Network.
- Road Safety.
- Walking Infrastructure.
- Cycling Infrastructure; and
- Bus and Ferry Transport.

14.4.1.1 Road Network

Plate 14.1 provides an overview of the road network within the study area.



Plate 14.1: Road Network within the Study Area (Source: 2023)

L1010 (Coast Road)

The L1010 (Coast Road) is a local road which connects with the R551/ N67 in Tarbert and the R551/ R552 in Ballylongford Village. The L1010 is single lane carriageway and subject to a 50km/hr speed limit on the approaches to Tarbert and Ballylongford, increasing to 80km/hr outside of these areas.

A section of the L1010 is currently subject to a highway improvement scheme by Kerry County Council (KCC). This road improvement starts approximately 700m west of the R551/N67/ L1010 priority junction and travels west for approximately 3.5km. It is anticipated that these improvements (road widening) will be complete prior to the commencement of the Proposed Development main construction elements.

The existing L1010 is approximately 5.5m wide increasing to approximately 6m in the environs of Tarbert and Ballylongford. No designated footpaths or cycleways or public lighting are present along the rural section of the carriageway, but lighting and road markings are provided in Tarbert and Ballylongford. The L1010 facilitates access to a number of residential properties and farms. On approach to Tarbert there is also access to the Tarbert Comprehensive School and the Tullahennel Wind Farm Substation. The L1010 is not a bus route.



Plate 14.2: L1010 Coast Road

N67

The N67 (National Secondary Road) is approximately 6.2m wide and connects Co. Kerry with Co. Clare and Co. Galway via the Tarbert – Killimer ferry across the Shannon Estuary, in a north-west to south-east direction. As shown in Plate 14.1, the N67 allows for connection from Tarbert town to the Site, with the two access points to the Site (southern and northern) located off the N67.

Of the 2.4km stretch of N67 between Tarbert and the Site, approximately 1.5km has pedestrian footways. For the most part these are provided on only one side of the road and are unlit.

Approximately 900m of this stretch of the N67 has no footway provision. The majority of this 900m section is on approach to the Site accesses where advisory walkways are available as shown in Plate 14.3 (space beside the edge of road markings).



Plate 14.3: Advisory Walkways on N67

This route also provides connection to Tarbert Ferry Terminal for a ferry service across the Shannon Estuary.

N69

The N69 (National Secondary Road) connects Tralee in Co. Kerry with Limerick City running in a northerly direction from Tralee to Tarbert and an easterly direction towards Limerick. Within the study area the road is approximately 6m wide and is a bus route. Outside of the towns and villages, within the study area, no footpaths, cycle lanes or lighting columns are present.

14.4.1.2 Traffic Surveys

Traffic surveys were undertaken by an independent survey company (IDASO) under instruction from AECOM. The results from the traffic surveys have been used to inform the baseline conditions on the surrounding road network (refer to EIAR Volume II Appendix 14A).

Classified junction turning counts were undertaken on a neutral weekday (i.e., Monday-Thursday during a time outside of national, local and school holiday periods and also Bank Holiday weeks), Thursday 18 May 2023 between 07:00 and 19:00 hours. The survey recorded data in 15-minute intervals and was fully classified. The junction turning counts were undertaken at the following locations as shown in Figure 14.1, refer to EIAR Volume III.

- Junction 1 - N67/ Tarbert Power Station Northern Site Access – 3-arm priority junction.
- Junction 2 – N67/ Tarbert Power Station Southern Site Access – 3-arm priority junction; and
- Junction 3 – N67/ R551 – 3-arm priority junction.

The junction count data showed an AM peak hour of between 07:15-08:15 hours, and a PM peak hour of between 17:00 and 18:00 hours (Survey data shown in Appendix 14A, EIAR Volume II).

An Automatic Traffic Count (ATC) survey was undertaken on the N67 approximately 900m south of the southern SSE Tarbert Site entrance as shown in Figure 14.1 (refer to EIAR Volume III). The ATC survey was undertaken over seven days 18 May - 24 May 2023, collecting bi-directional hourly volumetric data.

The ATC recorded a seven-day average daily traffic flow of 1221 vehicles on N67 with 9% of vehicles being heavy duty vehicles (HDVs).

It should be noted that at the time of the traffic surveys, construction traffic associated with the development of the Temporary Energy Generation (TEG) on the SSE Tarbert site was on the highway network. However, due to being at the very beginning of the programme, the construction trips were nominal and have little impact on the baseline flows.

To confirm this, daily flows recorded on N69 by TII traffic counter reference TMU N69 045.0 W have been collated and compared for the survey day and the previous four Thursdays when construction of the TEG project had not commenced (Thursdays selected for consistency due to the survey date being on a Thursday). No data was collected before Thursday 20 April 2023 as traffic flows may have been impacted by Easter holidays in the weeks prior to this date. The data collected is shown in Table 14.2.

Table 14.2: TII Counter Data for weeks Prior to the Survey Day

Date	AADT	AM Peak	PM Peak
Thursday 18 May 2023 (survey day)	3560	305 (07:00)	357 (16:00)
Thursday 11 May 2023	3399	337 (07:00)	356 (16:00)
Thursday 04 May 2023	3378	306 (07:00)	336 (16:00)
Thursday 27 April 2023	3539	325 (07:00)	357 (17:00)
Thursday 20 April 2023	3712	293 (07:00)	390 (17:00)

As shown in Table 14.2, the flow recorded on the survey day is similar to that of the weeks prior and is therefore considered to be a typical Thursday flow that has not had significant traffic flows added. The recorded flows have therefore been considered appropriate to use as background flows.

The TEG construction is expected to be in the commissioning and operational phase in Q2 2024 when the Proposed Development construction commences. There is therefore potential for a short overlap in programmes. However, it is reminded that the traffic surveys captured a level of traffic on the network associated with TEG construction. The TEG commissioning traffic generation is expected to be lower than that on the network when traffic surveys were being undertaken. Therefore, this overlap doesn't need to be assessed as a cumulative impact as it would double count trips on the network. i.e., it would assess typical baseline traffic + TEG traffic on the network at the time of surveys + TEG commissioning traffic which are unlikely to be a realistic scenario.

14.4.2 Road Safety

As part of the road network analysis a review of the Road Safety Authority (RSA) traffic collision database was undertaken for the road network in the vicinity of the Proposed Development to identify

any collision trends. The purpose of this review was to identify any potential safety concerns in relation to the existing road network.

Traffic collision data has therefore been collected for the N67/N69 and L1010. The most recent publicly available traffic collision data for this area is available from 2005 – 2016. The incidents are shown in Plate 14.4 and are categorised into severity of minor, serious and fatal.

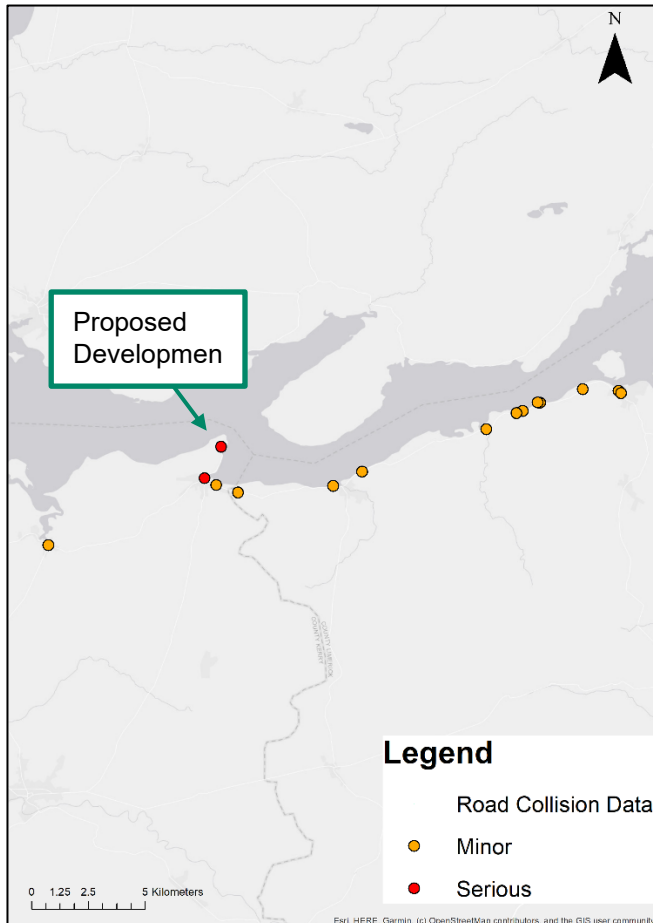


Plate 14.4: Road Collision Data (Source: Road Safety Authority)

The results of the analysis indicated that there have been 13 no. minor and 2 no. serious reported incidents within the local area.

The RSA website has been offline for some period due to GDPR issues, and (at the time of completion of this EIAR, October 2023) it is unclear when the website will be updated and functioning again to provide more up to date Road Collision Data.

14.4.3 Walking Infrastructure

As previously noted in Section 14.4.1.1, a pedestrian footway is provided along the western side of the N67 carriageway which becomes an advisory walkway (depicted by white road lines and not a footpath) approximately 750m from the Tarbert Ferry Terminal.

A short section of pedestrian footway is also provided on the eastern side of N67 on either side of the ferry terminal access. However, no pedestrian footways are available on the western side of N67 in close proximity to the Site accesses.

14.4.4 Cycling Infrastructure

There are no designated cycling facilities provided within the extent of the study area.

14.4.5 Bus/ Ferry Travel

There is a bus stop located on N69 in Tarbert approximately 2km from the Site which is operated by Bus Eireann (Stop number:357671). One service stops at this bus stop, travelling from Ballybunion to Limerick. The service runs four times per day.

There is a ferry crossing from Tarbert to Killimer in Co. Clare located at the Tarbert Ferry Terminal, north of Tarbert and adjacent to the east of the Proposed Development. This ferry crossing takes approximately 20 minutes and runs every hour from 07:00 to 21:30. This service allows people to transport car, coaches, bicycles, motorcycles, and large commercial vehicles from Killimer in Co. Clare to Tarbert in Co. Kerry and vice versa. This crossing reduces the need to drive around the Shannon Estuary (137km route).

14.5 Predicted Impacts

14.5.1 Do Nothing Scenario

The 'do nothing' scenario describes the circumstance where no development occurs. Should the Proposed Development not take place, the surrounding road network will remain in the current condition i.e., the SSE Tarbert Site will continue to generate the same vehicular traffic to the SSE Tarbert Site as it currently generates.

This 'existing' condition includes traffic associated with the construction of the TEG on the SSE Tarbert Site and therefore no additional traffic associated with TEG construction needs to be considered.

However, natural traffic growth is expected to occur. Based on predicted growth rates for the KCC area (TII Project Appraisal Guidelines for National Roads Unit 5.3 – Travel demand Projections, 2017), the background traffic is expected to increase by 1.0337% between 2023 and 2026 and by 1.1970% between 2023 and 2041.

14.5.2 Construction Phase

The construction phase is predicted to take a period of up to 29 months (including mobilisation and commissioning). The traffic assessment has been based on the period within the construction phase generating the peak or maximum amount of vehicular traffic i.e., the worst-case scenario, to provide a robust assessment. The peak traffic generation will be set out in the following sections.

14.5.2.1 Access

Construction traffic will access and egress the Proposed Development Site via the existing SSE Tarbert access and egress points off N67. These access and egress points are shown in Figure 14.2 (refer to EIAR Volume III).

14.5.2.2 Car Parking

Temporary car parking provision during the construction phase has been based on a first principles approach considering the volume of construction personnel. Areas shown in Figure 14.3 (EIAR Volume III) demonstrate the various areas within the Site which will be available for construction staff.

14.5.2.3 Haulage Routes

It is anticipated that most major equipment deliveries will travel to the Proposed Development Site from Foynes Port, which is located approximately 25km east, off the N69. Fuel deliveries and deliveries of other materials are expected to be transported from various locations across Ireland (exact locations to be confirmed once a Contractor is appointed).

As set out in the Construction Traffic Management Plan (CTMP) (refer to Appendix 14B, EIAR Volume II), AECOM have indicated that all construction traffic (HDVs) associated with the Proposed Development (heavy haul, general deliveries, and site operatives) will arrive via the N69 and the N67 and other National/ Regional Roads.

All abnormal loads associated with the Proposed Development will be delivered via the same routes. KCC and other affected local authorities will be informed of and approve any abnormal load movement (longest components up to 20m in length) before they take place as these may require road closures or other temporary measures. An abnormal loads report will be undertaken by the contractor to assess the suitability of each abnormal load route and the proposed timing of travel.

The appointed Contractor will be required to provide detail of any HDV routing in the full CTMP. As previously noted, these routes will follow National and Regional roads where possible. This will consider deliveries from any other locations.

14.5.2.4 Staff Distribution

It is considered that staff will likely travel from a range of locations. However, they will be encouraged to car share and travel along the National and Regional roads where possible to avoid impact on smaller local roads. As the study area being assessed does not extend further than R551/N67 T-junction, no further distribution is required at this stage.

It is reminded that the study area covers this junction due to being where the highest traffic impact is expected.

14.5.2.5 Construction Works Programme

An outline programme of works is presented below and will be finalised by the appointed Contractor. The construction phase of the Proposed Development will be up to 29 months (including mobilisation and commissioning). **Error! Reference source not found.** 14.3 provides the development phases planned during the construction process.

Table 14.3: Development Phases

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
Activities	Mobilisation and Site Prep																													
			Demolition Works																											
							Construction Works																							
																										Fuelling and Commissioning				

14.5.2.6 Construction Traffic Management Plan (CTMP)

A CTMP has been prepared as part of this planning application, refer to Appendix 14B, EIAR Volume II.

Prior to commencement of construction works the appointed Contractor will draw up detailed Method Statements which will be adhered to by this Construction Methodology, environmental protection measures included within the planning application, measures proposed within the CTMP, and the guidance documents and best practice measures to be implemented in full during the construction phase.

14.5.2.7 Construction Hours

The working hours that construction will take place on the Proposed Development Site consist of:

- Monday to Friday 07:00 to 19:00; and
- Saturdays 08:00 to 15:00.

No works shall take place on Sundays or Bank Holidays.

Construction work outside these hours will only take place in exceptional circumstances (i.e., for specific engineering works e.g., concrete pours etc.), and this will be agreed in advance with KCC. Specific engineering works may entail 24 hours working, for limited durations. In this case, KCC may permit works to proceed outside the above times / days.

Some abnormal loads may be delivered at off peak times due to the nature of the load and the space the load takes on the road network. In these exceptional cases, KCC may permit works to proceed outside the above times / days. This will be subject to agreement with KCC, prior to such works commencing. Work conducted outside of core hours, will comply with any restrictions agreed with the planning authorities, regarding the control of noise and traffic.

The majority of construction staff will arrive before 07:00 each working day (weekday) and before 08:00 on Saturdays. Due to the nature of the work and the various shifts that staff will be scheduled for, the departure times will vary on the length of shift that the personnel undertake on any given day. It is understood that most staff will undertake a 12-hour shift (departing at 19:00) and a small proportion will complete an 8-hour shift, departing from the Site at approximately 15:00. Staff on Saturday will undertake a 7-hour shift. The exact scheduling and staff shift numbers will be confirmed by the appointed Contractor.

During months 25-29 of the construction phase, there will be scheduled testing and commissioning of the Proposed Development. The Proposed Development will be required to run in an operational state during this period. It is understood that this may require the plant to operate on a 24-hour schedule including the need for overnight staff.

14.5.2.8 Traffic Generation - Construction Phase

Table 14.4 sets out the light duty vehicles (LDV) and HDV trip generations for each month of the construction period.

Table 14.4: Daily Traffic Generation Estimated at the Site (Arrivals)

Month	Personnel / Day	Staff LDV Arrivals	Other LDV Arrivals	HDV/ Arrivals	Total Arrivals	Total Two-Way Trips
1	5	3	0	0	3	6
2	10	7	0	0	7	14
3	30	20	2	4	26	52
4	30	20	3	4	27	54
5	30	20	3	4	27	54
6	50	33	3	4	40	80
7	50	33	3	8	44	88
8	50	33	3	8	44	88
9	100	67	5	8	80	160
10	100	67	5	8	80	160
11	150	100	5	8	113	226
12	200	133	6	15	154	308
13	200	133	6	15	154	308
14	200	133	6	15	154	308
15	200	133	6	15	154	308
16	200	133	6	15	154	308
17	200	133	6	15	154	308
18	200	133	6	15	154	308
19	200	133	6	15	154	308
20	200	133	6	15	154	308
21	200	133	6	15	154	308
22	200	133	6	15	154	308
23	150	100	6	15	121	242
24	150	100	3	15	118	236
25	100	67	2	8	77	154
26	100	67	2	4	73	146
27	100	67	1	4	72	144
28	50	33	1	22	56	112
29	20	13	1	22	36	72

As detailed in Table 14.4, the employment levels will vary throughout the construction phase of the Proposed Development. Months 12 to 22 will observe the highest number of staff vehicle arrivals on the Site with a maximum of 200 staff on Site at once.

Based on observations at other similar construction sites, there is a common car occupancy of two staff. For this development a car occupancy of 1.5 has been used to account for some site management movements which will require individual travel. When applying this to the peak employment period, it is calculated that there will be 133 staff vehicles (LDVs) arriving to the Site each day during the peak months (266 LDV two-way trips).

Other LDVs will also arrive to the site with peak arrivals also during the same Months 12 to 22. Therefore, during these months a total of 139 LDVs will arrive to the site (278 two-way trips – staff and other LDVS).

HDV movements are expected to peak in Months 28 -29 with a total of 22 HDV arrivals each day (44 two-way trips).

However, to allow for a worst-case assessment, the peak LDV trips during Months 12-22 (278 two-way trips) will be assessed alongside the peak HDV trips from Months 28-29 (44 two-way trips).

Staff vehicles and other LDVs/HDVs are not expected to arrive at the same time each day. It is forecast that construction phase HDVs will arrive in a relatively uniform pattern throughout the day e.g., 22 movements over 12-hours produces a maximum of two HDV arrivals per hour to the Site. The same applies to 'other' LDV movements, resulting in a maximum of one 'other' LDV arrival per hour. This results in a two-way flow of four HDVs and two LDVs per hour throughout normal 07:00 to 19:00 construction weekday working hours. Staff trips are expected to arrive and depart based on normal start / finish times i.e., before 07:00 and after 19:00.

14.5.2.8.1 Percentage Impacts of Peak Construction Traffic

The percentage impact of the predicted peak construction traffic on the local junctions is shown in Table 14.5. The peak construction phase traffic is predicted to be in 2025/ 2026. The impact calculations are based on 2026 background traffic flows as there is expected to be more traffic on the network during this time (2023 flows increased to forecast 2026 flows).

Table 14.5: Percentage Impact during the Construction Phase of Development

Location	2023 Surveyed Traffic (07:15-08:15 and17:00 - 18:00)			2026 Forecast Background Traffic			Development Generated Traffic			2026 Forecast Background Traffic + Development Traffic	% Increase in Traffic	
				Growth factor1.033671								
	All Vehicles	LDVs	HDVs	All Vehicles	LDVs	HDVs	All Vehicles	LDVs	HDVs	All Vehicles	All Vehicles	
JTC 1	Am Peak	27	20	7	28	21	7	6	2	4	34	21%
	Pm Peak	23	22	1	24	23	1	6	2	4	30	25%
JTC 2	Am Peak	94	76	18	97	79	19	6	2	4	103	6%
	Pm Peak	27	26	1	28	27	1	6	2	4	34	21%
JTC 3	Am Peak	75	62	13	78	64	13	6	2	4	84	8%
	Pm Peak	111	100	11	115	103	11	6	2	4	121	5%

As shown in Table 14.5, the percentage impact at each junction during peak periods ranges from 5%-25%. This exceeds the TII 10% impact threshold on the Site access points. However, the combined traffic flow of background traffic + development traffic is very low and therefore the junctions will operate well within capacity. The impact of the Proposed Development construction traffic on the network is therefore considered to have slight effects that are temporary in nature.

To ensure this is correct, a daily road capacity assessment has been completed. This assessment considers the total maximum daily flow on both N67 and N69 and assumes all traffic travels on both links. This predicted traffic is set out in Table 14.6.

Table 14.6: AADT Road Capacity Assessment

Link	2023 AADT	2026 AADT	Total Development Flow	Total Traffic Flow (Existing and Proposed)
N67	1221	1262	308	1570
N69	3560	3680	308	3988

Based on guidance in 'NRA TD 9/07 Road Link Design' the AADT road capacity for both N67 and N69 is 8600 vehicles. The total proposed traffic flow is therefore comfortably within the maximum capacity of the roads.

Both links are part of the National Road Network for Ireland and are therefore designed to withstand large volumes of traffic including HDVs. The additional HDV movements on these links are therefore expected to also result in a negligible impact.

14.5.3 Operational Phase

The operational phase has been scoped out of the assessment as minimal operational traffic will be generated. A brief explanation of traffic generation is provided in the following section but not assessed.

14.5.3.1 Traffic Generation - Operational Phase

During the operational phase, the Proposed Development will run on Hydrotreated Vegetable Oil (HVO). The HVO will, as part of the Proposed Development, be delivered to Site by road in HDV tankers.

Therefore, deliveries of HVO will be by road and will be stored on Site in proposed tanks before being pumped to its operating destination within the Site. During standard operation there will only be 13no. staff arriving to the Site each day.

There will be a backup supply of HVO on-site. During times of emergency grid demand when the proposed OCGT is required to be operational, the Proposed Development will generate up to 18 HDV arrivals per day for HVO and other materials and up to 20 LDV arrivals per day for workers. This is unlikely to have a significant impact on the surrounding road network.

HVO fuel delivery by road will be limited to the hours of between 07:00 and 19:00, Monday to Saturday, and no deliveries will take place on Sundays or at night, except in the case of extended emergency operations.

In situations where outages take place, no more than 30-40 staff will be required on Site. Based on a car occupancy of 1.5, this will result in no more than 27 LDV arrivals each day. These works will generally take place during the summer months.

14.5.3.2 Car Parking

Parking is proposed to be provided within the Site boundary once operational. As there is no parking requirement guidance within the KCC Development Plan for this land use, the parking provision has been based on first principles i.e., predicted staff numbers.

14.5.4 Decommissioning

It is expected that the Proposed Development will be operational for 25 years from the date of commissioning. At the end of the operational phase, the Proposed Development will either be decommissioned, or the operational lifetime will be extended. Decommissioning or extension of the operational lifetime of the Proposed Development will therefore be expected to commence at some point after 2051.

At the end of the operational phase, all above-ground infrastructure associated with the Proposed Development will be decommissioned and removed from the Site. However, prior to the removal of infrastructure, all residues and operating chemicals will be cleaned out from the plant and disposed of at a suitably licenced facility.

A Decommissioning Plan (which will include a Decommissioning Environmental Management Plan (DEMP)) will be prepared and agreed with the EPA as part of the permit surrender process. The DEMP will consider the potential environmental risks at the Site and provide guidance and appropriate mitigation procedures as necessary, to minimise risk.

During the decommissioning phase there will be the need for a Site office and staff facilities, which will be located on-site. The DEMP will include an outline programme of works and ensure that decommissioning phase activities will be conducted in accordance with the appropriate guidance and legislation. It is expected that decommissioning will take up to one year.

Effects arising from the process of decommissioning of the Proposed Development are therefore considered to be of a similar nature and duration to those arising from the construction phase and have not been considered separately in this chapter. Where this assessment refers to potential construction effects of the Proposed Development, these are also representative of predicted decommissioning effects.

14.6 Mitigation Measures

A CTMP has been prepared as part of this planning application, refer to EIAR Volume II Appendix 14B. The detailed CTMP will be updated to incorporate planning conditions by the appointed Contractor in consultation with KCC. The detailed CTMP will be updated to include the following.

- The agreed route for construction traffic including any Abnormal Indivisible Loads (AIL).
- Warning signs / advanced warning signs will be installed at appropriate locations in advance of the construction access locations. For example, warnings advise other road users of times of slow-moving vehicles during abnormal load deliveries.

- Details of the advanced notification to the general public warning of any construction transport movements, specifically abnormal loads.
- The necessary agreements and timing restrictions for construction traffic, for example Monday-Saturday working only.
- Consideration will be given to reduce the volume of construction traffic accessing the Site through reduce – reuse and recycle methods. Delivery control will also be adopted to reduce potential heavy vehicle convoys.
- Material deliveries and collections from Site will be planned, scheduled, and staggered to avoid unnecessary build-up of demolition / construction works related traffic.
- HDV trips will be required to arrive and depart the Site at a uniform rate throughout the day to avoid pressure on the morning and evening peak hour periods.
- Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on trucks carrying dust producing material.
- Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds within the Site.
- Parking of Site vehicles will be managed and will not be permitted on the public road, unless proposed within a designated area that is subject to traffic management measures and agreed with KCC.
- A road sweeper will be employed to clean the public roads adjacent to the Site of any residual debris that may be deposited on the public roads leading away from the construction works.
- All vehicles will be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol or diesel. Spill kits will be available on Site. All scheduled maintenance carried out off-site will not be carried out on the public highway.
- Proposals for maintenance of the agreed routes for the duration of the construction phase.
- Proposals for monitoring routes
- The mechanism for managing and monitoring the CTMP manage all aspects of the plan.
- Route signage. Temporary signage designating permissible HDV routes.
- Maintaining access to commercial / business premises. For example, temporary accommodation works and additional information signage.
- Preparation of a Travel Plan for staff.
- Arrangements for regular road cleaning, e.g., road sweeping in the vicinity of the Site access point as necessary, wheel cleaning / dirt control arrangements.

- On Site wheel washing will be undertaken for construction trucks and vehicles to remove any debris prior to leaving the Site, to remove any potential debris on the local road.
- Contractor speed limits.
- Community and emergency services liaison details.
- Using Garda escorts for abnormal loads where required.

In addition to the preparation of a CTMP, other mitigation measures to reduce the traffic impact of the construction phase of the Proposed Development would also be considered subject to further investigation. For example, any mitigation measures noted in conditions will be included in the final CTMP.

14.7 Residual Impacts

The temporary increase in construction traffic is likely to result in a slight environmental effect in terms of temporary construction phase traffic. The management of these effects will be achieved through the implementation of the detailed CTMP.

- Once the identified mitigation and monitoring measures, appropriate design standards and operational management plans are adhered to, it is considered that any impacts from the Proposed Development will result in a Temporary Negative effect, Slight in significance, during the construction phase.

Table 14.7: Residual Impacts

Mode	Impact	Effect Significance	Mitigation	Residual Effect Significance	Quality of Effects	Duration of Effect
Construction Traffic						
Traffic	Increased construction traffic flows on the road network resulting in an increase in local traffic volumes.	Slight	The CTMP prepared as part of this application will be implemented in full by the Contractor and will be updated by the Contractor, where necessary, to comply with any planning conditions and in agreement with KCC.	Not Significant	Negative	Temporary

14.8 Cumulative Impacts

A search of planning applications within 5km of the Site is presented in Chapter 4 of the EIAR (Table 4.2). A summary of each development and the potential to increase traffic volumes either during construction or operation and date of granting are presented in Table 14.8.

Table 14.8: Development Considered for Cumulative Impacts

Ref. No.	Location	Grant / Due Date	Decision	Description	Traffic and Transport Context
23350	Tarbert 220kv substation, Tarbert Generating Station, Tarbert Island, (Townland)	24.05. 2023	Further Information	The proposed development will comprise of the following on a site measuring approximately 6.9 hectares: (1) Removal of existing cable joint, bay within Tarbert generating station, 220kv switchgear within the existing Tarbert substation compound and associated 220kv cabling; (2) two no. lengths of 220kv underground cabling measuring approximately 340m each, running between two no. new underground cable joint base in Tarbert generating station and the connection point at Tarbert Substation; (3). The new 220kv switchgear bay within the existing Tarbert substation compound comprising associated electrical equipment, including cable sealing ends, insulators, overhead conductors, surge arrestors, lighting masts and lighting poles; and (4) All ancillary site development works including temporary construction compound and layout areas, site preparation works, and ground levelling as required to facilitate the works. Tarbert generating station is licensed by the environment protection agency (EPA) under the industrial emissions (i.e.) license (Ref: P0607-02). The proposed development includes works located within the license boundary of Tarbert Generating station which is an upper tier establishment to which chemicals act (control of major accidents hazards involving dangerous substances) Regulation 2015 (The COMAH regulations) apply. This planning is accompanied by a Natura Impact Statement (NIS).	This application is still in the planning process. If it were to be granted planning, it would likely result in an increase in the traffic flow along the N69 and N67. Based on the 'Planning Environmental Considerations Report' submitted for the development, there would be a maximum of 147 traffic movements each day associated with construction. This traffic will therefore be assessed alongside the Proposed Development peak daily traffic later in this section.
20438	Meelcon Carhoona Farranawana Tarbert Doonard Upper and Lower Kilpadoge Ballyline west Ballymacasy Lislaughtin Glamculla re South Gureteea	21.06. 2021	Conditional	Amend a previously granted permission (Kerry County council planning ref 19/381) (An bord Pleanála ref ABP -304807-19) which relates to a change in the grid connection route for the permitted wind farm. the revised route will entail the construction of approximately 12.1km of 38kv underground electric cable connecting the existing permitted windfarm (19/381) to the 38kva/110kva substation at Kilpadoge, Tarbert. The underground cables will be located along the public roads R551, R552 and L1010 and along 2 sections of private property. The cable will be installed in excavated trenches approximately 1.2km in depth and will include associated underground ducting joint bays, communication chamber bays,	This was consented in 2021, Due to the nature of this type of project is not anticipated to generate significant operational traffic.

Ref. No.	Location	Grant / Due Date	Decision	Description	Traffic and Transport Context
	vallig, Co. Kerry.			drill pits, sheath link boxes and inspection chamber, associated equipment and all ancillary site and ground works. The development will also consist of the connection of the permitted windfarm (19/381), via existing permitted underground electricity cables, to the proposed cable. the underground cable will be located in the townlands of Ballyline west, Ballymacasy, Lislaughtin, Glancullare south, Gurteenavallig, Meelcon Carhoona, Farranawana, Doonard Upper, Doonard Lower Tarbert and Kilpadoge 'The applicant is seeking a ten-year planning permission and operational period of 25 years. An appropriate assessment screening report and an environmental impact assessment screening report has been prepared and submitted as part of this application. A NIS has been submitted with this application.	
19115	Kilpaddo ge, Tarbert, Co. Kerry	07.02 .2020	Granted	For a 10-year permission for a grid stabilisation facility comprising of the construction up to 4 no. rotating stabilisers, 5 no. battery storage containers, 1 no. control room, 2 transformers and ancillary equipment within a site area of approximately 1.46 hectares.	This was consented in 2020. Due to the nature of this type of project, it is not anticipated to generate significant construction or operational traffic.
21549	Kilpaddo ge, Tarbert, Co. Kerry	19.07. 2021	Conditional	(a) A high inertia synchronous compensator (HISC) compound containing 1 no. HISC unit enclosed within a steel clad framed style structure (12.1m max height) and supported by 8 no. electrical equipment containers (containing ancillary power supply products including a static frequency converts, mv switchgear, exciters, lv distribution, control room, welfare and office), main auxiliary and start-up electrical transformers, generator circuit breaker, switchgear equipment, external cooler units and 1 no. back up diesel generator and associated diesel storage tank; (b) A 220kv high voltage gas insulated switchgear (GIS) substation compound containing a GIS substation building with all control and hv equipment within a single storey building (13.2m max height). The building will be surrounded by a compound road and contained within a 2.6m high galvanised steel palisade fence; (c) A battery storage compound containing 5 no. battery storage containers, enclosed in steel containers of dimensions approximately 13m by 2.5m by 3m, housing individual battery components with 2 no fitted external HVAC systems for each unit and supported by 13 no. inverter stations, 14 no. auxiliary transformers and control container; (d) 220kv underground cable to the existing adjoining EirGrid substation; (e) Associated elements comprising various underground cables and ducts, equipment plinths, boundary security	This was consented in 2021. Due to the nature of this type of project, it is not anticipated to generate significant construction or operational traffic.

Ref. No.	Location	Grant / Due Date	Decision	Description	Traffic and Transport Context

fence, compound lighting and palisade gates and fencing, security lighting, CCTV, internal access roads, hardstanding areas and all necessary foundations works for the above compounds. the planning application is on lands where grid stabilisation facility was previously permitted under planning register no 19/115. Planning permission to construct the development is sought for a period of 10 years. a natura impact statement (NIS) has been prepared in respect of the proposed development and accompanies the application

14.8.1 Cumulative Assessment

As noted in Table 14.8, application 23350, if approved, could potentially have an overlapping construction period with the Proposed Development. Table 14.9 sets out the daily traffic flow during the overlap of these developments to ensure the road network has capacity for all vehicles movements at the same time. This assumes a worst case of all proposed 147 trips associated with application 23350 travelling on both N67 and N69.

Table 14.9: Cumulative Assessment

Link	2026 Baseline + Proposed Development Traffic	2026 Baseline + Proposed Traffic + Cumulative Traffic
N67	1570	1717
N69	3988	4135

As shown in Table 14.9, the two-way flow on each link remains below the daily 8600 vehicle threshold that the roads are designed for (See Section 14.5.2.8.1 for capacity details). It is therefore considered that this overlap in trips is not expected to result in a significant impact and that the roads will have capacity to deal with the additional traffic.

The contractors of each development will be required to communicate to co-ordinate movements efficiently. This will be addressed within the detailed CTMP.

14.9 Summary

The Proposed Development will utilise the existing National Road network, i.e., N67 and N69 for construction phase traffic. The implementation of an approved CTMP prior to construction will minimise the potential for traffic and transport impacts during construction activities and the residual impact will be **Not Significant** and **Temporary**.

During the operational phase, the traffic generation will be minimal. The operational phase assessment was therefore scoped out as it will not generate a significant traffic impact. The same conclusion is

reached for the decommissioning phase of the development when less traffic will be generated than assessed for the construction phase.

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SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 15 Population and Human Health

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November 2023

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Table of Contents

15.	Population and Human Health	15-1
15.1	Introduction	15-1
15.2	Legislation, Policy, and Guidance	15-1
15.3	Methodology	15-10
15.4	Baseline Environment	15-16
15.5	Potential Impacts	15-26
15.6	Mitigation Measures	15-34
15.7	Cumulative Impacts	15-34
15.8	Do Nothing Scenario	15-35
15.9	Residual Impacts and Summary	15-35
15.10	References	15-37

Plates

Plate 15.1:	Social Determinants of Health	15-15
Plate 15.2:	Age Breakdown	15-18
Plate 15.3:	Deprivation Index	15-19
Plate 15.4:	Means of travel to work, school or college (population aged 5+ years)	15-25
Plate 15.5:	Estimated Number of Construction Workers Required On-Site	15-28

Tables

Table 15.1:	Examples of Sensitivities Assigned to Different Land Uses	15-11
Table 15.2:	Criteria Used to Assess Magnitude of Effect of Severance	15-13
Table 15.3:	Classifications of the Significance of Effects	15-14
Table 15.4:	Human Health Impact Categories	15-16
Table 15.5:	Highest Level of Education Completed	15-20
Table 15.6:	Principal Economic Status (aged 15+ years)	15-20
Table 15.7:	Social Class	15-21
Table 15.8:	Live Register	15-21
Table 15.9:	Land Use	15-22
Table 15.10:	Site Operational Timeline	15-22
Table 15.11:	Population by General Health	15-23
Table 15.12:	Mental Health Indicators	15-23
Table 15.13:	Duration of Travel to Work, School, or College (population aged 5+ years)	15-24
Table 15.14:	Net Construction Employment	15-29
Table 15.15:	Summary of Potential Effects on Population Receptors	15-36
Table 15.16:	Summary of Potential Effects on Human Health Receptors	15-36

15. Population and Human Health

15.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) describes the potential effects of the Proposed Development on population and human health.

This chapter defines the study area, the methodology used for developing the baseline and impact assessment, provides a description of the baseline environment in relation to population and human health, and presents the findings of the impact assessment.

Impacts on population and human health have potential to arise from various aspects of the Proposed Development. The following chapter provides an assessment of impacts on:

- Land use.
- Access and severance between local residents and community resources.
- Economic activity and employment.
- Human health and wellbeing.

Many of the potential population and human health effects of the Proposed Development arise from air quality, noise and vibration, visual and traffic effects. Therefore, the human health impact assessment (HIA) relies on the assessments and draws on the findings of the following chapters as necessary to assess the impacts on human health: Chapter 7 (Air Quality), Chapter 10 (Landscape and Visual), Chapter 11 (Noise and Vibration), Chapter 14 (Traffic and Transport) and Chapter 17 (Climate).

This is consistent with the EPA EIAR Guidelines (2022) *'the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in this EIAR e.g., under the environmental factors of air, water, soil etc.'*

Full details on the background and Site history are provided in Chapter 4 (Existing Site), and details of the Proposed Development are provided in Chapter 5 (Description of the Proposed Development) and the Planning Statement submitted with this planning application.

15.2 Legislation, Policy, and Guidance

This section will provide an overview of the relevant legislation, planning policy, and technical guidance relevant to the assessment. This chapter has been prepared in accordance with the following:

- Environmental Protection Agency (EPA) (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- European Commission (EC) (2017). Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report.
- Highways England (2020). Design Manual for Roads and Bridges: Population and Human Health.

- Institute of Public Health (2021). Health Impact Assessment Guidance: A Manual.
- Institute of Environmental Management and Assessment (IEMA) (2017). Health in Environmental Impact Assessment 2017.
- IEMA (2022). Determining Significance for Human Health in Environmental Impact Assessment.
- International Association for Impact Assessment (IAIA) (2019). Addressing Human Health in Environmental Impact Assessment As per EU Directive 2011/92/EU amended by 2014/52/EU CONSULTATION DRAFT November 2019.
- European Public Health Association (EUPHA) (2019). Addressing Human Health in Environmental Impact Assessment.
- National Health Service (NHS) (2019). Healthy Urban Development Unit (HUDU) guidance (Fourth Edition).

15.2.1 National Policy

National Planning Framework: Project Ireland 2040

The *National Planning Framework (NPF) - Project Ireland 2040*¹ is the Government's high-level strategic plan for shaping the future growth and development of Ireland to the year 2040. It is a framework to guide public and private investment, to create and promote opportunities for the people of Ireland, and to protect and enhance the environment.

Chapter 6: People, Homes and Communities of the *National Planning Framework: Project Ireland 2040* sets out the following themes of relevance to Population and Human Health:

- Quality of Life and Place.
- Healthy Communities.
- Diverse and Inclusive Ireland.
- Age Friendly Communities.
- Childcare, Education and Lifelong Learning; and
- Housing.

Within Section 6.2: 'Healthy Communities', it is noted how specific health risks, such as heart disease, respiratory disease, mental health, obesity, and other injuries, can be influenced by spatial planning. It is also suggested that by taking a whole-system approach to addressing the many factors that impact on health and wellbeing and which contribute to health inequalities, and by empowering and enabling individuals and communities to make healthier choices, it will be possible to improve health outcomes, particularly for the next generation of citizens.

The following objectives are of relevance to this population and human health assessment:

¹ GOI (2018). *National Planning Framework: Project Ireland 2040*.

- **National Policy Objective 26:** “Support the objectives of public health policy including Healthy Ireland and the National Physical Activity Plan, through integrating such policies, where appropriate and at the applicable scale, with planning policy”.

Healthy Ireland Framework 2019-2025

The Healthy Ireland Framework² sets out a vision to create “a Healthy Ireland, where everyone can enjoy physical and mental health and wellbeing to their full potential, where wellbeing is valued and supported at every level of society and is everyone’s responsibility”.

The Healthy Ireland Framework is designed to bring about real, measurable change and is based on an understanding of the determinants of health. Health and wellbeing are affected by all aspects of a person’s life: economic status, education, housing, the physical environment in which people live, and work.

The Healthy Ireland Framework was first launched in 2013 and presents four central goals for improved health and well-being:

- Increase the proportion of people who are healthy at all stages of life.
- Reduce health inequalities.
- Protect the public from threats to health and well-being; and
- Create an environment where every individual and sector of society can play their part in achieving a healthy Ireland.

The Healthy Ireland Framework states that:

“the area of environment and health, in its broadest sense, comprises those aspects of human health, disease, and injury that are determined or influenced by factors in the environment. This includes not only the study of the direct pathological effects of various chemical, physical, and biological agents, but also the effects on health of the broad physical and social environment, which includes housing, urban development, land use and transportation, industry, and agriculture”.

As such, the Healthy Ireland Framework reaffirms the need for the Proposed Development to be considered in respect of its impacts on health.

15.2.2 Local Planning Policy

The Proposed Development is located in Co. Kerry; however, a review of neighbouring county’s development plans (Limerick and Clare) was undertaken due to the proximity of Tarbert to its neighbouring counties (within 5km) and in order to identify any potential constraints, none were identified.

Kerry County Development Plan 2022-2028

The Kerry County Development Plan 2022-2028 (Kerry CDP) sets out policies and objectives to provide for the proper planning and sustainable development of Co. Kerry. Policies and objectives cover a

² Department of Health (2019). *Healthy Ireland Framework 2019-2025*.

number of subjects such as air, noise, and light pollution, but also economic development and future growth. The Kerry CDP also identifies 205 workers in Tarbert but only 190 jobs, and, in line with the 'Shannon Integrated Framework Plan' (SIFP) (2013), recognises the Tarbert-Ballylongford Landbank for its potential as an Energy Hub and industrial development with associated employment creation opportunities, within which the Proposed Development is situated. Relevant policies set out by the Kerry CDP include:

- Planning for the Future Growth and Development of Rural Areas:
 - **KCDP 5-1:** *Facilitate the development of the rural economy by supporting a sustainable and economically efficient agricultural and food sector, together with forestry, fishing and aquaculture, energy and extractive industries, the bio-economy and diversification into alternative on-farm and off-farm activities, harnessing technology and opportunities for remote working, while at the same time noting the importance of maintaining and protecting the natural landscape and built heritage which are vital to rural tourism.*
- Healthy Communities:
 - **KCDP 6-11:** *Support the objectives of public health policy including Healthy Ireland / Kerry and the National Physical Activity Plan.*
- Sustainable Economic Development and Climate Action:
 - **KCDP 9-1:** *Ensure that a sustainable approach is taken to enterprise development and employment creation across all sectors of the Kerry economy.*
- Strategic Economic Objectives:
 - **KCDP 9-4:** *Facilitate and support Co. Kerry's economic recovery through the sustainable implementation of Co. Kerry's COVID-19 Economic Recovery Plan and the emerging Kerry Local Economic and Community Plan, focusing on a transition to a low carbon and digital economy [assisted by the encouragement of Smart Villages] and through sustainably expanding the county's economic sectors, increasing innovation and research, supporting entrepreneurship, the creation of new and expansion of existing businesses, product exports, access to new markets and the development of intellectual property in conjunction with the higher education sector and research centres.*
 - **KCDP 9-11:** *Encourage employment growth in rural towns to support the population of these towns and their wider rural catchments.*
- Shannon Estuary:
 - **KCDP 9-23:** *Support and promote the delivery of the Strategic Development Locations (SDLs) as set out in the SIFP for the Shannon Estuary subject to the implementation of mitigation measures outlined in the Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA) undertaken on SIFP and zoned in the Local Authority Development Plans.*

- **KCDP 9-25:** *Promote and facilitate the sustainable development of the Tarbert-Ballylongford landbank for industry, utilising the presence of deep water, existing infrastructure, natural resources, and waterside location to harness the potential of this Strategic Location. Proposals for marine related industry, general industrial development, and particularly those industries creating a synergism with existing uses and contributing to the development of a strategic energy hub at this location will also be encouraged.*
- **KCDP 9-26:** *Safeguard the role and function of the Power Plant Hub at Tarbert, including the National Oil Reserves Agency (NORA) Strategic Oil Reserves Plant, as a key driver of economic growth in the Region, encouraging its sustainable growth and diversification, in accordance with Regional and National Energy Objectives.*
- Air and Noise Pollution:
 - **KCDP 11-31:** *Improve and maintain good air quality and support measures to prevent harmful effects on human health and the environment in our urban and rural areas.*
 - **KCDP 11-36:** *Ensure that any application with the potential to create noise nuisance is appropriately assessed and that suitable measures to mitigate any nuisance are proposed and implemented.*
- Light Pollution:
 - **KCDP 11-42:** *Require proposals for development that include the provision of external lighting, to clearly demonstrate that the lighting scheme is the minimum needed for security and working purposes and also to ensure that external lighting and lighting schemes are designed so that the incidence of light spillage is minimised ensuring that the amenities of adjoining properties, wildlife and the surrounding environment are protected.*
- Landscape Sensitivity:
 - **KCDP 11-77:** *Protect the landscapes of the County as a major economic asset and an invaluable amenity which contributes to the quality of people's lives.*

Limerick Development Plan 2022–2028

The Limerick Development Plan (Limerick DP) 2022–2028 sets out policies and objectives to provide for the proper planning and sustainable development of Co. Limerick; relevant policies and objectives include:

- Settlement Strategy:
 - **Policy CS P7:** *It is a policy of the Council to: (c) Seek to promote the creation of sustainable places and healthy communities, while ensuring that development occurs at an appropriate pace and that infrastructure is delivered in tandem to support this growth.*
- Spatial Strategy:
 - **Objective CGR O11 – Level 2: Key Town Newcastle West:** *It is an objective of the Council to: b) Support and promote the role of Newcastle West as a strategically located*

urban centre of significant influence in a sub-regional context. In particular, it is an objective to promote the opportunity for inter- regional collaborations across county boundaries with Abbeyfeale, Listowel and Rathkeale and locations identified in the Strategic Integrated Framework Plan for the Shannon Estuary, which offer collective strengths and potential for project partnerships to drive sustainable economic growth in the West Limerick/ North Kerry area.

- Shannon Estuary
 - **Objective ECON O56 – Strategic Integrated Framework Plan:** *It is an objective of the Council to support and facilitate the Strategic Integrated Framework Plan for the Shannon Estuary.*
- Economy and Employment:
 - **Policy ECON P1 – Strong Economy:** *It is a policy of the Council to support the review and implementation of Limerick 2030 – An Economic and Spatial Plan to guide the economic, social and physical renaissance of Limerick City Centre and the wider County / Mid-West Region.*
 - **Policy ECON P6 – Enterprise and Employment Development Opportunities:** *It is a policy of the Council to promote and facilitate opportunities for sectoral development in Limerick, to increase productivity, create employment and to diversify the economy and ensure future economic resilience.*
- Air Quality:
 - **Policy EH P6 – Water and Air Quality:** *It is a policy of the Council to ensure that water and air quality shall be of the highest standard, to ensure the long term economic, social and environmental well-being of Limerick's resources. The World Health Organisation Air Quality Guidelines will be the basis for the air quality guidance in Limerick.*
 - **Objective EH O27 – Improvement of Air Quality:** *It is an objective of the Council to improve air quality and help prevent people being exposed to unacceptable levels of pollution in Limerick, through the support of sustainable modes of transport, renewable energy, promotion of energy efficient buildings and homes and urban greening.*
 - **Objective EH O29 – Air Quality during Construction:** *It is an objective of the Council to protect environmental quality and implement site appropriate mitigation measures during construction and demolition phases of a development, with respect to air quality, including dust.*
- Noise Pollution:
 - **Policy EH P7 – Environmental Noise:** *It is a policy of the Council to proactively manage environmental noise, where it may have a significant adverse impact on the health and quality of life of communities in Limerick and to support the aims of the Environmental Noise Regulations, through the development and implementation of Noise Action Plans.*

- **Objective EH O21 – Noise and Vibration during Construction and at Open Sites:** *It is an objective of the Council to protect the quality of the environment against the effects of noise and vibration, by implementing site appropriate mitigation measures during the construction and demolition phases of development.*
- **Objective EH O22 – Commercial and Industrial Noise:** *It is an objective of the Council to prevent members of the public being significantly adversely affected by environmental noise from commercial and industrial noise activities.*
- Light Pollution:
 - **Objective EH O24 – Light Pollution:** *It is an objective of the Council to ensure that the design of external lighting schemes minimise the incidence of light spillage or pollution in the immediate surrounding environment. In this regard, developers shall submit lighting elements as part of any design, with an emphasis on ensuring that any lighting is carefully directed, not excessive for its purpose and avoids light spill outside the development and where necessary will be wildlife friendly in design.*

Clare County Development Plan 2023–2029

The Clare County Development Plan (Clare CDP) 2023–2029 sets out objectives for the different policy areas addressed by the Clare CDP; development plan objectives relevant to the Proposed Development include:

- Shannon Estuary
 - **Development Plan Objective CDP6.10:** *It is an objective of Clare County Council: a) To proactively implement the Strategic Integrated Framework Plan for the Shannon Estuary including the mitigation measures identified in Volume 9 of this Plan; and b) To support the promotion, marketing and seeking of financial and expertise support for the Strategic Integrated Framework Plan for the Shannon Estuary and specific projects emerging there from.*
- Noise Pollution:
 - **Development Plan Objective CDP11.40:** *It is an objective of Clare County Council: a) To promote the pro-active management of noise where it is likely to have significant adverse impacts on health and the environment.*
- Air Quality:
 - **Development Plan Objective CDP11.41:** *It is an objective of Clare County Council: a) To achieve and maintain good air quality and help prevent harmful effects on human health and the environment in our urban and rural areas.*
- Integrated Development of the Shannon Estuary:
 - **Development Plan Objective CDP12.2:** *It is an objective of the Clare County Council: (a) To co-operate with the relevant agencies to facilitate, encourage and promote development and economic growth and employment in environmentally sustainable*

areas along the Shannon Estuary, by implementing the Strategic Integrated Framework Plan (SIFP) for the Shannon Estuary.

Listowel Municipal District Local Area Plan 2020-2026

The Municipal District Local Area Plan (LAP) is part of a systematic hierarchy of land use and spatial plans including Project Ireland 2040 – National Planning Framework, the Regional Planning Guidelines for the South-West 2010-2022, the draft Regional Spatial and Economic Strategy for the Southern Region and the Kerry CDP 2015-2021. In order to develop policies and objectives that are appropriate to the needs and future potential of the settlements of the Listowel Municipal District, this LAP has framed its overall development strategy within the context of the settlement hierarchy set out in the Kerry CDP 2015-2021. The overall strategic development objectives relevant to the Proposed Development include:

- Overall Development Strategy:
 - **OS-02:** *Prioritise the regeneration and renewal of the Municipal District's towns, villages and rural nodes in order to support vibrant and strengthened communities and drivers of economic growth. In line with this the renewal of underutilised buildings will be emphasised, while all new future residential and retail development shall be located in the town / village where lands have been identified for their use.*
 - **OS-05:** *Provide for the development of the area in a manner which is environmentally sustainable and protects its social, cultural, environmental, and economic assets for future generations.*
 - **OS-06:** *Facilitate the development of local employment opportunities in locations compatible with surrounding uses.*
 - **OS-08:** *Support the sustainable development of the land zoned within the Tarbert / Ballylongford area in accordance with the policies and objectives of the SIFP and the KCDP.*
- Natural Environment:
 - **LS-NE-03:** *Support KCC's Climate Change Adaption Strategy 2019 – 2024.*

15.2.3 Other Legislation, International Policy, Standards and Guidance

Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022)

The 2014 amendment to the 2011 EIA Directive (2014/52/EU) directs that population and human health factors be assessed in an Environmental Impact Assessment (EIA).

The 2022 EPA Guidelines state that: “*while no specific guidance on the meaning of the term Human Health has been issued in the context of Directive 2014/52/EU, the same term was used in 3.3.6 the SEA Directive (2001/42/EC). The Commission's SEA Implementation Guidance states ‘The notion of human health should be considered in the context of the other issues mentioned in paragraph (f)’.* Paragraph (f) (of Annex I of the SEA Directive) lists the environmental factors including soils, water, landscape, air etc.).

The 2022 EPA Guidelines also note that in an EIAR: *“the assessment of impacts on population & human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in the EIAR e.g., under the environmental factors of air, water, soil, etc.” and that “assessment of other health & safety issues are carried out under other EU Directives, as relevant. These may include reports prepared under the Integrated Pollution Prevention and Control, Industrial Emissions, Waste Framework, Landfill, Strategic Environmental Assessment, Seveso III, Floods or Nuclear Safety Directives. In keeping with the requirement of the amended Directive, an EIAR should take account of the results of such assessments without duplicating them”.*

London Healthy Urban Development Unit: Rapid Health Impact Assessment Tool (4th Edition)

The Institute of Public Health in Ireland (IPHI) have published the Health Impact Assessment (HIA) Guidance, there is no consolidated methodology or practice for describing human health in the EPA Guidelines. Therefore, the impacts of the Proposed Development on human health will be assessed qualitatively using the relevant human health determinants outlined in the London HUDU *Rapid Health Impact Assessment Tool*.

The London HUDU *Rapid Health Impact Assessment Tool*³, published in October 2019, is designed to assess the likely health impacts of development plans and proposals. The toolkit helps to identify determinants of health which are likely to be influenced by a specific development proposal, as well as issues directly or indirectly influenced by planning decisions. The way in which the London HUDU *Rapid Health Impact Assessment Tool* has supported the human health assessment as detailed in Section 15.3 Methodology.

Health Impact Assessment Guidance: A Manual (Institute of Public Health, 2021)

The Institute of Public Health published this manual⁴ to guide decision makers to build healthier communities and reduce health inequalities. The new HIA Guidance assists policy and decision-makers at national, regional, and local levels to assess the potential impact of a proposed new law, policy, programme, or project and how it might affect the health of the community before it is implemented.

Health in Environmental Impact Assessment 2017 (IEMA, 2017)

This guidance⁵ was published following the 2017 changes to the EIA regulations that clarified that population and human health should be considered in an EIA.

It suggests that five key principles should underpin health in EIA:

1. Comprehensive approach to health: Consider the wider determinants of health and wellbeing.
2. Proportionate: agree with stakeholders a focus on only the likely significant health effects of a project.
3. Consistency: work in accordance with up-to-date policy, guidance, and scientific consensus.
4. Equity: consider the distribution of health effects across a population and if appropriate take action.

³ NHS (2019). *HUDU Planning for Health: Rapid Health Impact Assessment Tool*.

⁴ IPHI (2021). *Health Impact Assessment Guidance: A Manual*.

⁵ IEMA (2017). *Health in Environmental Impact Assessment*.

5. Reasonableness: deliver an objective assessment based on evidence and on sound judgment.

Determining Significance for Human Health in Environmental Impact Assessment (IEMA, 2022)

IEMA published this guidance⁶ in 2022 to promote greater consistency in the EIA health assessment process. This guidance identifies a range of factors that influence human health, termed the 'wider determinants of health', which span the bio-physical, social, behavioural, economic, and institutional factors, and provides a framework for concluding on the significance of population health effects that can be applied across the wider determinants of health. The framework includes assessing where there are opportunities to improve the development in favour of better population health outcomes and respond to potential inequalities and addresses inequalities and population health as environmental outcomes of a project.

Addressing Human Health in Environmental Impact Assessment (IAIA & EUPHA, 2019)

This paper⁷ provides principles and good practice for addressing health in EIA. EIA is governed by the EIA Directive 2011/92/EU, as amended by 2014/52/EU ('EIA Directive'). Article 3 of the amended EIA Directive names human health among the topics to be addressed when conducting an EIA. Therefore, this paper was prepared in order to address the challenges of integrating health in environmental assessments. It highlights that a range of determinants act on people's health, such as socioeconomic status, gender, and other environmental and social determinants, which need to be considered in a HIA to inform policies, programs, plans, and projects.

15.3 Methodology

15.3.1 Study Area

The study area for the population and human health assessment has considered the area of land that encompasses the likely effects of the Proposed Development. The area used for the baseline analysis comprises the Listowel, Newcastle West and Kilrush Local Electoral Areas (LEAs), as this is where the majority of population and human health effects are likely to occur.

15.3.2 Determination of the Baseline Environment

In order to assess the potential effects associated with the Proposed Development, it is necessary to determine the baseline conditions, resources, and receptors in the Site and surrounding area.

The identification of the baseline conditions therefore involves predicting changes that are likely to happen in the intervening period, for reasons unrelated to the Proposed Development.

The baseline section of this chapter includes a description of local communities within the study area and a profile of the people who reside within these communities. This profile comprises an analysis of population and population growth, age, demographics, and health determinants. The presence of any vulnerable groups which could be disproportionately affected by the impacts of the Proposed Development are also identified in the baseline. The findings of the public consultation exercise are also

⁶ IEMA (2022). *Determining Significance for Human Health In Environmental Impact Assessment*.

⁷ IAIA and EUPHA (2019). *Addressing Human Health in Environmental Impact Assessment*.

summarised in Chapter 6 of this EIAR and the supporting appendices in Volume II of the EIAR. The baseline also includes a description of land uses in the local area, including the presence of:

- Private residential buildings and commercial properties.
- Community land (e.g., common land, village greens, open green space, allotments, sports pitches etc.).
- Community facilities (e.g., village halls, healthcare facilities, education facilities, religious facilities etc.).
- Land allocated for employment and residential development by local authorities.

15.3.3 Determination of Sensitive Receptors

The sensitivity of the existing environment identifies the ability of the receptor to respond to potential effects. Receptors in the population and human health assessment are members of the local and wider community which have the potential to be impacted by any of the effects described. The following section identifies the methodology for defining the sensitivity of receptors for each type of potential effect identified. Terminology used to describe the sensitivity of the receptor is as per the EPA Guidelines (2022). The assessment of human health is assessed using the HUDU guidance⁸.

15.3.3.1 Land Use

The value and descriptors which have been applied to determine sensitivity have been based on professional judgement. Examples of the sensitivities assigned to different land uses are identified in Table 15.1. It is important to note that other criteria are also used to inform the sensitivity of a resource to potential change. This includes how often the resource is used, how many users the resources have, and whether the resource is maintained.

Table 15.1: Examples of Sensitivities Assigned to Different Land Uses

Sensitivity	Description
High	• Private residential buildings, or land allocated for development of housing. • Buildings used for employment use, and land allocated for development of employment uses. • Regularly used community buildings which have only limited alternatives available nearby. • National or regional walking, cycling and horse-riding routes, and other routes regularly used by vulnerable travellers such as the elderly. • Designated public open spaces, or open spaces which attract users nationally e.g., national parks. • Religious sites and cemeteries. • Regularly used agricultural land where the enterprise is dependent on the spatial relationship of the land to key agricultural infrastructure.
Medium	• Land associated with private residential buildings e.g., gardens. • Community buildings which are regularly used or where there are only limited alternatives available in the local area. • Open spaces which span over a regional area and attract visitors from a regional catchment e.g., country parks, forests. • Public rights of way and other routes close to communities which are used for recreational or utility purposes, but for which alternative routes can be taken. • Agricultural land holdings which are used semi-regularly and where the enterprise is partially dependent on the spatial relationship of land to key agricultural infrastructure.

⁸ NHS (2019). *HUDU Planning for Health: Rapid Health Impact Assessment Tool*.

Sensitivity	Description
Low	- Community buildings which are infrequently used or where there are many alternatives available in the local area. - Open spaces which are used for informal recreation (e.g., dog walking), and where there are alternative open spaces available. - Locally used community land e.g., local parks and playing fields. - Walking, cycling and horse-riding routes which have fallen into disuse through past severance, or which are scarcely used because they do not currently offer a meaningful route for either utility or recreational purposes. - Agricultural land which is used semi-regularly but where the enterprise is not dependent on the spatial relationship of land to key agricultural infrastructure.
Negligible	- Derelict or unoccupied buildings. - Agricultural land which is infrequently used on a non-commercial basis.

15.3.3.2 Severance

The receptors which have potential to experience severance effects are local residents who use the roads and walking / cycling routes to travel in and around the study area to commercial properties, community facilities, places of work, and educational facilities. No sensitivity values are assigned to receptors with potential to experience severance effects.

15.3.3.3 Employment

The receptor with potential to experience employment effects is the workforce in Counties Kerry, Clare and Limerick. This includes the workforce in the construction industry and the local supply chain. No sensitivity values are assigned to receptors with potential to experience employment effects.

15.3.3.4 Human Health

The effects on human health are assessed using guidance set out in the HUDU *Rapid Health Impact Assessment Tool*. Sensitivities are not defined for receptors.

15.3.4 Describing Potential Effects and Significance Criteria

Effects on land use, severance, and economic activity are described using the criteria provided in the EPA Guidelines (2022). The process to determine potential effects is described in Chapter 1 (Introduction). In summary, it involves combining the sensitivity of a receptor with a description of an impact on that receptor (its quality, type, frequency, duration, probability, and magnitude) to determine a significance of impact. Detail on the criteria used to determine the sensitivity of a receptor is included in section 15.3.3. This section describes, for each type of effect, the assessment criteria which informs the description of the impact. This includes the parameters which define a direct or indirect effect, and how a magnitude of effect is determined.

Since the EPA Guidelines (2022) do not provide extensive guidance on assessing human health, the assessment of human health is instead based on guidance set out in the HUDU *Rapid Health Impact Assessment Tool*⁹. The assessment method used to determine human health effects is also identified in the following sections.

⁹ NHS (2019).

15.3.4.1 Land Use

The land use assessment includes all direct and indirect effects on community resources and private assets in the study area. Direct effects include land-take and / or impacts on access, *i.e.*, properties and / or facilities being cut off or split. Indirect effects include impacts on the amenity of residents of properties and / or users of community resources in the study area. Depending on the type of land use effect being assessed, the magnitude of the impact is determined by:

- The amount of land to be taken or the number of properties to be demolished.
- The extent to which access to community resources or private property is impacted; and
- The number of users and the extent to which these users experience impacts on their amenity.

This assessment draws upon the assessment findings Chapter 7 (Air Quality), Chapter 11 (Noise and Vibration), and Chapter 14 (Traffic and Transport).

15.3.4.2 Severance

Severance is defined as the separation of residents from facilities and services they use within their community caused by new or improved roads or by changes in traffic flows. The Proposed Development could cause severance effects by changing levels of traffic congestion on existing roads and / or introducing traffic management measures. This may lead to separation of residents from facilities and services which they use.

All severance impacts are direct impacts. The assessment of magnitude is informed by the assessment results presented in Chapter 14 (Traffic and Transport). It is determined by:

- The extent of the physical changes caused by the Proposed Development.
- The consequent changes in traffic levels on existing roads.
- The number of people whose journey will be affected.
- The type of road involved; and
- The mitigation measures implemented.

The criteria used to determine the magnitude of effect of severance is outlined in Table 15.2.

Table 15.2: Criteria Used to Assess Magnitude of Effect of Severance

Magnitude of Effect	Description
High	People are likely to be deterred from making trips to an extent enough to induce reorganisation of their habits. Considerable hindrance will be caused to people who experience such severance on trips which they regularly carry out.
Medium	Some people are likely to be dissuaded from making trips. Other trips will be made longer or less attractive.
Low	In general, the current journey pattern is likely to be maintained, but there will probably be some hindrance to movement.
Negligible	There will be a very limited impact on people's movement and current journey patterns will be maintained.

15.3.4.3 Employment

This assessment considers the impact on the workforce in Counties Kerry, Clare and Limerick. The Proposed Development may provide direct and indirect job opportunities.

Direct jobs include the temporary workforce required to construct the Proposed Development in the short to medium term, as well as the workforce required to operate the facility in the longer term.

Indirect jobs include those created in the supply chain to provide material, specialist labour, and demolition and remediation services for the workforce. There is no consolidated methodology or practice for assessing the magnitude of the impact on employment in EPA Guidelines (2022). It has therefore been assessed based on best practice of previous projects in which the size of the workforce in the impact area is considered, relative to the number of jobs that the Proposed Development will create.

15.3.4.4 Determining Significance

Once the magnitude of the impact has been identified, this can be cross-referenced with the sensitivity of the receptor to derive the overall significance of impact as per the EPA Guidelines (2022). By bringing together magnitude and sensitivity, the assessment considers the classification of the effects as outlined in Table 15.3.

Table 15.3: Classifications of the Significance of Effects

Sensitivity of Receptors	Magnitude of Effect			
	High	Medium	Low	Negligible
High	Very significant	Significant	Slight	Not significant
Medium	Significant	Moderate	Slight	Imperceptible
Low	Moderate	Slight	Slight	Imperceptible
Negligible	Imperceptible	Imperceptible	Imperceptible	Imperceptible

15.3.4.5 Human Health

The human health assessment includes impacts on the health of residents of properties and users of community resources in the study area. Whilst relevant guidance from the Institute of Public Health in Ireland (IPHI), specifically the *Health Impact Assessment Guidance*¹⁰, has been considered, there is no consolidated methodology or practice for describing effects on human health in the EPA Guidelines (2022). The impacts of the Proposed Development on human health has therefore been assessed qualitatively using the human health determinants set out in the *London HUDU Rapid Health Impact Assessment Tool*.

A checklist approach has been used to provide a broad overview of the potential health impacts and is applicable to a wide range of proposals. The checklist is split into 11 broad determinants and is based on the WHO publication '*Healthy Urban Planning*'.

The WHO Europe defines health as "a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity"¹¹. Consequently, public health encompasses general

¹⁰ IPHI (2021). *Health Impact Assessment Guidance*.

¹¹ WHO (2006). *Constitution of the World Health Organisation*.

wellbeing, not just the absence of illness. Some effects are direct and obvious, others are indirect, while some may be synergistic, with different types of impact acting in combination. In keeping with this definition, this assessment considers the potential impacts of the Proposed Development on physical, mental, and social health.

Factors that have the most significant influence on the health of a population are called 'determinants of health'; these include an individual's genetics and their lifestyle, the surrounding environment, as well as political, cultural, and societal issues. The interrelationship between these factors is shown in Plate 15.1.

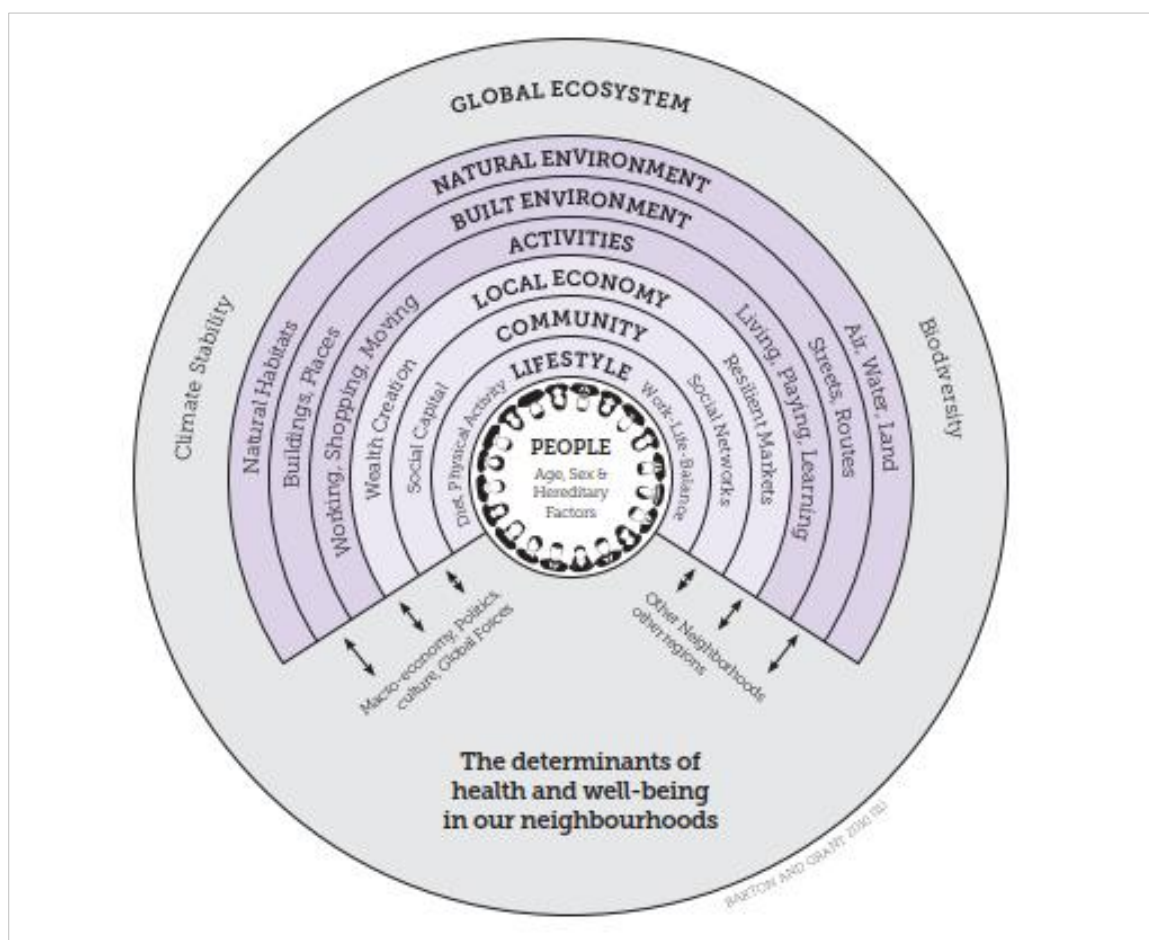


Plate 15.1: Social Determinants of Health¹²

An initial scoping exercise was undertaken to determine the criteria within the HUDU guidance which is relevant to this assessment. The criteria which has been assessed as part of this chapter is provided in the following bullet points. Other criteria in HUDU guidance¹³ but not in the following list, have been scoped out:

- Access to open space and nature.
- Access to employment and social infrastructure (severance).

¹² Barton and Grant (2006).

¹³ NHS (2019).

- Air quality, noise, and neighbourhood amenity.
- Climate change.

The assessment of human health is a qualitative rather than quantitative assessment, due to the diverse nature of health determinants and health outcomes which are assessed. Although the assessment of human health effects describes the likely qualitative health outcomes, it is not possible to quantify the severity or extent of the effects which give rise to these impacts. As such, the potential health impacts are described as outlined in Table 15.4, based on broad categories for the qualitative effects identified. Where a likely significant effect has been identified, actions have been recommended to mitigate any negative impact on health, or opportunities to enhance health benefits. It should be noted that in many cases, embedded mitigation to reduce these effects or measures to enhance certain benefits already form part of the Proposed Development and the assessment has considered these impacts as such.

Table 15.4: Human Health Impact Categories

Impact category	Impact symbol	Description
Positive	+	A beneficial impact is identified
Neutral	0	No discernible health impact is identified
Negative	-	An adverse impact is identified
Uncertain	?	Where uncertainty as to the overall impact

15.3.5 Limitations and Assumptions

This population and human health assessment is based on professional judgement and considers both the adverse and beneficial impacts that the Proposed Development can have upon existing and surrounding receptors.

The assessment is based on information available at the time of drafting the chapter. It draws upon other specialist topic inputs to aid the assessment of the impact of the Proposed Development on population and human health receptors.

Community resources are mentioned expressly in the environmental baseline only where they contribute to the local context or where they may be affected by the Proposed Development. Consequently, not all community resources within the study area are mentioned.

15.4 Baseline Environment

15.4.1 Data Sources

The following data sources were used to inform the baseline and gain an understanding of the community in the study area:

- A review of relevant local policy documents including the Kerry CDP, Clare CDP, Limerick DP and the Listowel Municipal District Local Area Plan 2020-2026.

- Central Statistics Office (CSO) relating to the 2022 and 2016 Census (note that 2016 data was only used where 2022 Census data has not been released).
- Spatial information relevant to planning applications and decisions in Ireland from MyPlan.ie and An Bord Pleanála within a 5km radius of the Site boundary (accessed 18 October 2023).

15.4.2 Overview

The Proposed Development is located within the SSE Tarbert site, in Tarbert, north of County Kerry. The study area for this analysis has been defined as Listowel, Newcastle West and Kilrush LEAs. Residents within this LEAs are most likely to experience effects from the Proposed Development. The following analysis compares statistics regarding the population in the study area with those in Co. Kerry, Co. Clare, Co. Limerick and Ireland as a whole.

This section establishes a comprehensive and coherent socio-economic and human health profile of the study area, including consideration of the labour market and health indicators. Dependent on the availability of data from the CSO, the baseline section presents analysis of socio-economic indicators which provide the narrative and evidence base of the current status of the area surrounding the Site. Baseline analysis in this section sets the context for the potential impacts of the Proposed Development.

15.4.3 Population

According to the 2022 Census, there are 80,607 residents in the study area (29,285 persons in Listowel, 29,033 persons in Newcastle West and 22,289 persons in Kilrush). Plate 15.2 displays the average of the combined age breakdown for both LEAs along with comparators of Co. Kerry, Co. Clare, Co. Limerick and Ireland as a whole.

The population of the combined LEAs contains more residents aged 65 or over (20.4%) compared to Co. Kerry (18.9%), Co. Limerick (16.0%), Co. Clare (16.9%), and the national average in Ireland (15.1%). The working age population (aged 15 to 64) is slightly lower in the study area at 60.7% compared to 62.7% in Co. Kerry, 65.1% in Limerick, 63.5% in Co. Clare, and 65.3% nationally. The proportion of residents aged 0 to 14 (18.9%) is similar to that of Co. Kerry (18.4%) and Co. Limerick (18.8%), and slightly below the national average (19.7%) and Co. Clare (19.5%).

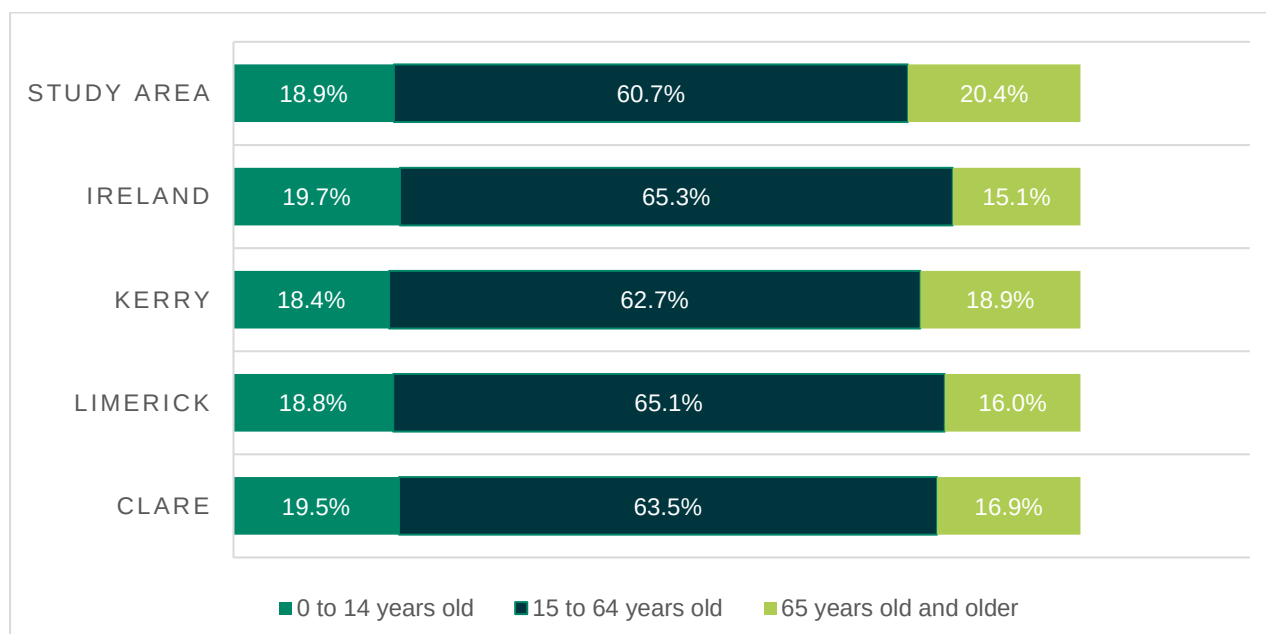


Plate 15.2: Age Breakdown¹⁴

15.4.3.1 Deprivation

The Podal HP Deprivation Index is the primary source for deprivation in Ireland. It combines three dimensions of affluence or disadvantage (demographic profile, social class composition, and labour market situation) to provide a Relative Index Score for every Small Area in Ireland. The Relative Index Scores are normally distributed around a bell-shaped curve to display the current levels of deprivation compared to other areas, with most areas clustered around the mean and comparatively fewer areas exhibiting extreme levels of affluence or deprivation. The seven classifications for deprivation range from extremely affluent to extremely disadvantaged.

According to latest available data, the majority of the Electoral Divisions (EDs) within the Listowel and Kilrush LEA were classified as 'marginally below average' (4th least deprived rank out of seven classifications) in 2022, including Tarbert with a relative score of 4.78 (Plate 15.3). A single ED within Listowel LEA (*i.e.*, Ballyhorgan) is 'marginally above average' while other two (*i.e.*, Carrig and Ardagh) are 'disadvantaged'. Within the Newcastle West LEA, EDs on the south-west are classified as 'marginally below average' while those to the north-east are 'marginally above average'. There are five EDs within Kilrush LEA (*i.e.*, Kilballyowen, Moveen, Killofin, Kilkee and Kilrush Urban) classified as 'disadvantaged' while five EDs towards the south-east (*i.e.*, Clondagad, Kilcloher, Killanniv, Lisheen, and Killone) 'are marginally above average'.

¹⁴ CSO (2022).

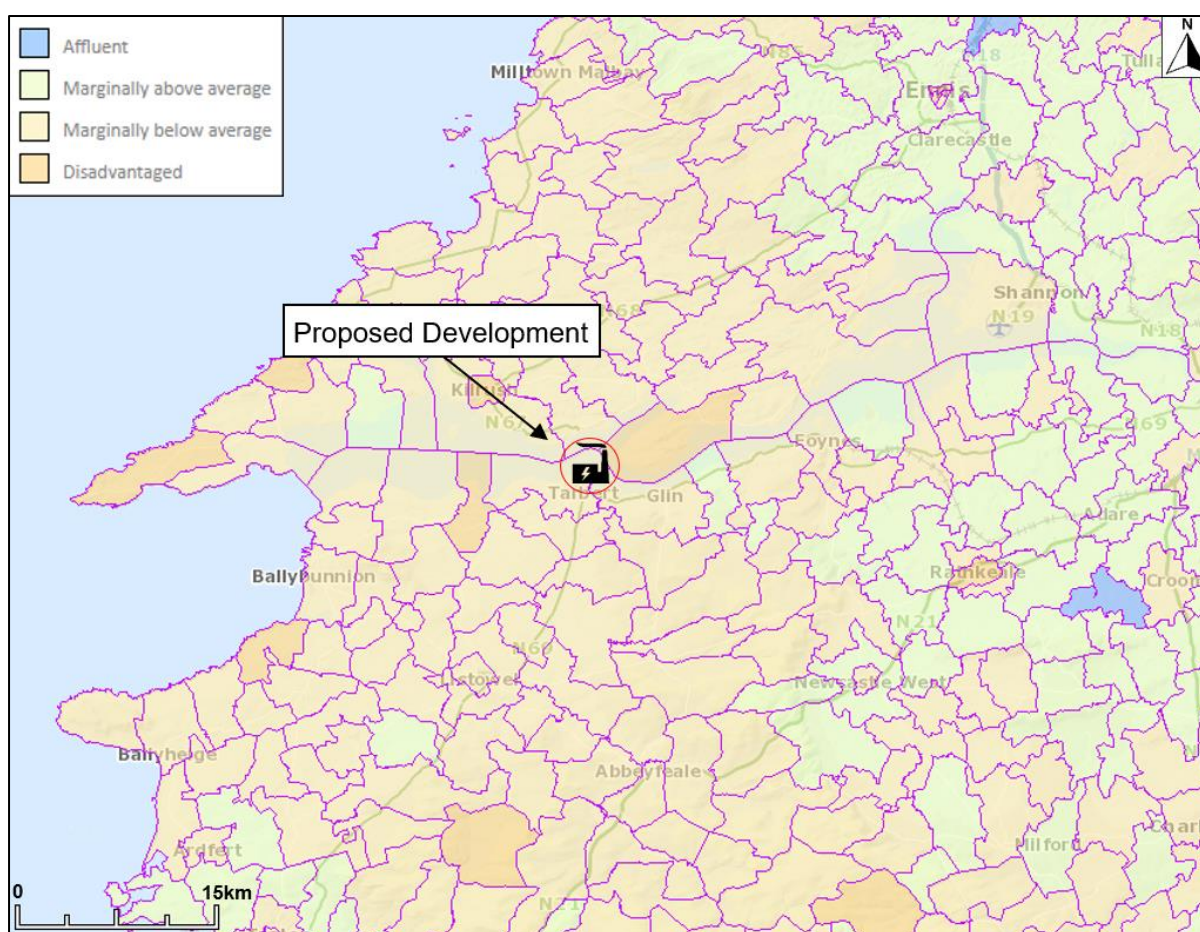


Plate 15.3: Deprivation Index¹⁵

15.4.3.2 Education and Skills

In terms of educational attainment, the study area is relatively level with Co. Kerry, Co. Clare, Co. Limerick, and Ireland for most categories except Postgraduate diploma or degree, as shown in Table 15.5. For example, 20.1% of working age residents in the study area are educated to upper secondary level, in line with 19.2% in Co. Kerry, 18.4% in Co. Limerick, 19.8% in Co. Clare and 18.1% nationally. However, the proportion of inhabitants in the study area with a postgraduate diploma or degree is just over half that of the national average. Overall, the proportion of inhabitants educated to bachelor's degree level (or equivalent) or higher in the study area is 24.2% which is lower than the rate for Co. Kerry (28.4%), Co. Limerick (30%), Co. Clare (31.4%) and Ireland (33.7%). In contrast, 10.2% and 17.2% of residents have completed primary and lower secondary education respectively, a higher proportion than in Co. Kerry (8.2% and 14.8% respectively), Co. Limerick (8.0% and 14.5% respectively), Co. Clare (7.0% and 13.1% respectively) and nationally (10.0% and 13.2% respectively).

¹⁵ Irish Deprivation Index (Pobal, 2022).

Table 15.5: Highest Level of Education Completed¹⁶

Level of Education	Study Area	County Kerry	County Limerick	County Clare	Ireland
No formal education (%)	2.9	2.5	2.3	2.0	2.4
Primary (%)	10.2	8.2	8.0	7.0	10.0
Lower secondary (%)	17.2	14.8	14.5	13.1	13.2
Upper secondary (%)	20.1	19.2	18.4	19.8	18.1
Technical / vocational (%)	8.1	8.1	7.2	7.9	7.5
Advanced certificate / completed apprenticeship (%)	7.4	6.8	5.7	6.5	5.6
Higher certificate (%)	5.8	6.1	5.4	5.9	5.5
Ordinary bachelor's degree/professional qualification or both (%)	7.6	8.5	7.3	8.4	8.1
Honours bachelor's degree/professional qualification or both (%)	9.8	11.2	12.5	12.4	13.3
Postgraduate diploma or degree (%)	6.4	8.0	9.2	9.7	11.2
Doctorate (Ph.D.) (%)	0.4	0.7	1.0	0.9	1.1
Not stated (%)	4.1	5.8	8.3	6.4	6.5

15.4.3.3 Employment

There are 33,699 persons at work in the study area, which is approximately 51.6% of the total population and slightly below the national average of 56.1%, as shown in Table 15.6. The study area is relatively level with Co. Kerry, Co. Clare, Co. Limerick, and Ireland in terms of principal economic status of the population, although it has a slightly lower percentage of students (9.3%) compared to Co. Kerry (9.8%), Co. Limerick (12.2%), Co. Clare (11.4%), and Ireland (11.1%), and a slightly higher percentage of retirees (20.6%) compared to Co. Kerry (19.3%), Co. Limerick (16.8%), Co. Clare (17.8%) and Ireland (15.9%). The existing Tarbert HFO Power Station currently employs 14 No. persons as of Q3 2023 and is due to cease operating in December 2023.

Table 15.6: Principal Economic Status (aged 15+ years)¹⁷

Principal Economic Status	Study Area	County Kerry	County Limerick	County Clare	Ireland
At work	51.6	52.9	53.3	54.5	56.1
Looking for first regular job (%)	0.7	0.9	0.8	0.8	0.8
Unemployed having lost or given up previous job (%)	4.1	4.4	4.2	4.0	4.3
Student (%)	9.3	9.8	12.2	11.4	11.1
Looking after home/family (%)	7.6	6.9	6.5	6.4	6.6
Retired (%)	20.6	19.3	16.8	17.8	15.9
Unable to work due to permanent sickness or disability (%)	5.5	5.1	5.8	4.3	4.6
Other (%)	0.7	0.8	0.5	0.7	0.7

¹⁶ CSO (2022).

¹⁷ CSO (2022).

15.4.3.4 Social Class

The 2022 Census also provides a breakdown of the total population by 'social class'. These groupings are based on the level of skill and education attainment of their occupation. For the population which does not work, the social class of the person which they are deemed to depend on is attributed to them (as per guidance issued by the CSO). As shown in Table 15.7, the study area has a lower proportion of residents who are categorised as 'professional' (6.5%) and 'managerial and technical' (29.5%) compared to Co. Kerry (7.2% and 29.5% respectively), Co. Limerick (9.8% and 27.5% respectively), Co. Clare (8.7% and 30.8% respectively) and Ireland as a whole (9.3% and 30.7% respectively). The proportion of skilled manual (16.1%) and semi-skilled (13.0%) is slightly higher compared to Co. Kerry (14.7% and 12.0% respectively), Co. Limerick (12.2% and 11.0% respectively), Co. Clare (13.3% and 11.3% respectively) and Ireland as a whole (12.9% and 11.2% respectively).

Table 15.7: Social Class¹⁸

Social Class	Study Area	County Kerry	County Limerick	County Clare	Ireland
Professional workers (%)	6.5	7.2	9.3	8.7	9.3
Managerial and technical (%)	29.5	29.5	27.5	30.8	30.7
Non-manual (%)	16.2	16.5	15.4	16.0	16.2
Skilled manual (%)	16.1	14.7	12.2	13.3	12.9
Semi-skilled (%)	13.0	12.0	11.0	11.3	11.25
Unskilled (%)	3.6	3.3	3.3	3.2	3.1
All others gainfully occupied and unknown (%)	15.0	16.7	21.3	16.6	16.6

15.4.3.5 Live Register

The Live Register is used to provide a monthly series of the numbers of people (with some exceptions) registering for Jobseekers Benefit (JB) or Jobseekers Allowance (JA) or for various other statutory entitlements at local offices of the Department of Social Protection. Table 15.8 shows that the proportion of residents in Co. Limerick on the Live Register in June 2023 (3.6%) was the same as the national average (3.6%), while it was slightly higher in Co. Kerry (4.7%) and Co. Clare (3.7%). The CSO stated that County Kerry was one of four counties that showed an increase in the number of people on the Live Register from July 2023 (2.6%).

Table 15.8: Live Register¹⁹

	Claimants	%
Co. Kerry	7,295	4.7%
Co. Limerick	7,503	3.6%
Co. Clare	4,703	3.7%
Ireland	186,396	3.6%

¹⁸ CSO (2022).

¹⁹ CSO (2023).

15.4.4 Land Use

Land use in the surrounding area is summarised in Table 15.9.

Table 15.9: Land Use

Site Boundary	Land Use
North	Tarbert Lighthouse and the Shannon Estuary.
South	Two electrical transmission substations (110kV to south-east and 220kV directly south and a lagoon south of the 220kV substation draining to the Shannon Estuary and with agricultural lands further south on the mainland, and the National Oil Reserves Agency (NORA) tank farm to the south-west.
East	The N67 National Secondary Road and the Shannon Estuary.
West	The Shannon Estuary.

A timeline of the SSE Tarbert site development and changes since it was developed from greenfield in 1966 is summarised in Table 15.10.

Table 15.10: Site Operational Timeline

Year	Operation
1966	Construction started on the ESB Tarbert Power Station.
1969	ESB Tarbert Power Station Unit One and Two becomes operational.
1976/77	Units Three and Four operational
2003	ESB Tarbert receives its Industrial Emissions (IE) Licence from the EPA (P0607-01).
2005	ESB Tarbert receives its current IE Licence from the EPA (P0607-02).
2009	Power station sold by ESB to Endesa
2012	Power station sold by Endesa to SSE
2023	Construction started on the TEG project

OSI maps show that that historical land use at the Site was as low-lying grassland land. The island portion of the SSE Tarbert site which includes the Proposed Development Site, was divided into fields and included with a lighthouse, several piers and slipways, a coastguard station and previous naval artillery facilities prior to the construction of the original Tarbert HFO Power Station. The Site is located on the southern shore of the Shannon Estuary, on Tarbert Island, originally agricultural land and made ground (*i.e.*, infilled / reclaimed land), connected to the mainland via a causeway.

15.4.5 Human Health

The results of a self-assessment of health in the 2022 Census are shown in Table 15.11. On average, general health in the study area is relatively level with Co. Kerry, Co. Clare, Co. Limerick, and Ireland. Approximately, 51.3% of residents in the study area self-assessed their health as 'very good' compared to slightly higher national rates (53.2%), but similar to Co. Kerry (51.7%), Co. Clare (51.8%) and Co. Limerick (49.4%). However, the proportion of the population in the study area who self-assessed their health as 'good' (33.3%) is slightly higher than Co. Kerry (31.7%), Co. Limerick (30.2%), Co. Clare (31.0%) and Ireland (29.7%). In addition, 1.8% of residents in the study area described their health as

'bad' or 'very bad', a similar proportion to Co. Kerry (1.7%), Co. Limerick (2.0%), Co. Clare (1.7%) and in Ireland (1.7%).

Table 15.11: Population by General Health²⁰

Self-Assessed Health	Study Area	County Kerry	County Limerick	County Clare	Ireland
Very Good (%)	51.3	51.7	49.4	51.8	53.2
Good (%)	33.3	31.7	30.2	31	29.76
Fair (%)	9.9	9.2	9.1	9	8.6
Bad (%)	1.5	1.4	1.6	1.4	1.4
Very bad (%)	0.3	0.3	0.4	0.3	0.3
Not stated (%)	3.7	5.7	9.4	6.6	6.7

The number of residents (as a percentage of total population) who live with a disability in the study area (22.8%) is similar to that of Co. Kerry and Ireland as a whole (21.6% and 21.5% respectively), and Co. Limerick (22.6.0%). The number of persons with disabilities within the study area is evenly distributed amongst people identifying as males (11.3%) and females (11.6%) (other expressions of gender-identity are not identified within the census data).

The 2022 Census does not provide further information on health limitations or physical activity data by local area. However, the Irish Health Survey provides further detail on health profiles at a regional level²¹.

The Irish Health Survey reports the mental health status of residents (aged 15 and over) at regional and national level. In 2019, 86% of Irish residents stated they experience no or minimal depression, which was slightly higher than across the south-west region (83%) and similar to the mid-west (87%). The full mental health statistics for the south-west and Ireland are shown in Table 15.12, which indicates that, on the whole, residents in the south-west experience slightly higher levels of depression compared to residents across the mid-west and the country.

Table 15.12: Mental Health Indicators²²

Mental Health Indicator	South-west	Mid-west	Ireland
None to minimal depression (%)	83	87	86
Mild depression (%)	11	9	9
Moderate depression (%)	4	2	3
Moderately severe or severe depression (%)	3	2	2

There is one healthcare facility in the surrounding area to the Site: Tarbert Medical Centre, approximately 1.5km south of the Site. The nearest hospital is Listowel Community Hospital,

²⁰ CSO (2022).

²¹ CSO (2019). *Irish Health Survey 2019*.

²² CSO (2019). *Irish Health Survey 2019*.

approximately 18km south-west, but the closest major hospital facility is the University Hospital Kerry, located approximately 42km south-west of the Site.

15.4.6 Travel Patterns and the Existing Transport Network

Table 15.13 illustrates travel time to work, school, or college for residents in the study area and its comparator areas. It shows that on average, a lower proportion of residents in the study area travel for half an hour or more compared to and the national average (31.8%), although this figure is higher than the averages for Co. Kerry (23.8%), Co. Limerick (25.2%) and Co. Clare (28.4%). However, like Co. Kerry (38.4%), Co. Limerick (30.1%), Co. Clare (33.7%) and Ireland (29.4 %), the majority of the residents in the study area commute for under 15 minutes (35.5%).

Table 15.13: Duration of Travel to Work, School, or College (population aged 5+ years)²³

Duration of Travel	Study Area	County Kerry	County Limerick	County Clare	Ireland
Under 15 mins (%)	35.5	38.4	30.1	33.7	29.4
1/4 hour - under 1/2 hour (%)	25.1	27.5	30.9	27.2	28.1
1/2 hour - under 3/4 hour (%)	16.5	14.2	16.1	16.8	17.3
3/4 hour - under 1 hour (%)	6.2	3.4	4.2	5.3	5.9
1 hour - under 1 1/2 hours (%)	6.1	3.7	3.3	4.5	6.1
1 1/2 hours and over (%)	2.5	2.5	1.6	1.8	2.5
Not stated (%)	8.1	10.2	13.6	10.6	10.7

In regard to mode of transport used to travel to work, school, or college (see Plate 15.4), the study area largely aligns with patterns in the comparator areas. Most residents in the study area travel by car (53.8%). This is also the most used mode in Co. Kerry (62.4%), Co. Limerick (58.0%), Co. Clare (65.5%) and Ireland as a whole (53.8%). Travelling on foot is the second most common method of transport across all areas except the study area, where more people travel by bus, minibus, or coach (7.2%) than on foot (6.9%).

²³ CSO (2022).

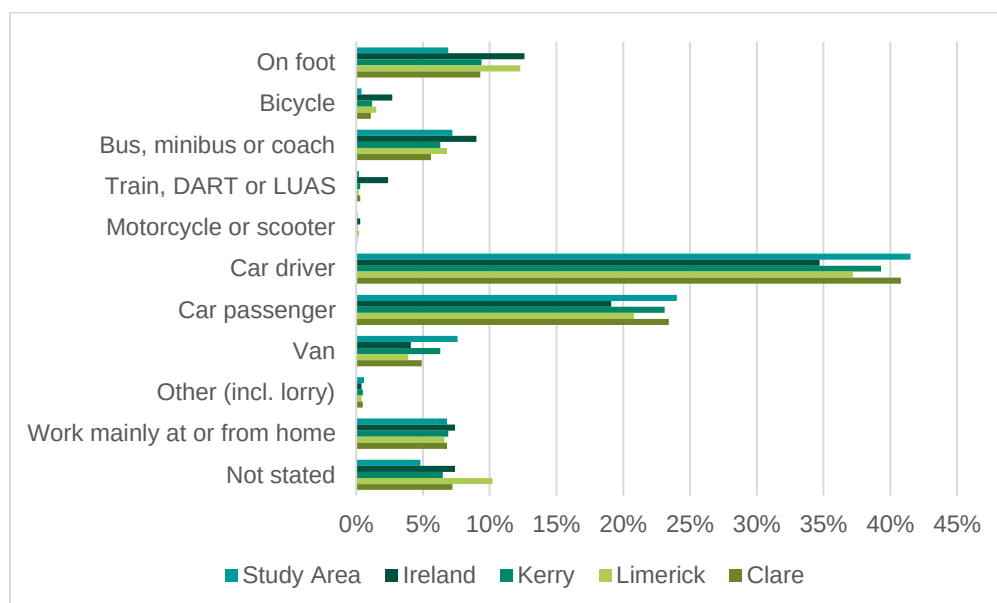


Plate 15.4: Means of travel to work, school or college (population aged 5+ years)²⁴

There is a ferry crossing from Tarbert to Killimer in Co. Clare located at the Tarbert Ferry Terminal, north of Tarbert and adjacent to the eastern boundary of the Proposed Development. This ferry crossing takes approximately 20 minutes and runs every hour from 07:00 to 21:30. This service allows people to transport car, coaches, bicycles, motorcycles and large commercial vehicles from Killimer in Co. Clare to Tarbert in Co. Kerry. This crossing reduces the need to drive around the Shannon Estuary (137km route).

Further information regarding traffic and transport is considered in Chapter 14 (Traffic and Transport).

15.4.7 Land Use

15.4.7.1 Local Community Facilities and Tourist Activities

The nearest community facilities to the Proposed Development are primarily located in the town of Tarbert which is approximately 1.8km from the Site boundary. Tarbert has two schools: Tarbert National School and Tarbert Comprehensive School and a pre-school (Wishing Tree Pre-School). There are also two churches (St. Mary's Roman Catholic Church and St. Brendan's Church of Ireland), a post office, a Garda station, an Urban Wastewater Treatment facility, multiple sport clubs (Tarbert GAA Club, Ferry Rangers Soccer Club, Shannonside Tarbert LGFA, Tarbert Rowing Club, Tarbert Island Maritime Club, Tarbert Pier Swimming Group) and a museum (Tarbert Bridewell Courthouse and Jail Museum). Recreational and amenity areas in Tarbert include the Tarbert Community Playground, John F. Leslie Woodland Walks, Tarbert House, Tarbert Fairy Trail, Illuminated Historical Bronzes, a Sensory Park, Streamside Stables and Tarbert Bird Hide (a birdwatching area).

The Shannon Estuary is well known for its unspoilt natural beauty and is home to Europe's largest group of bottlenose dolphins. Shannon Ferry Group Ltd. Operates the Killimer – Tarbert Car Ferry which links the main tourist routes of Ireland's Shannon Region on the popular "Wild Atlantic Way" from Killimer, Co. Clare to Tarbert, Co. Kerry. There are scheduled sailings daily, providing multiple attractions of

²⁴ CSO (2022).

Clare, Kerry and adjoining counties including the Dingle Peninsula, Loophead and the famous Cliffs of Moher.

The Shannon Regional Fisheries Board coastal boundaries extend from Hags Head on the Clare Coast and includes all of the Shannon Estuary to Limerick on the north side of the river, to Kerry head on the south side of the river. On the local maps there are 40 shore angling marks where excellent Ballan Wrasse can be taken as well as Mackerel, Pollack, Dogfish, Bull Huss, Ling and Conger.

Small boat fishing is available from Carrigaholt to Killadysert for thornback ray, bull huss, dogfish, conger, pollack and rockling.

Charter boats operating out of Kilrush, Killbaha and Carrigaholt for deep sea angling and have excellent inshore fishing in the Shannon Estuary for tope, bull huss, dogfish, thornback ray, conger, rockling and flatfish. Deep sea angling catches of blue shark, ling, pollack, coalfish, gurnard, etc. off Loop Head.

15.4.7.2 Commercial Facilities

Regarding commercial facilities, there are seven bars and / or restaurants in Tarbert, a hostel (Ferry House Hostel) and a bed & breakfast (Niamh Wall Bed and Breakfast (B&B)), a pharmacy (Tarbert Allcare Pharmacy) and a car dealership (Des Murphy Cars).

15.4.7.3 Planning Applications

A planning search of proposed and existing planning applications within 5km of the Proposed Development was undertaken in October 2023 (refer to Chapter 4 EIAR Volume I). The majority of planning applications captured within the search area are power related. Withdrawn, incomplete and small-scale (such as single dwelling applications) planning applications were not included.

15.5 Potential Impacts

15.5.1 Construction Phase

15.5.1.1 Land Use

The Site of the Proposed Development is located on the southern shore of the Shannon Estuary, on Tarbert Island, originally agricultural land and made ground (*i.e.*, infilled / reclaimed land), connected to the mainland via a causeway.

The Proposed Development is located in a primarily rural area outside local area plans zoning with the nearest residential property adjacent to the Site boundary. The Site is currently under the management of the Applicant.

The Site lies within the Strategic Development Location (SDL) at Tarbert / Ballylongford in North Kerry, and it is recognised for its potential as an Energy Hub and for industrial development at a regional and national level.

The Site comprises brownfield land, with the western portion being the former contractors yard and containing two disused galvanised sheds (former Mechanical Workshop and former Riggers' Store), a bunded concrete slab (Chemical Storage Compound) and a large vertical cylindrical tank in the north corner (Boiler Wash Effluent (BWE) tank) and the northern portion containing a variety of structures, including a vertical cylindrical Demineralised Water tank, horizontal, cylindrical, bunded sulphuric acid

tank, a caustic soda tank, the site Waste Water treatment system infrastructure (two caustic soda tanks and a disused ammonia tank within the water treatment building), a compressor house, a salt store and the Carpenter's workshop.

The surface of the Site consists of sealed tarmacadam and concrete (approximately 30%, mainly in the northern portion) and unsealed hardcore gravel and grassed areas (approximately 70%, mainly in the western portion).

The majority of the Site is generally flat and lies at an elevation of 3m to 5m above Ordnance Datum (AOD).

The Tarbert HFO Power Station is registered under "the COMAH Regulations 2015" as an "Upper Tier" establishment.

The existing dominant land use on the Site is industrial, as it is associated with power generation. Therefore, there are no effects associated with the change of land use for the Proposed Development activities.

Consequently, the Proposed Development will have no land use impacts during construction.

15.5.1.2 Severance

The study area of the Proposed Development is predominantly rural with limited public transport available. Local residents rely heavily on the local and regional road network to access workplaces, educational facilities, and community facilities. During the construction phase, HGV traffic, general delivery traffic and site operatives will all be required to travel to and from the Site.

The construction traffic will use both existing gated entrances to the Site.

Chapter 14 (Traffic and Transport) determines that the construction phase traffic will travel to and from the Site via the N67 and N69 National Roads.

The transport assessment finds that the percentage impacts at the junctions during peak periods range from 5% - 25%, therefore below the 30% 'significant' impacts threshold (TII Project Appraisal Guidelines for National Roads Unit 5.3 – Travel demand Projections, 2017). The impact of the Proposed Development construction traffic on the network is therefore considered to be Negligible. The increase in traffic volumes along the N67 and N69 National Roads is comfortably within the maximum capacity of the roads, resulting in a Negligible impact.

A Construction Traffic Management Plan (CTMP) has been prepared as part as this planning application (refer to EIAR Volume II Appendix 14B). All environmental protection measures contained within this EIAR have been incorporated into the CTMP, to minimise the potential impact of construction traffic. Therefore, it is not expected that there will be any congestion considerable enough to deter local residents from accessing workplaces, educational facilities or community facilities during the construction phase of the Proposed Development.

Therefore, the Proposed Development will have a Negligible impact on severance between local residents in the study area and the facilities which they use during the construction phase. Considering the frequency, extent, duration, and probability of the impact, the significance of effect is assessed to be Imperceptible.

15.5.1.3 Employment

As noted in Chapter 5 (Description of the Proposed Development), the construction phase of the Proposed Development will be up to 29 months.

During the construction period, employment opportunities will be created as a result of the works. Although these jobs are Temporary in nature, they represent a Positive economic impact that can be estimated as a function of the scale and type of construction.

Levels of employment will vary throughout the construction phase. The peak work force is expected to be up to 200 personnel per day, over an 11-month period. This is illustrated in Plate 15.5. Employment levels over the 29-month construction period is on average 130 total gross jobs per month.

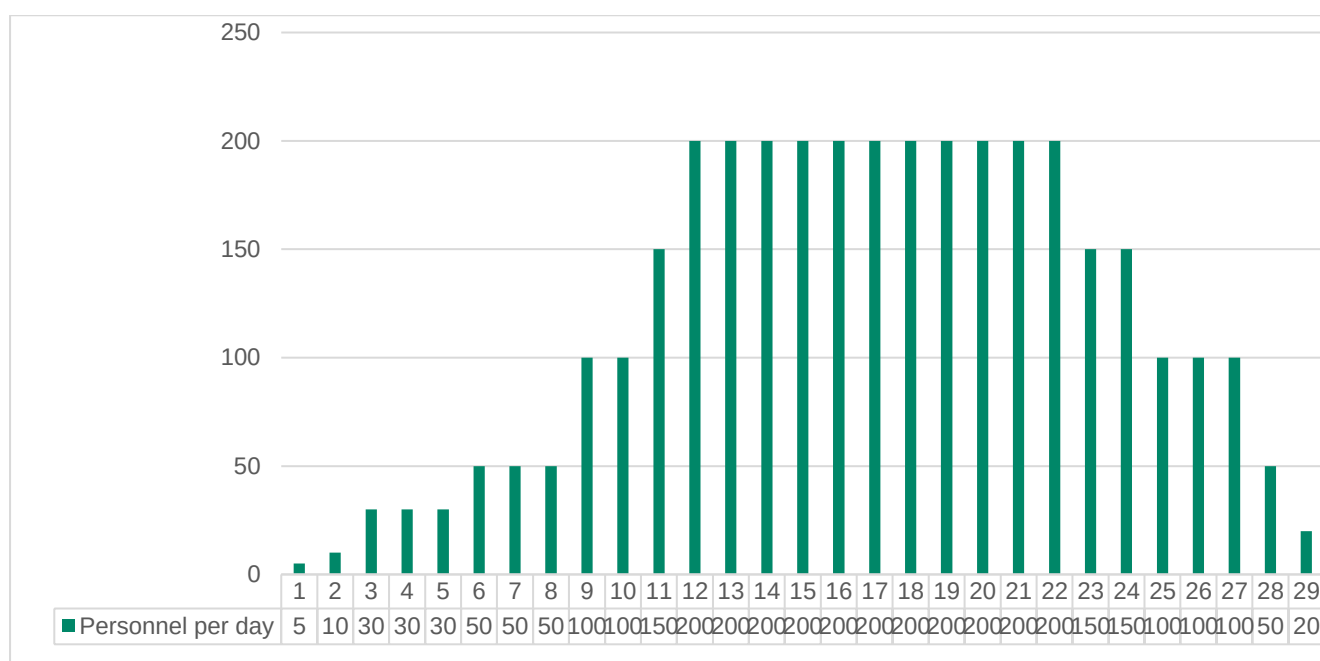


Plate 15.5: Estimated Number of Construction Workers Required On-Site

15.5.1.4 Leakage

Leakage effects refer to the proportion of jobs within a study area that are filled by residents living outside the study area, *i.e.*, defined in this case as Co. Kerry and Co. Limerick combined, as Census data does not provide this information at the LEAs level.

Commuting data²⁵ shows that 70.4% of people who work within Co. Kerry or Co. Limerick also live in the region. Therefore, the demand-side self-containment of jobs in Co. Kerry and Co. Limerick is 84% and leakage is set at 29.6%. A 29.6% discount is therefore applied to the estimated 130 jobs created by the Proposed Development. Therefore, it is expected that 100 people from within Co. Kerry or Co. Limerick, and 30 people from outside Co. Kerry or Co. Limerick will benefit from the Proposed Development.

²⁵ CSO (2022). *Census 2016. Population Aged 5 Years and Over at Work, Usually Resident and Present in the State 2016*

15.5.1.5 Displacement

Displacement measures the extent to which the benefits of a project are offset by reductions of output or employment elsewhere. Any additional demand for labour cannot simply be treated as a net benefit - it removes workers from other posts and the net benefit is reduced to the extent that this occurs.

Overall, it is assumed that due to the flexibility of a typical construction workforce (*i.e.*, they quickly move from project to project), displacement effects are considered to be low. The *HCA Additionality Guide*²⁶ suggests 25% as a 'ready reckoner' for low levels of displacement (*i.e.*, there are expected to be some displacement effects, although only to a limited extent). Applying this level of displacement to the employment generated for the Proposed Development results in a net direct employment of 97.

15.5.1.6 Multiplier Effect

In addition to direct employment generated by the construction of the Proposed Development, it is expected that there will be an increase in local employment arising from indirect and induced effects of the construction activity. Temporary indirect jobs will be created in the supply chain to provide material, specialist labour, and construction services for the workforce whilst induced employment may also be created (associated with local expenditure as a result of those who derive incomes from the direct and indirect impacts of the Proposed Development). This is known as the multiplier effect.

The *HCA Additionality Guide* provides 'ready reckoner' composite multipliers (the combined effect of indirect and induced multipliers) to account for this. This is a best practice approach in the absence of specific information that might provide a defensible justification for another multiplier effect level being used, appropriate to the sectors concerned. For the study area, a medium multiplier effect of 1.1 has been considered appropriate due to the local nature of the study area. Applying this multiplier generates an additional 10 indirect and induced jobs.

Table 15.14 provides a summary of the net construction employment for the Proposed Development.

Table 15.14: Net Construction Employment

	Co. Kerry & Co. Limerick	Outside Co. Kerry & Co. Limerick	Total
Gross Direct Employment	100	30	130
Displacement	-25	-8	-33
Net Direct Employment	75	22	97
Indirect / Induced Employment	8	2	10
Total Net Employment	83	24	107

Based on the gross construction worker requirements in the construction schedule and the additionality factors outlined above, 107 net construction jobs would be generated as a result of the Proposed Development, of which around 83 are expected to be from within Co. Kerry and Co. Limerick.

Taking into account the size of the labour pool of construction workers in Co. Kerry and Co. Limerick (7,141 combined²⁷), the Proposed Development is assessed to have a Low impact on the employment

²⁶ HCA (2014).

²⁷ CSO (2022).

workforce in the study area during the construction phase. Considering the frequency, extent, duration, and probability of the impact, the significance of effect is assessed to be a Slight Positive.

15.5.1.7 Human Health

This section summarises the impact of the Proposed Development on human health and wellbeing, structured by health determinants as set out in the *London HUDU Rapid Health Impact Assessment Tool*.

Access to Open Space and Nature

As the Proposed Development will be constructed within the SSE Tarbert site, it does not include the demolition or provision of open and natural spaces. However, this assessment considers whether the traffic, air quality, and noise and vibration effects of the Proposed Development are likely to impact the character of open and natural spaces and whether they remain welcoming, safe, and accessible for all during the construction phase.

In regard to air emissions, the Proposed Development will not result in any significant change to the local air quality environment. In regard to noise creation during the construction phase, the predicted construction levels, is within the relevant BS 5228 Category A limits for weekdays and Saturday morning construction works. During the peak construction period (month 7), Noise Sensitive Receptors (NSR), NSR2 and NSR3 remain compliant, however at NSR1 the 65dB $L_{Aeq,T}$ threshold value is exceeded by 3dB. This increase will be managed by mitigation measures which will provide reductions in the order of 5dB to 10dB for the various measures.

At NSR1, the closest and therefore potentially most sensitive NSR, the worst-case predicted level of 68dBA is comparable to the $L_{Aeq,T}$ observed at the Site already, this means that activities contributing to the existing ambient sound levels in the area may be equally as prominent in the environment at NSR 1 as the proposed construction activity in the worst-case scenario.

On this basis No Significant Adverse effects are expected at any residential NSR locations with regards construction phase noise levels generated by on-site activities with exception of NSR 1 in the peak month (month 7), the impacts are assessed to be Not Significant, Short-Term and Reversible.

Traffic generation associated with the Proposed Development is expected to have a Temporary Negative effect, Slight in significance impact on the N67 and a Temporary effect with a Not Significant impact on the N67. However, the total proposed traffic flow is therefore comfortably within the maximum capacity of the roads.

Therefore, it is expected that the Proposed Development will not impact upon the ability to access and enjoy existing open and natural spaces within the study area and the existing provision of open and natural spaces is expected to remain welcoming, safe and accessible for all. Consequently, the impact of the Proposed Development on access to open space and nature as a determinant of human health and well-being during the construction phase is assessed to be Neutral (0) and will result in a Not Significant effect.

Access to Healthcare Services and Other Social Infrastructure

As the study area is predominantly rural with limited public transport available, local residents rely heavily on the local and regional road network to access healthcare services, workplaces, educational facilities and community facilities.

During the construction phase, HGV traffic, general delivery traffic and site operatives will all be required to travel to and from the Site. The construction phase traffic will travel to and from the study area via the N67 and the N69 National Roads.

The transport assessment finds that although construction activity will cause an increase in traffic, it will not lead to congestion. The low existing number of vehicles using these roads means that even with traffic increases these junctions do not become congested. Therefore, it is expected that there will be a limited effect on the ability of residents to access healthcare and social facilities in the study area. The potential health impact during construction related to access to healthcare services and other social infrastructure is therefore assessed to be Neutral (0) and will result in a Not Significant effect.

Air Quality, Noise, and Neighbourhood Amenity

The quality of the local environment can have a significant impact on physical and mental health. Pollution caused by traffic and commercial activity can result in poor air quality, noise nuisance and vibration. Poor air quality is linked to occurrences of chronic lung disease (chronic bronchitis or emphysema), heart conditions and asthma levels among children and young people. Noise pollution can have a detrimental impact on health resulting in sleep disturbance, cardiovascular and psycho-physiological effects. Good design and the separation of land uses can lessen noise impacts³.

An assessment of the impact of the Proposed Development on air quality is provided in Chapter 7 (Air Quality). The assessment finds that there is a Negligible to Low risk of dust impacts occurring during construction which could affect human health due to the limited number of receptors in close proximity to dust sources. The assessment identifies an appropriate level of mitigation that will be able to control impacts to the extent that any effect is not significant.

An assessment of noise generation caused by construction traffic is provided in Chapter 11 (Noise and Vibration). The assessment predicts that there will be a Minor impact (Not Significant) from traffic noise levels is expected during the construction phase, these impacts would be defined as Imperceptible and Temporary.

A Construction Environmental Management Plan (CEMP) has been prepared and will be further updated and expanded by the Contractor in accordance with any conditions of the grant of planning. The CEMP will also ensure no impact on any vector that would pose a significant risk to human health. Therefore, the impact of the Proposed Development on air quality, noise, and neighbourhood amenity as a determinant of human health and well-being is assessed to be Neutral (0) and will result in a Not Significant effect.

Climate Change

An assessment of the likely climate change effects arising from the construction activities of the Proposed Development is provided in Chapter 17 (Climate).

Construction is estimated to emit approximately 10,399 tonnes of greenhouse gases (GHG). Emissions from the construction of the Proposed Development contribute considerably less than 1% of any carbon budget over the construction period in comparison to Ireland's national carbon budgets.

However, increase in GHG emissions is expected as a result of the construction of the Proposed Development (Chapter 17 (Climate)), and therefore the impact of the Proposed Development in terms of climate change as a determinant of human health and well-being during construction is assessed to be Negative (-). This will result in a Not Significant effect.

15.5.2 Operational Phase

15.5.2.1 Land Use

As previously noted, the Proposed Development is located in a primarily rural area. The Site of the Proposed Development is currently brownfield and is managed by the Applicant.

There will be no requirement to purchase or to gain access to any other land not under the management of the Applicant for the operation of the Proposed Development. During the operational phase, the land use will change from a brownfield site to an industrial / power infrastructure development. The operational phase will have a Slight, Long-Term impact on land use. However, there will be no effects associated with land use ownership.

15.5.2.2 Severance

The operation of the Proposed Development will require staff to travel to and from the Site, however, it is expected that staff travelling to the Site already do so due to existing operations.

The operational phase of the Proposed Development will generate up to 20 LDV (Light Duty Vehicle) and 18 HDV (Heavy Duty Vehicles) for the delivery of HVO, arrival trips per day. This increase in vehicles on the road network is minimal and has been scoped out of the traffic and transport assessment (Chapter 14 (Traffic and Transport)). Therefore, it is unlikely that there will be any traffic congestion which may deter local residents from accessing workplaces, educational facilities, or community facilities. The Proposed Development is assessed to have no impact on severance between local residents in the study area and the facilities which they use during the operational phase.

15.5.2.3 Employment

During the operational phase, the Proposed Development will be operated, maintained, and managed by the Applicant's personnel during normal operation. The annual upkeep and outages of the plant will require outsourcing specialised workers which will constitute a Slight, Long-Term and Positive effect on employment.

15.5.2.4 Human Health

Access to Open Space and Nature

Similar to the construction phase, the Proposed Development will operate within the existing boundary of the SSE Tarbert site and will not require the demolition or provision of open and natural spaces.

It is also important to assess whether the Proposed Development physically constrains people from accessing open and natural spaces nearby. As noted in the severance assessment above, there will be

no impact on severance between local residents in the study area and the facilities which they use during the operational phase (including open spaces).

Therefore, in regard to impacts on the character of open and natural spaces and whether they remain welcoming, safe and accessible for all, there will be no significant noise, air quality or traffic effects likely to arise during the operational phase. The impact of the Proposed Development on access to open space and nature as a determinant of human health and well-being during the operational phase is assessed to be Neutral (0) and will result in a Not Significant effect.

Access to Healthcare Services and Other Social Infrastructure

During the operational phase, some additional staff will be required to travel to and from the Site. The very small number of additional trips expected (noted in the severance assessment), is not expected to lead to congestion, and it will not impact accessibility between local residents and the healthcare facilities and social infrastructure they use in the study area. The potential health impact during operation related to access to healthcare services and social infrastructure is therefore assessed to be Neutral (0) and will result in a Not Significant effect.

Air Quality, Noise and Neighbourhood Amenity

It is expected that the Proposed Development will not result in any significant change to the local air quality or noise environment during operation. Therefore, the impact of the Proposed Development on air quality, noise and neighbourhood amenity as a determinant of human health and well-being is assessed to be Neutral (0).

Climate Change

In light of Ireland's national climate objective to achieve net zero carbon by 2050, the GHG impact of the Proposed Development (construction and operational) have been reviewed in line with Ireland's current carbon budgets to 2035.

Assessing the significance of GHG emissions the Proposed Development is considered to be Minor Adverse, and therefore Not Significant when considering the ability of Ireland to achieve its stated net zero pathway.

When assessing the significance of the emissions associated with the Proposed Development it is important to consider the emissions that would arise in the case of a 'do-nothing' scenario where the Proposed Development does not go ahead. In this case, energy would need to be generated from an alternative source. For this assessment, the emissions associated with the energy output of the OCGT is compared to emissions from sourcing equivalent energy (630,00 MWh) from a diesel fuelled OCGT, a natural gas fuelled OCGT and the Irish electricity grid as of 2023. The efficiency of the OCGT turbine is assumed to be 39%. This comparison only considers the embodied and Well to Tank (WTT) emissions associated with each fuel source.

The Total Lifecycle GHGs from operating the Proposed Development over its (at least) 25-year life are estimated to be 1,533,021 tonnes of CO₂ or equivalent.

There is a clear link between climate change and health. An increase in GHG emissions as a result of the Proposed Development (Chapter 17 (Climate)), and therefore the impact of the Proposed Development in terms of climate change as a determinant of human health and well-being during

operation is assessed to be Negative (-), however Not Significant when considering the ability of Ireland to achieve its stated net zero pathway.

15.5.3 Decommissioning Phase

It is expected that decommissioning will take up to one year. The decommissioning of the Proposed Development will be subject to approvals from the relevant authorities including KCC and the EPA prior to any works commencing. Effects arising from the process of decommissioning of the Proposed Development are considered to be of a similar nature and duration to those arising from the construction phase and therefore have not been considered separately.

15.6 Mitigation Measures

A CEMP has been prepared as part of the planning application. In advance of work starting on-site, the appointed Contractor will as appropriate, expand and update the CEMP into a Contractor's CEMP to ensure that there are no impacts on any vector that would pose a risk to human health.

No additional mitigation measures related to Population and Human Health are proposed during the operation of the Proposed Development, however mitigation for air quality, noise and vibration, traffic and transport and climate, is discussed in Chapter 7 (Air Quality), Chapter 11 (Noise and Vibration), Chapter 14 (Traffic) and Chapter 17 (Climate).

No additional monitoring measures are proposed.

15.7 Cumulative Impacts

This section assesses the potential impacts of the Proposed Development in-combination with the potential impacts of other development schemes (referred to as 'cumulative schemes') within the surrounding area.

A desktop planning history search undertaken in October 2023 using the Co. Kerry, Co. Clare and Co. Limerick online Planning Systems and An Bord Pleanála noted a number of planning applications which could combine with the Proposed Development to create a cumulative impact upon population and human health (refer to EIAR Volume I Chapter 4).

Of relevance to potential significant cumulative effects on population and human health, the construction of a Temporary Emergency Generation project (Tarbert TEG), Planning Ref. EE08.315838 at the SSE Tarbert site has commenced and construction works are scheduled to be complete in advance of construction of the Proposed Development commencing. An application submitted by EirGrid for cabling works, Planning Ref. 23350 which is not yet determined (at the time this EIAR was written) is also within the SSE Tarbert site, the construction programme of when these works would commence are unknown but could potentially overlap with the construction phase of the Proposed Development.

The SSE Renewables Limited project (Planning Ref. 18392) for a battery storage facility within the SSE Tarbert site has a ten-year planning consent and will be constructed on the parcel of land currently being utilised for the TEG project. The TEG project is due to be decommissioned and dismantled in 2028/2029, meaning this battery storage facility could be progressed after the removal of the TEG plant components.

15.7.1 Land Use

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

15.7.2 Severance

The assessment of Severance is inherently cumulative as the traffic data assessment includes the change in traffic generated by other committed developments. Cumulative impacts are therefore included in the assessment of severance in Sections 15.5.1.2 and 15.5.2.2.

15.7.3 Employment

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

It is expected that there will be a Slight, Short-Term and Positive cumulative impact on construction related employment within the local area.

15.7.4 Human Health

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

The assessment of 'access to open space and nature' is based on assessments provided in Chapter 7 (Air Quality), Chapter 11 (Noise and Vibration), and Chapter 14 (Traffic and Transport). As noted in these chapters, there are no anticipated cumulative effects on access to open space and nature from a human health perspective.

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.

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

15.8 Do Nothing Scenario

The 'do nothing' scenario would not result in any significant changes to the baseline population and human health receptors.

15.9 Residual Impacts and Summary

As part of the assessment of impacts on population and human health, the overall classification and significance of each effect has been assessed across the study area. A summary of the potential effects on population and human health is identified in Table 15.15 and Table 15.16.

Table 15.15: Summary of Potential Effects on Population Receptors

Population Determinant	Sensitivity of Receptor	Nature of Effect / Geographic Scale	Magnitude of Impact	Initial Classification of Effect (with embedded mitigation)	Additional Mitigation	Residual Effect Classification and Significance
Construction						
Land use	N/A	N/A	N/A	No Impact	None	No Impact
Severance	N/A	Temporary / Local	Negligible	Imperceptible	None	Imperceptible
Employment	N/A	Temporary / Local	Low	Slight / Positive	None	Slight / Positive
Operation						
Land use	N/A	N/A	N/A	No Impact	None	No Impact
Severance	N/A	N/A	N/A	No Impact	None	No Impact
Employment	N/A	N/A	N/A	No Impact	None	No Impact

Table 15.16: Summary of Potential Effects on Human Health Receptors

Health Determinant	Potential Health Impact	Additional Mitigation	Residual Effect Classification
Construction			
Access to Open Space and Nature	Neutral (0)	None	Neutral (0) / Not Significant
Access to healthcare services and other social infrastructure	Neutral (0)	None	Neutral (0) / Not Significant
Air Quality, Noise and Neighbourhood Amenity	Neutral (0)	None	Neutral (0) / Not Significant
Climate Change	Negative (-)	None	Not Significant
Operation			
Access to Open Space and Nature	Neutral (0)	None	Neutral (0) / Not Significant
Access to healthcare services and other social infrastructure	Neutral (0)	None	Neutral (0) / Not Significant
Air Quality, Noise and Neighbourhood Amenity	Neutral (0)	None	Neutral (0) / Not Significant
Climate Change	Negative (-)	None	Not Significant

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SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 16 Material Assets

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November 2023

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Table of Contents

16.	Material Assets.....	16-1
16.1	Introduction	16-1
16.2	Legislation, Policy and Guidance	16-2
16.3	Methodology	16-2
16.4	Baseline Environment.....	16-5
16.5	Potential Impacts	16-9
16.6	Mitigation Measures	16-14
16.7	Residual Impacts	16-16
16.8	Cumulative Effects.....	16-16
16.9	Summary	16-16
16.10	References	16-18

Plates

Plate 16.1:	Surrounding Environs and the Site	16-6
Plate 16.2:	Site (red line boundary) and SSE Tarbert site (blue line) boundary	16-7

Tables

Table 16.1:	Quality of Effects	16-3
Table 16.2:	Sensitivity Criteria for Land Use	16-3
Table 16.3:	Sensitivity Criteria for Utilities.....	16-4
Table 16.4:	Magnitude of Impact and Description.....	16-4
Table 16.5:	Significance of Effects	16-5
Table 16.6:	Matrix for Determining Significance.....	16-5

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16. Material Assets

16.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) identifies the significant impacts of the Proposed Development on material assets (built services) during the construction and operational and decommissioning phases.

Material assets are resources that are valued and intrinsic to the Site and the surrounding area. Material assets can be described as “built services” (i.e., utility networks such as electricity, telecommunications, gas, water supply infrastructure and sewerage), “waste management” and “infrastructure” (roads and traffic)¹.

The 2022 EPA Guidelines state that:

In Directive 2011/92/EU this factor included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes transport infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils.

This chapter will consider the potential impact to built services as a result of the Proposed Development. The potential impact on the traffic and transport and waste will be assessed in Chapter 14 (Traffic and Transport) and Chapter 18 (Waste Management) respectively and as such are not considered in this chapter.

This chapter defines the study area; the methodology used for developing the baseline and impact assessment; provides a description of the baseline environment; and presents the findings of the impact assessment. The potential impacts associated with the Proposed Development, if any, are assessed with regard to the following proposed material assets:

- land use.
- gas and electricity supply.
- wastewater services (foul and surface water).
- water supply; and
- telecommunications.

Full details on the background and Site history are provided in Chapter 4 (Existing Site and Conditions), and details of the Proposed Development are provided in Chapter 5 (Description of the Proposed Development) and the Planning Statement submitted with this planning application.

¹https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf

16.2 Legislation, Policy and Guidance

The legislation and guidance applicable to the material assets assessment include:

- Kerry County Council (2022). *Kerry County Development Plan (CDP) 2022-2028 (Kerry CDP 2022-2028)*.
- 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').
- EPA (2022). *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* ('EPA 2022 Guidelines').
- European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018) ('EIA Regulations').

16.3 Methodology

There is no specific set of Environmental Impact Assessment (EIA) guidelines for the assessment of material assets. For this reason, the methodology used to assess the impact on built services is in accordance with best practice guidelines including:

- EPA (2022). *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*.
- IEMA (2020). *IEMA Guide to Materials and Waste in Environmental Impact Assessment*.

A desktop assessment of information provided by the Applicant and publicly available information was undertaken to determine the baseline existing land use and utility arrangements within the study area which could be impacted as a result of the Proposed Development.

16.3.1 Selection of Study Area

The study area includes the Site, and the site surrounding area in relation to land use and utilities network that could be impacted by the Proposed Development. Selection of the surrounding area included in the study was based on professional judgment of the chapter contributor.

As the Site lies within the administrative area of Kerry County Council (KCC.), it is therefore subject to the land use policies and objectives of the Kerry CDP 2022-2028.

16.3.2 Quality of Effects

Material Assets were assessed for sensitivity, magnitude, and significance to provide an appropriate and adequate assessment of how they could be impacted by the construction, operational and decommissioning phases of the Proposed Development. The characteristic of an impact relates to the quality, sensitivity and duration of the impact and are defined in accordance with the EPA Guidelines². Table 16.1 defines the quality of effects on the environment.

² EPA (2022). *Guidelines on the Information to be contained in Environmental Impacts Assessment Reports*.

Table 16.1: Quality of Effects

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

16.3.3 Determination of Sensitive Receptors

For the purpose of the assessment of “built services” in this chapter, as described in section 16.1, the sensitive receptors are regarded as the built services and infrastructure in the study area. Terminology used to describe the sensitivity of the receptor has been adopted from the *EPA Guidelines*³.

16.3.3.1 Land Use

The criteria for land use sensitivity are outlined in Table 16.2.

Table 16.2: Sensitivity Criteria for Land Use

Sensitivity	Description
High	- Private residential buildings, or land allocated for development of housing. - Buildings used for employment use, and land allocated for development of employment uses. - Regularly used community buildings which have no alternatives available nearby. - Designated public open spaces, or open spaces which attract users nationally e.g., national parks
Medium	- Land associated with private residential buildings e.g., gardens. - Community buildings which are regularly used or where there are only limited alternatives available in the local area. - Open spaces which span over a regional area and attract visitors from a regional catchment e.g., country parks, forests. - Public rights of way and other routes close to communities which are used for recreational or utility purposes, but for which alternative routes can be taken.
Low	- Community buildings which are infrequently used or where there are many alternatives available in the local area. - Open spaces which are used for informal recreation (e.g., dog walking), and where there are alternative open spaces available. - Locally used community land e.g., local parks and playing fields. - Property consisting of public road / private road and small plots of land.
Negligible	Derelict or unoccupied buildings.

16.3.3.2 Utilities Infrastructure

The criteria for the existing utilities infrastructure sensitivity are outlined in Table 16.3.

³ EPA (2022).

Table 16.3: Sensitivity Criteria for Utilities

Sensitivity	Description
Very High	• Very high importance and rarity, international scale and very limited potential for substitution.
High	• High importance and rarity, national scale and limited potential for substitution.
Medium	• High or medium importance and rarity, regional scale, limited potential for substitution.
Low	• Low or medium importance and rarity, local scale.
Negligible	• Very low importance and rarity, local scale.

16.3.4 Magnitude of an Impact and Significance

Descriptions and criteria for defining the magnitude of an impact outlined in Table 16.4.

Table 16.4: Magnitude of Impact and Description

Magnitude	Typical Criteria Descriptors
Major	• Loss of resource and / or quality and integrity of resource, severe damage to key characteristics, features or elements (Adverse). • Large scale or major improvement of resource quality; extensive restoration or enhancement major improvement of attribute quality (Positive).
Moderate	• Loss of resource, but not adversely affecting the integrity; partial loss of / damage to key characteristics, features or elements (Adverse). • Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Positive).
Minor	• Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements (Adverse). • Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some positive impact on attribute or a reduced risk of negative impact occurring (Positive).
Negligible	• Very minor loss or detrimental alteration to one or more characteristics, features or elements (Adverse). • Very minor benefit to or positive addition of one or more characteristics, features or elements (Positive).
No Change	• No loss or alteration of characteristics, features or elements, no observable impact in either direction.

Table 16.5 outlines the significance categories in which an impact arising from the Proposed Development could be categorised.

Table 16.5: Significance of Effects

Significance	Typical Descriptors of Effect
Very Large	Only adverse effects are normally assigned this level of significance. They represent key factors in the decision- making process. These effects are generally, but not exclusively, associated with sites or features of international, national, or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change in a site or feature of local importance may also enter this category.
Large	These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process.
Moderate	These beneficial or adverse effects may be important but are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a particular resource or receptor.
Slight	These beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process and are not important in enhancing the subsequent design of the project.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Table 16.6 shows how the interaction between sensitivity and magnitude results in the significance of an environmental effect.

Table 16.6: Matrix for Determining Significance

		Magnitude of Impact				
		No Change	Negligible	Minor	Moderate	Major
Sensitivity	Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral Slight	Neutral or Slight	Slight

The methodology used for evaluating impact levels and the terminology for describing the quality, significance, extent, probability, and duration of effects is as per the EPA Guidelines⁴. In summary, it involves combining a sensitivity of a receptor with a description of an impact on that receptor (its quality, type, frequency, duration, probability, and magnitude) to determine a significance of an effect.

16.4 Baseline Environment

This section provides a description of the relevant aspects of the baseline environment in relation to material assets.

⁴ EPA (2022). *Guidelines on the Information to be contained in Environmental Impacts Assessment Reports*.

16.4.1 Study Area

The study area is the Site, as well as the surrounding area (within 200m) in relation to land use and utility networks that could be impacted by the Proposed Development.

The Site is located within the SSE Tarbert boundary which occupies an area of approximately 42ha (X: 475237; Y: 5826671).

The Site is located in Tarbert, County Kerry (Co. Kerry), approximately 1.8km north of Tarbert. According to the 2016 Census⁶, the population of Tarbert in 2016 was 540 see Plate 16.1.



Plate 16.1: Surrounding Environs and the Site ⁵

16.4.2 Land Use, Ownership and Access

The Site (red line boundary) is approximately 15.18 hectares (ha) and lies entirely within the existing SSE Tarbert site with the majority under the management of the Applicant, refer to Plate 16.2.

The SSE Tarbert site is off the N67, a National Secondary Road in Tarbert, Co. Kerry. The Site is surrounded by electricity generating transmission and fuel storage infrastructure (some of which is outside of the Site but within the SSE Tarbert site). The Site will be accessed via the N67, from the southern and northern entrances, which also serve the existing SSE Tarbert site and the Tarbert-Killimer Ferry Terminal. The N67 connects the Site to the N69 Tralee / Limerick Road, located 1.8km south of the Site. The Site is zoned for 'Economic Development' (KCDP 9-25 Shannon Estuary) in the Kerry CDP 2022-2028.

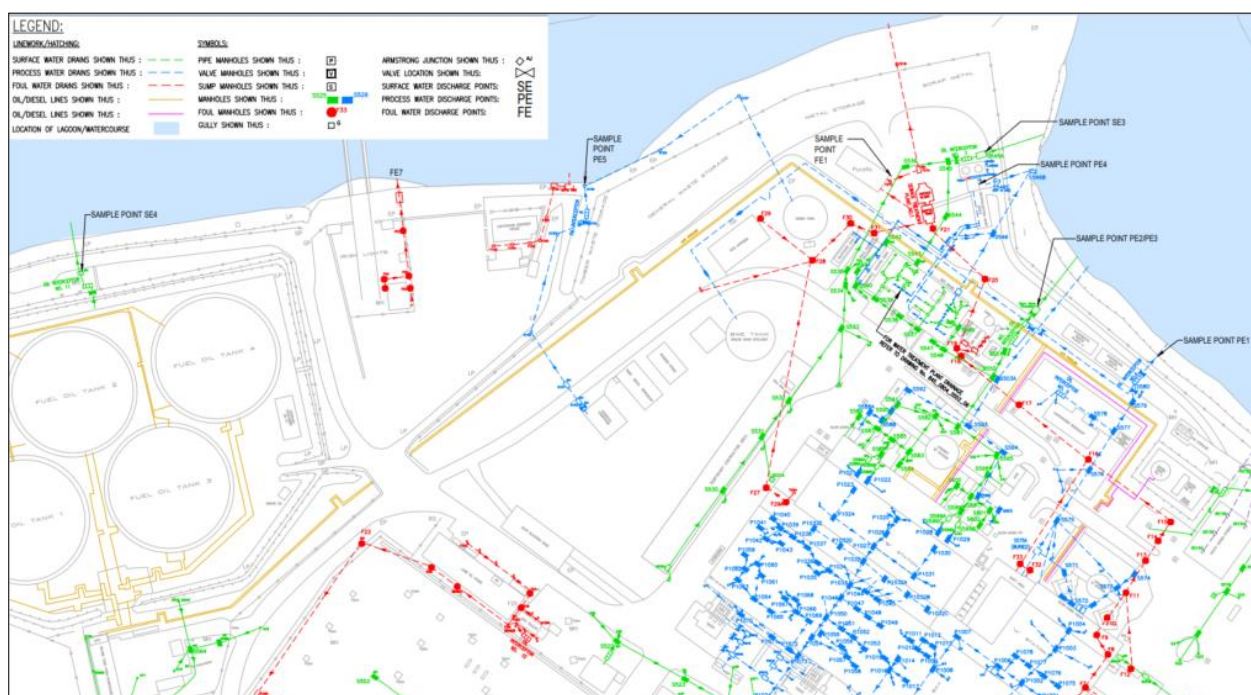
⁵ Source: Google Earth Pro - Annotations Added, website accessed in October 2023.



Plate 16.2: Site (red line boundary) and SSE Tarbert site (blue line) boundary ⁶

16.4.3 Utilities

As the Proposed Development Site is located within the boundary of the SSE Tarbert site, there are underground services and existing drainage networks which transverse the Site, that will need to be diverted during the construction phase. Refer to Plate 16.3.



⁶ Source: OpenStreetMap (2022). Annotations Added

Plate 16.3: Existing Underground Services⁷

16.4.3.1 Electricity Network

The electricity generating capacity of the existing Tarbert HFO Power Station is currently 620MW, consisting of four separate generating units, comprising:

- Two x 60MW oil-fired turbines.
- Two x 250MW oil-fired turbines.

In terms of existing electrical infrastructure, Tarbert HFO Power Station is connected to the national grid via a 220kV substation which is with the SSE Tarbert site (to the south of the proposed OCGT). Lower voltage supplies are available on the SSE Tarbert site from 110kV substation.

Within the SSE Tarbert site, the existing Tarbert HFO Power Station is connected to the ESB substation by overhead lines, where power from the Tarbert HFO Power Station is provided to the national electricity transmission grid. The ESB Substation is partially located within the Proposed Development Site with the entirety within SSE Tarbert site (blue line).

16.4.3.2 Wastewater Services (Surface and Foul Water)

The existing drainage / storm water system onsite collects all water from impervious surfaces (building roofs, hardstanding/ paved areas) and pipes it to an underground drainage system. Surface water/ storm water is discharged to the Shannon Estuary via nine emissions points. All runoff with the potential to become contaminated passes through oil interceptors to retain any hydrocarbons present. The surface water/ storm water emissions points are monitored quarterly.

Process water from the demineralisation plant of the Tarbert HFO Power Station is neutralised before being discharged to the Shannon Estuary, continuous monitoring of pH and flow is undertaken at these emission points alongside quarterly testing. Two foul sewage treatment units treat water on the SSE Tarbert site before discharging to the Shannon Estuary, the effluent from these is monitored quarterly.

Existing surface water outfall SE3 / outfall 9 and outfall 8 located adjacent to the Proposed Development Site will be utilised to enable disposal of surface water from the Proposed Development. All existing outfalls and drainage outlets have non-return flap valves or flood gates installed to prevent backflow during extreme events.

A foul water treatment network is present on the SSE Tarbert site. This consists of the following:

- Sewage Treatment Plant: No.1: Foul sewage from the Tarbert HFO Power Station is piped to the treatment plant, comprising a septic tank and a trickle filter located to the north of the existing Tarbert HFO Power Station and within the Proposed Development Site. This septic tank then discharges to Outfall 10.
- Sewage Treatment Plant No.2: This septic tank is within the SSE Tarbert site but outside of the Proposed Development Site. However, an existing toilet block located to the north of the 220Kv

⁷ SSE (2014) Extract from Drawing Ref: 845_0804_0003

substation which will be demolished connects to this sewage treatment plant which is located in the adjacent to the SSE Tarbert site and discharges to Outfall 24 into the lagoon.

16.4.3.3 Water Supply Network

There is an existing water supply which enters the SSE Tarbert site on the south-east boundary into the service reservoir positioned on the eastern boundary of the SSE Tarbert site. The reservoir provides the water feed for the entire SSE Tarbert site and will continue to do so for the Proposed Development.

16.4.3.4 Telecommunications

There are existing SSE Tarbert telecommunication lines for telephone and fibre services at the Tarbert HFO Power Station. There are underground carrier ducts existing within the SSE Tarbert site. No interference is expected to be encountered to telecommunications as the new stacks associated with the Proposed Development are of a smaller scale than the structures and stacks associated with the Tarbert HFO Power Station.

16.4.3.5 Other Utilities

Other utilities on the SSE Tarbert site include potable water supply.

16.5 Potential Impacts

This section contains an assessment of the potential impacts of the Proposed Development on 'built services'. The assessment takes description of the:

- 'Do nothing scenario' which assesses the relevant aspects of the current state against the likely evolution of the site without implementation of the Proposed Project.
- Evaluation of implementation of the construction, operational and decommissioning phases of the Proposed Project and description of the likely significant effects of the project on 'built services.'

The evaluation of effects on built services comprises a qualitative assessment based on the quantitative and qualitative analysis of potential effects on the environment undertaken in other chapters of this EIAR. The assessment also takes into account a review of relevant literature and professional judgement in relation to potential impacts on built services.

There is potential for disruption to existing materials assets on-site during the construction phase. Construction works are likely to take place over a period of 29 months. The construction phase will commence in Q2 2024 with the projected completion of the Proposed Development by Q4 2026.

16.5.1 Do Nothing Scenario

In the 'do nothing' scenario, the Proposed Development would not be constructed and the proposed operational activities at the site would not commence, and the status quo would remain as it is. There would be no impact with regard to the upgrade and / or connection of utilities proposed as part of the Proposed Development.

However, an alternative location/ project would be required to assist Ireland in process of transitioning from a centralised, fossil fuel-based electrical power generation model to a more distributed renewable-based generation system.

Under the 'do nothing' scenario and the development not being constructed the Applicant would be unable to generate electrical capacity from the Proposed Development, thus would reducing security of supply for Ireland. As the existing Tarbert HFO Power Station will no longer operate after December 2023 and generating will no longer generate electricity to the grid. The TEG Plant will remain being operational but only operating for maximum 500 hours per annum that being under used to its potential. This will have an impact on the security of electricity supply for the Country Ireland, increasing the potential risk of demand not being achieved.

16.5.2 Potential Impacts of the Proposed Development

Potential impacts evaluation of implementation of the construction, operational phases of the Proposed Project and description of the likely significant effects of the project on build services are described below.

Decommissioning phase effects are similar to the construction phase effects and it is considered in separate section.

16.5.2.1 Land Use, Ownership and Access

Construction Phase

The land use on the Site is industrial, as it is within the SSE Tarbert site. Therefore, there are no effects associated with the change of land use.

During the construction phase, construction traffic will use the existing SSE Tarbert entrances off the N67 and will function independently of both the existing Tarbert HFO Power Station and the TEG plant both of which are within the SSE Tarbert site, with TEG being outside of the Proposed Development Site boundary.

In terms of significance, there will be a **Negligible** sensitivity associated with the land use and access. Therefore, it is anticipated that the significance of impact without mitigation will be **Neutral**.

Operational Phase

The land use on the Site is industrial, as it is associated with SSE Tarbert. The Tarbert HFO Power Station will no longer operate after December 2023 and the TEG Plant will remain being operational. Therefore, there are no effects associated with the change of land use or access during the operational phase of the Proposed Development.

16.5.2.2 Utilities

Electricity Network

Construction Phase

During the construction phase, electricity will be required by the Contractor, and this will be provided to the construction areas and compounds, using diesel generators. A short-term connection outage may be required to facilitate this connection.

In terms of significance, facilitating the connection will be a **Low** sensitivity associated with the existing electricity network and supply. The magnitude of impact will be **Minor** as there will be a minor change in utilities required. As a result, for the existing electricity network, the significance of impact without mitigation will be **Not Significant / Slight**, and **short-term** in duration.

Operational Phase

As noted, power will be conveyed to the existing substation on the SSE Tarbert site (via overhead cabling).

The proposed new cabling route for the Site is designed and it will be constructed by SSE. The Tarbert HFO Power Station will no longer operate after December 2023 and the TEG Plant will remain being operational but only operating for maximum 500 hours per annum that being under used to its potential.

This will have an impact on the security of electricity supply increasing the potential risk of demand not being achieved.

The existing grid infrastructure has a **Low** sensitivity as the substation already exists and only an additional connection is required. The magnitude of impact will be **Moderate** as there will be additional power generation created (350MW) as a result of the Proposed Development. The significance of impact without mitigation will be **Slight** and **Positive**, and **Long-Term** in duration.

Wastewater Services (Surface, Foul and Process Water)

Construction Phase

During the construction phase, the following potential surface water impacts may occur:

- sedimentation of surface water features from construction works.
- pollution of surface waters from accidental spills and leaks of fuels and chemicals.

Various construction activities have the potential to release sediment and cause unacceptable sediment levels in the catchment area. Site stripping and bulk earthworks would leave deposits exposed to temporary erosion by wind and / or rain. This has the potential to lead to temporary increases in sediment loading of the surface water network. Contamination from suspended sediments may also be caused by run-off from material stockpiles.

Run-off containing large amounts of suspended solids could potentially adversely impact on surface water. The impact is considered a direct effect of a **Negative** nature and **Temporary** duration given it is only associated with the construction phase. Run-off containing large amounts of suspended solids is considered unlikely (with implementation of mitigating measures) to occur and should it occur, is likely to be **Temporary**.

During the construction phase, there is a risk of accidental pollution incidences from the following sources:

- spillage or leakage of oils and fuels stored on-site.
- spillage of oil or fuel from refuelling machinery on-site.
- spillage or leakage of oils and fuels from construction machinery or Site vehicles; and
- the use of wet concrete and cement
- spillage from portable sanitary facilities.

The SSE Tarbert site is currently serviced by an existing surface water drainage network. During the construction phase this existing drainage system (outfall SE3, Outfall 8 and Outfall 9) located adjacent

to the Site will be upgraded as part of the Proposed Development to allow additional surface water disposal from the Site which will be required as a result of the increase in impermeable surface area.

In terms of significance, there will be a **Medium** sensitivity associated with the surface water environment. The magnitude of impact will be **Moderate** and the significance of impact without mitigation will be **Moderate**, and **Short-Term** in duration. Refer to EIAR Volume I Chapter 12 (Water Environment) for further details on surface water.

During the construction phase foul water arising from welfare facilities within the Construction Compound, be collected and periodically removed from the Site by road tanker to a licensed water treatment plant. As this control measure will be incorporated into the Site set-up, additional specific mitigation measures are therefore not required to address foul sewage during the construction phase and are not discussed further.

Operational Phase

During the operational phase, surface water run-off will be generated from all hard surfaces within the Site which are exposed to rainwater or to which water is applied during wash down. This will include all hardstanding surfaces, roofs, and other impermeable surfaces. As noted previously, surface water is collected by means of the underground drainage network and will pass through an oil separator and oil interceptor prior to being discharged to the Shannon Estuary in accordance with best available techniques.

Surface water will drain at a controlled rate to the existing surface water network and discharge at SE3/ Outfall 8 and 9. The proposed drainage layouts are presented in Appendix 12B (refer to EIAR Volume II) submitted with this application.

There is a potential for increases in volume and rate of surface water run-off from new impervious areas, leading to an impact on flood risk, upstream and downstream of the Site.

Impacts on receiving waterbodies from anthropogenic pollutants in surface water run-off (including accidental fuel spillages from the proposed tanks and pipelines) are not anticipated, based on the embedded design measures, including bunding of fuel tanks and inclusion of interceptors within the drainage system. As a result, the significance of impact will be **Imperceptible**.

The proposed production of demineralised water Production of demineralised water will result in process wastewater which will be discharged to the surface water drainage system. The wastewater will contain the naturally occurring minerals removed from the mains water. Wastewater will be treated to adjust the pH to neutral range before discharge. This discharge will be controlled so it does not give rise to significant effects.

HVO contains low levels of impurities which are removed prior to use in the OCGT by means of a fuel polishing system. Waste generated by the fuel polishing system will be stored in a tank. The waste from the tank will contain hydrocarbons and will periodically be disposed offsite by road tanker in compliance with the Waste Management Act 1996, and associated regulations.

The internal blading of the gas turbine accumulates deposits from the air over time which requires periodic washing. The frequency of washing is a function of operating hours and ambient air characteristics. The turbine is rotated slowly in a water and detergent solution. Wastewater generated

from blade washing will be collected in a dedicated drain tank for disposal offsite by road tanker in compliance with the Waste Management Act 1996, and associated regulations for disposal.

The Tarbert HFO Power Station will no longer operate after December 2023 and the TEG Plant will remain being operational but only operating for maximum 500 hours per annum that being under used to its potential. Impacts on receiving waterbodies from anthropogenic pollutants in relation to the operational phase will be similar to the future scenario without the Proposed Development. As a result, the significance of impact will be **Imperceptible**.

16.5.2.3 Water Supply Network

Construction Phase

During the construction phase water supply for construction works will be provided by means of the existing Irish Water mains water connections on-site which feed into the on-site reservoir and also into the existing Tarbert HFO Power Station. The Contractor will submit a pre-connection application to Irish Water for this temporary connection. As a result, there is potential for a **Temporary** impact to the existing mains water connection on-site, by way of temporary (during installation) disruption in water supply to SSE Tarbert if additional connections points need to be obtained.

In terms of significance, there will be a **Low** sensitivity associated with the existing water supply network at SSE Tarbert. The magnitude of impact will be **Negligible** and the significance of impact without mitigation will be **Not Significant / Slight**, and **Temporary** in duration.

Operational Phase

During the operational phase, water will be supplied to the Site via the existing Irish Water mains water connection that feeds the reservoir, the existing connection is sufficient to provide quantities needed during operational phase.

During the operational phase, water will also be used welfare facilities and if required for firefighting purposes and NOx Control. Water supply to the firewater storage tank will be from an existing Irish Water connection, with a storage tank of approximately 5900m³.

Fire water discharges will be collected in the surface drainage system and will be tested before being discharged from the Site after passing through the drainage interceptors.

In terms of significance, there will be a **Low** sensitivity associated with the existing water supply network. The magnitude of impact will be **Low** as there will be less demand on the existing water network. As a result, for the existing water network, the significance of impact without mitigation will be **Low**, and **Long-Term** in duration.

Telecommunications

Construction Phase

During the construction phase, communications supply to the proposed OCGT will be laid. Power and communications supply to proposed OCGT will be provided by buried cables.

Existing telecommunications infrastructure will be utilised during the construction phase, where necessary the construction contractors will provide their own connections.

A short-term connection outage may be required to facilitate this connection. In terms of significance, there will be a **Low** sensitivity associated with the existing telecommunications infrastructure. The magnitude of impact will be **Negligible** and the significance of impact without mitigation will be **Not Significant / Slight**, and **Temporary** in duration.

Operational Phase

During the operational phase the Proposed Development will connect to the existing telecommunications infrastructure on the SSE Tarbert site, which will result in a marginal increase in demand in comparison to future scenario of the Tarbert HFO Power Station no longer operating after December 2023 and the TEG Plant remaining operational.

The location of the site and Proposed Development infrastructure will not have the potential to impact on telecommunication signals due to its remote location and the development will not produce electromagnetic shadow volume.

In terms of significance there will be a **Low** sensitivity associated with the existing telecommunications infrastructure. The magnitude of impact will be **Negligible**.

16.5.3 Decommissioning Phase

A Decommissioning Plan (which will include a Decommissioning Environmental Management Plan (DEMP)) will be prepared and agreed with the EPA as part of the permit surrender process. The DEMP will consider the potential environmental risks at the Site and provide guidance and appropriate mitigation procedures as necessary, to minimise risk.

Where decommissioning takes place, all above-ground equipment associated with the Proposed Development will be disassembled and removed from the Site. However, prior to the removal of equipment, all residues and operating chemicals will be cleaned out from the plant and disposed of at a suitably licenced facility. The majority of the plant and equipment will have some limited residual value as scrap or recyclable materials and will be recycled at the time.

It is expected that decommissioning will take up to one year. Effects arising from the process of decommissioning of the Proposed Development are considered to be of a similar nature and duration to those arising from the construction phase and are therefore have not been considered separately. Refer to EIAR Volume I Chapter 5 (Description of the Proposed Development).

16.6 Mitigation Measures

Construction phase mitigation measures include avoidance, reduction, and remedy measures to reduce or eliminate any significant adverse impacts identified.

16.6.1 Construction Phase

16.6.1.1 Construction Environmental Management Plan (CEMP)

An CEMP has been prepared as part of this planning application (refer to Appendix 5A, EIAR Volume II). The CEMP will be further refined and expanded by the appointed Contractor following the grant of planning permission.

The CEMP will detail the Contractor's overall management and administration of the works and in agreement with the planning authority in accordance with CEMP submitted with this planning application. The CEMP will also include any commitments included within the statutory approvals. The CEMP will be treated as a live document throughout the lifecycle of the Proposed Development, requiring regular review and update as necessary.

16.6.1.2 General Mitigation Measures

The following best practice measures will be implemented by the appointed Contractor during the construction phase:

- Works during the construction phase, including service diversions and realignment will be carried out in accordance with relevant guidance documents, including the ESB's *Code of Practice for Avoiding Danger from Overhead Electricity Lines*, and the Health and Safety Authorities (HAS, 2019) *'Code of Practice for Avoiding Danger from Underground Services'*.
- Works during the construction phase will be carried out in accordance with SSE's Safe Systems of Work (SSOW).
- The appointed Contractor will be obliged to put measures in place during the construction phase to ensure that there are no interruptions to existing services and all services and utilities are maintained unless this has been agreed in advance with the relevant service provider and local authority. When service suspensions are required during the construction phase, reasonable prior notice will be given to the residents in the area. The disruption to services or outages will be carefully planned so the duration is minimised. The timing of local domestic connections will be addressed between the Contractor and the local community at the detailed design stage.

16.6.1.3 Land Use

No mitigation or monitoring measures have been proposed for land use.

16.6.1.4 Wastewater Services (Surface and Foul Water)

Surface water mitigation measures are outlined in EIAR Volume I Chapter 12 (Water Environment), and therefore are not repeated here.

16.6.2 Operational Phase

There will be no requirement for additional mitigation measures during the operational phase.

However, routine maintenance will be carried out in accordance with the maintenance procedures provided by the contractor and manufacturer.

These works will generally take place during the summer months, when demand for the Proposed Development is at its lowest. Also, during this period maintenance on balance of plant will also be undertaken.

Process wastewater during the operational phase will be regulated and monitored under the IE Licence.

16.7 Residual Impacts

All material assets after mitigation will have a **Neutral** or **Not Significant** residual effect once mitigation measure including those within the CEMP are taken into account.

16.8 Cumulative Effects

Cumulative effects are defined as "the combination of many minor impacts creating one, larger, more significant effect" (Table 3.4 Descriptions of the effects, EPA 2022)⁸. Cumulative effects consider existing stresses on the natural environment as well as developments that are in construction, operation and proposed pre-planning.

A search of planning applications within 5km of the Site is presented in Chapter 4, EIAR Volume I. The 5km search area was used due to the rural nature of the area and the existing sparse development, other known developments with the possibility of having cumulative effects with the Proposed Development.

The applications of note for the cumulative effects are:

- Designated Development of three x 50MW OCGT generating plant (Tarbert TEG) (Planning refs. ABP-315838-23).
- Works within Tarbert Generating Station to the 220kV switchgear within the existing Tarbert substation compound including removed of an existing cable joint (Planning ref.: 23350).

There is the potential for cumulative effects associated with further temporary disruptions to existing utilities in the local area and increased demands on existing utilities if these developments are constructed at the same time as the Proposed Development. There is also a potential for cumulative effects associated with accidental spills and leaks and the use of concrete and lime (to the surface water network) and potential impact on ecological receptors.

Potential disruptions to existing utilities will be Slight or Moderate given the position of projects within the SSE Tarbert site to one another. It is not unreasonable to assume that the committed developments, 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 **Negligible**.

16.9 Summary

It is concluded that the residual effects on material assets will be **Neutral** or **Not Significant** once mitigation measures including those within the CEMP are taken into account.

There is a potential for cumulative effects associated with further temporary disruptions to existing utilities and increased demands on existing utilities. However, providing standard best practice control measures are implemented as required on all sites, the cumulative impact will be **Not Significant**.

⁸ Guidelines on the information to be contained in Environmental Impact Assessment, EPA (2022).

There will be no requirement for additional mitigation measures during the operational phase. However, routine annual maintenance will be carried out in accordance with the maintenance procedures provided by the Contractor and manufacturer.

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SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 17 Climate

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Table of Contents

17.	Climate	17-1
17.1	Introduction	17-1
17.2	Legislation, Policy and Guidance	17-2
17.3	Methodology	17-6
17.4	Baseline and Projected Environment	17-15
17.5	Potential Impacts	17-19
17.6	Residual Impacts	17-21
17.7	Cumulative Effects	17-28
17.8	Summary	17-29
17.9	References	17-30

Plates

Plate 17.1: Annual Global Historical Temperature with Projected Annual Global Carbon Emissions (left) and Projected Global Temperatures (right)..... 17-5

Plate 17.2: Comparative use and WTT emissions factors of Diesel and HVO fuels. Emissions factors sourced from *DESNZ (2023), 'GHG emissions factors for company reporting'* 17-25

Tables

Table 17.1: Proposed Carbon Budgets for Ireland.....	17-3
Table 17.2: Level of consequence definitions	17-8
Table 17.3: Climate hazard occurrence likelihood descriptors.....	17-9
Table 17.4: Climate impact occurrence likelihood descriptors	17-9
Table 17.5: Level of consequence definitions	17-10
Table 17.6: Risk Matrix	17-10
Table 17.7: Potential Sources of GHG Emissions	17-12
Table 17.8: Significance of Effects for GHG Impact Assessment	17-14
Table 17.9: Key Message - Climate Change Projections Ireland.....	17-16
Table 17.10: Climate Change Baseline and Projection Data	17-17
Table 17.11: Climate Variables Definition	17-18
Table 17.12: Initial CCRA Risk Rating	17-19
Table 17.13: Embedded Controls.....	17-20
Table 17.14: Adaptation Measures Identified	17-21
Table 17.15: Residual Risk Profile	17-22
Table 17.16: Construction Phase GHG Emissions	17-23
Table 17.17: Construction GHG Emissions.....	17-23

Table 17.18: Operational GHG Emissions	17-24
Table 17.19: GHG impacts during decommissioning phase.	17-26
Table 17.20: GHG Emissions and Ireland's Carbon Budgets	17-27
Table 17.21: GHG Emissions and Ireland's Electricity Sectoral Carbon Budget	17-27
Table 17.22: Energy Alternatives Analysis	17-28

Appendices (EIAR Volume II)

Appendix 17A: CCRA Risk Assessment

Figures (EIAR Volume III)

No Figures

17. Climate

17.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) considers the impact of the Proposed Development on the climate as a result of greenhouse gas emissions that may arise during the construction, operation and decommissioning phases. This chapter also considers the impact of climate change on the Proposed Development.

Full details on the background and Site history are provided in EIAR Volume I Chapter 4 (Existing Site and Conditions), and details of the Proposed Development are provided in Chapter 5 (Description of the Proposed Development) and the Planning Statement submitted with the planning application.

17.1.1 Purpose and Scope

The assessment of climate impacts can be divided into two categories as required by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018) and in line with the Institute of Environmental Management and Assessment (IEMA) guidance for climate change mitigation and adaptation (2020), and guide to assessing greenhouse gas emissions and evaluating their significance (2022).

- **Lifecycle Greenhouse Gas (GHG) Assessment:** assessment of the impact of GHG emissions, arising over the life of the Proposed Development, on the climate.
- **Climate Change Resilience (CCR):** assessment of the vulnerability and resilience of the Proposed Development to the projected impacts of climate change.

17.1.2 Assumptions and Limitations

The assessments presented in this chapter are subject to the following assumptions and limitations:

- Due to the nature of GHG emissions i.e., they are not geographically constrained and the receptor being the global climate, a quantitative assessment of cumulative GHG effects is not appropriate. Consequently, consideration of effects on the climate of GHG emissions from the Proposed Development together with other arbitrarily selected developments is not considered to be applicable.
- There are inherent uncertainties associated with climate change projections, as detailed in Section 17.2.6. To overcome these, current climate change data and science has been incorporated into the assessment and proven effective approaches undertaken to assess similar project types have been replicated.
- Further assumptions specific to the GHG and CCR assessments are detailed in their respective sections.

17.2 Legislation, Policy, and Guidance

This section identifies and briefly describes the legislation, policy, and guidance of relevance to the assessment of potential impacts associated with the construction, operation and decommissioning of the Proposed Development on the climate and impacts of climate change on the Proposed Development.

17.2.1 International Legislation, Policy, and Guidance

EIA Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment (amended): An EU Directive on the assessment of the effects of certain public and private projects on the environment. Annex IV specifically requires that EIAs require information to be included on *'the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change'*.

Kyoto Protocol: An international agreement linked to the United Nations Framework Convention on Climate Change (UNFCCC), which commits its Parties by setting internationally binding emission reduction targets. The current Effort Sharing Decision (ESD) commits Ireland to a 39% reduction in GHG emissions for the period 2021 to 2030.

Paris Agreement: (Conference of the Parties No. 21, 2016): A legally binding agreement within the UN framework convention on climate change which requires all signatories to strengthen their climate change mitigation efforts to keep global warming to below 2°C this century.

EU Emissions Trading System: (Directive 2003/87/EC (as amended)): This directive of 13 October 2003 established a scheme for GHG emission allowance trading within the Community and amending Council Directive 96/61/EC. The EU's current binding target for 2030 is to cut GHG emissions by at least 40% below 1990 levels. This target is split across the EU Emissions Trading System (ETS) and non-ETS sectors. The ETS is a 'cap and trade' system where an EU-wide limit, or cap, is set for the overall volume of GHG that can be emitted by power plants, industry factories and the aviation sector. The cap is reduced over time so that total emissions fall. It covers about 45% of EU emissions, but only about 29% of total emissions in Ireland. Since 2021, the overall European emissions cap has reduced by an annual rate of at least 2.2%.

European Green Deal: Policy initiatives by the European Commission aiming to improve the quality of life in the EU by making Europe GHG neutral by 2050. Under the European Green Deal a series of ambitious packages have been launched to make the EU's climate, energy, land use, transport and taxation policies fit for reducing net GHG emissions. Amongst these initiatives are the EU Strategy on Climate Adaptation and the EU Taxonomy for sustainable activities.

EU Renewable Energy Directive (RED-II): Directive 2018/2001 (recast) on the promotion of the use of energy from renewable sources. On 14 July 2021, the European Commission proposed the revision of the RED II under the "Fit for 55" package of legislative proposals, in view to achieve climate neutrality in the EU by 2050, including the intermediate target of a 55% net reduction in greenhouse gas emissions by 2030. SSE is committed to sourcing HVO that is third-party certified to RED II standards under the

International Sustainability and Carbon Certification (ISCC). This stipulates that HVO will be sourced from 100% waste feedstocks, the raw materials for which are grown on a seasonal basis so there is no long-term 'carbon debt'. Supplied HVO will comply with the RED II (Directive (EU) 2018/2001) which provides specific sustainability criteria and the carbon intensity of individual biofuels, including an assessment of the feedstocks used and the emissions from its production, processing, and supply, and will be certified accordingly by a third party. There is an existing HVO supply chain and infrastructure in Ireland which the Proposed Development will utilise.

17.2.2 National Legislation, Policy and Guidance

S.I. No. 93 of 1999: European Communities (Environmental Impact Assessment) (Amendment) Regulation, 1999. Article 25 (2) (b) of this Regulation specifically requires an environmental impact statement to contain: '*a description of the aspects of the environment likely to be significantly affected by the proposed development, including in particular...climatic factors*'.

Climate Action and Low Carbon Development (Amendment) Act 2021: This Act commits Ireland to move to a climate resilient and climate neutral economy by 2050. The Act brings in a requirement for five-year carbon budgets to commence in 2021, the first two budgets demonstrating a 51% reduction against a 2018 baseline by 2030.

Sectoral Emissions Ceilings 2022: To further support carbon budget targets, in 2022 the government set sectoral emissions ceilings for electricity, transport, the built environment, industry, agriculture, and land use change. For the electricity sector, a ceiling of 3MtCO₂e has been set for 2030, equating to a 75% reduction in emissions against 2018 levels.

Climate Action Plan 2023: This updated Plan provides a detailed plan to achieve a 51% reduction in GHG emissions by 2030, compared to 2018 levels, and achieve net zero emissions by no later than 2050. The Climate Action Plan was published December 2022 and sets out of the roadmap for achieving Ireland's carbon budgets and reaching net zero by 2050. The carbon budgets, proposed by the Climate Change Advisory Council, were adopted 6th April 2022, and are outlined in Table 17.1. Key measures to support these targets include an accelerated transition towards renewable energy, supported by a minimum of 2GW of new flexible gas-fired power generation for quick response power generation.

Table 17.1: Proposed Carbon Budgets for Ireland

	<u>2021-2025</u>	<u>2026-2030</u>	<u>2031-2035</u>
Carbon Budget (Mt CO₂e)	295	200	151
Electricity Sectoral Budget (Mt CO₂e)	40	20	N/A

National Energy and Climate Plan (NECP) 2021-2030: The 2020 NECP incorporates all planned energy and climate policies and measures identified up to the end of 2019. The Plan has been created in part to support the EU's 2050 net zero target and strategy to develop an energy union to provide EU consumers secure, sustainable, competitive, and affordable energy through the five dimensions. The five dimensions include:

- Security, solidarity, and trust.
- A full integrated internal energy market.
- Energy efficiency.
- Climate action, decarbonising the economy.
- Research, innovation and competitiveness.

White Paper Ireland's Transition to a Low Carbon Energy Future 2015-2030: This white paper confirms the need to enhance energy security and to provide a reliable supply of gas to meet demand as part of a sustainable energy transition to a low carbon future.

National Adaptation Framework (NAF): Prepared under the Climate Action and Low Carbon Development Act 2015, the NAF was launched in January 2018 setting out the national strategy to reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts.

17.2.3 Local Policy

Kerry County Development Plan 2022-2028: The Kerry County Development Plan 2022-2028 incorporates aims, objectives, policies, and guidelines to provide for the proper planning and sustainable development of County Kerry (Co. Kerry). This plan details the importance of the development of energy infrastructure within Co. Kerry and outlines the Council's intention to *'support and provide for the sustainable development of indigenous energy resources, with an emphasis on renewable energy supplies, in the interests of economic progress and the proper planning and sustainable development of the county.'*

Kerry County Council Climate Change Adaption Strategy 2019-2024: This strategy sets out a framework of actions and measures that Kerry County Council (KCC) proposes to undertake to further embed climate adaptation into all of the local authority's areas of responsibility and to assist communities in adapting to climate change. It outlines the goal to increase capacity for climate resilient infrastructure, centred around the effective management of climate risk, informed investment decisions and positive contribution towards a low carbon society.

17.2.4 Client Policy

SSE Net Zero Acceleration Policy: SSE's commitment to net-zero targets have led to a pledge to invest £18bn in low-carbon energy and electricity infrastructure by the end of March 2027. SSE also targets net zero GHG emissions across its scope one and scope two emissions by 2040 and for remaining scope three emissions by 2050. Additionally, SSE aims to increase its renewable energy output fivefold by 2031.

17.2.5 Climate Context

The Intergovernmental Panel on Climate Change (IPCC) has confirmed in its Assessment Reports that the anthropogenic influence on the climate system is clear and growing with impacts observed across all continents and oceans. The concentration of CO₂ in our atmosphere has significantly increased due

to human activities, with observed levels of global atmospheric CO₂ rising from their pre-industrial levels of 280 parts per million (ppm) up to 417.81ppm as of April 2022. Given CO₂ is a GHG that absorbs and radiates heat, these increases have resulted in the warming of Earth's atmosphere. According to an ongoing temperature analysis by NASA, the average global temperature on Earth has increased by at least 1.1°C since 1880, with the rate of warming since 1981 at roughly 0.18°C per decade.

The IPCC's Fifth Assessment Report (AR5) (2014) developed Representative Concentration Pathways (RCPs) to aid understanding of how the global climate may change in the future. RCPs describe four different 21st Century pathways of GHG emissions depending on the level of mitigation action undertaken between now and then. They are based on global research and existing literature and comprise a stringent mitigation pathway (RCP2.6), two intermediate scenarios (RCP4.5 and RCP6.0) and a high emissions scenario (RCP8.5) shows the emission trajectories and projected global temperatures up to 2100 in terms of the IPCC's RCPs.

These emission pathways are used for developing climate change projections which can then be used by policymakers, scientists, and other professionals to estimate and plan for climate risks and impacts.

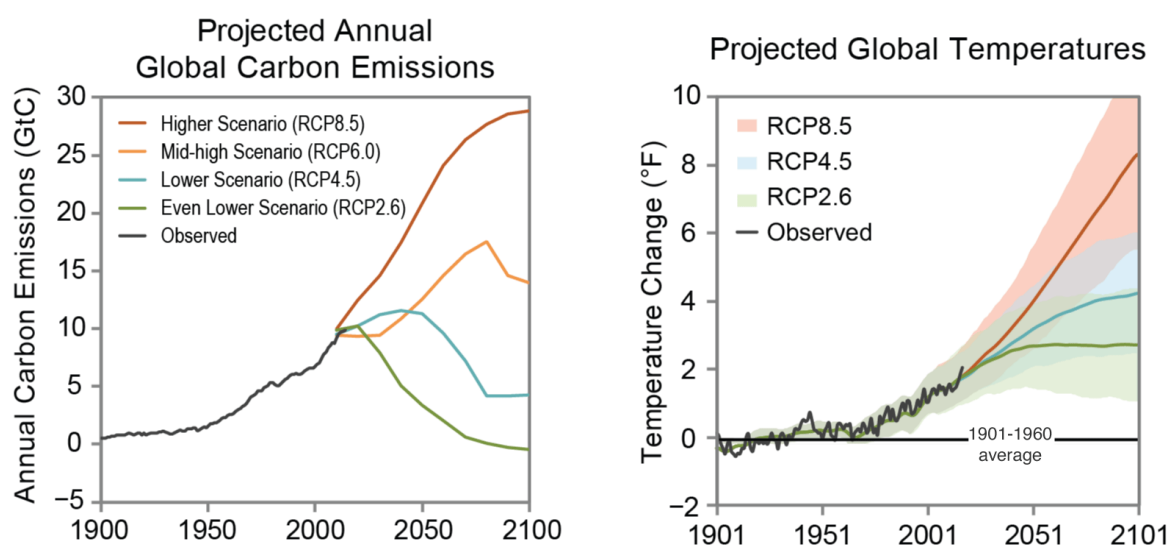


Plate 17.1: Annual Global Historical Temperature with Projected Annual Global Carbon Emissions (left) and Projected Global Temperatures (right)

17.2.6 Climate Change Uncertainty

Climate change projections introduce inherent uncertainty as a result of limitations associated with available measurements and challenges in evaluating causation in complex and multi-component processes. Uncertainty in climate change projections is derived from multiple sources including:

- Uncertainty in how GHG emissions will change overtime due to key unknowns in the drivers of this change. Such drivers include economic and population growth, lifestyle, and behavioural changes, associated changes in energy use and land use, technology, and climate policy.
- Variable confidence levels in how well the climate models predict different climate variables. For example, climate models perform less well in their simulation of large-scale precipitation

patterns than for surface temperature. The certainty in the IPCC's key assessment findings is expressed as a qualitative level of confidence (from *very low* to *very high*).

Such reasons highlight the importance to use a range of projection scenarios when considering how climate may change in the future, and to allow for the participants in the risk assessment process and the ultimate user of the risk assessment outcomes to be cognisant of the inherent uncertainty.

17.3 Methodology

17.3.1 Climate Change Risk Assessment

The methodology in this chapter has been developed in line with appropriate industry guidance for assessing climate change resilience and adaptation such as IEMA's EIA Guide to Climate Change Resilience and Adaptation and in accordance with the EU Commission Notice (2021/C 373/01) Technical guidance on the climate proofing of infrastructure in the period 2021-2027.

The assessment includes all infrastructure and assets associated with the Proposed Development. It assesses the resilience against both gradual climate change i.e., chronic climate-related hazards and the risks associated with an increased frequency of severe weather events i.e., acute events.

17.3.1.1 Asset Components

When conducting a robust climate change risk and adaptation assessment, it is important to understand the individual components that make up the asset as each may be vulnerable to different climate variables in different ways. The key asset components that have been considered in this climate assessment include:

- Critical plant equipment e.g., stack, gas turbine.
- Mechanical and electrical services
- Administration building
- Workshop
- Associated Infrastructure
- Roads, pavements
- Drainage
- Construction assets (plant, equipment, and workers)
- Staff and visitors on-site

17.3.1.2 Climate Change Data Climate Variables

Given its location along the shoreline and the classification of the Proposed Development as a power station with ancillary buildings, the following chronic and acute variables were identified as relevant:

- **Temperature related:** changing air temperature, heat stress, temperature variability, frost days.

- **Wind-related:** changing wind patterns, storms.
- **Water-related:** changing precipitation patterns, sea level rise, drought, heavy precipitation, flood (including pluvial and coastal).

Climate Baseline Data

For the purposes of the CCR assessment, the baseline conditions are based upon historic climate change data. This data was obtained from Met Éireann, recorded by the closest meteorological station to the Site with the largest range of historical data and a similar geographic context (i.e., coastal, sea-level elevation). The closest meteorological station to the Site that fits the above criteria is Shannon Airport. Historic average data was collected for the climate variables described previously for the period 1981-2000. This baseline period was chosen because it matches the baseline period for the available climate change projections from Climate Ireland. The historical data collected is provided in Table 17.10.

Climate Change Projection Data

For this CCR assessment, two climate change scenarios were reviewed to provide decision-makers with a more holistic understanding of the range of potential climate futures possible, which is essential when understanding risk and developing appropriate adaptation measures. These climate change projections were based on RCP 4.5 and RCP 8.5.

RCP 4.5 is an intermediate scenario and represents a less steep decline in GHG emissions than the targets in RCP 2.6. It requires that CO₂ emissions start declining by 2045 and halve in value between 2050 and 2100. And decline to about 75% of the CH₄ levels of 2040. It also requires that SO₂ emissions decline to approximately 20% of those of 1980-1990.

RCP 8.5 was also used as it represents a worst-case scenario, which is useful in risk and contingency planning. This pathway has the highest emissions concentration and is marked by inadequate policy response and increased potential for physical asset damage.

The climate change projection data used was gathered from Climate Ireland's 'Climate Data Explorer' online platform. The data available on this platform is based on Nolan and Flanagan's 2020 Ensemble of regional climate model projections for Ireland. The Climate Data Explorer provides climate change projection data for a variety of climate variables for the period 2041-2060 (compared to a 1981-2000 baseline). Whilst it is best practice to consider climate change projections from multiple time horizons, 2041-2060 is the timeframe for which most supporting data was available. This period is relevant as it encompasses the entire planned design life of the Proposed Development. The climate change projection data collected is provided in Table 17.10.

Risk Assessment

Using the climate change projection data gathered in Table 17.10 a series of risks were identified for the climate hazards determined to be relevant to the Proposed Development. For each risk identified, the asset components impacted were noted and the planned or embedded controls identified. In this instance, embedded controls represent measures already included in the design and operation of the Proposed Development that work to mitigate climate risk. With this information, an initial assessment of

climate change risk was undertaken based on an analysis of likelihood and consequence. Adaptation measures were then subsequently identified to further reduce risk and increased resilience, after which a residual assessment of risk was performed. The full climate change risk register can be found in EIAR Volume II Appendix 17A. To represent a worst-case-scenario, the risk register only considers a RCP 8.5 climate change scenario.

This assessment was informed by the risk framework and the descriptors of likelihood and consequence adopted from EU Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027. The likelihood descriptors for climate hazards and impacts, and the definition of consequence are provided in Table 17.2 and Table 17.3.

Table 17.2: Level of consequence definitions

Level of consequence of climate impact Definition of Consequence

Catastrophic	Disaster with the potential to lead to shut down or collapse of asset/network
Major	A critical event that requires extraordinary / emergency business continuity actions
Moderate	A serious event that requires additional emergency business continuity actions
Minor	An adverse event that can be absorbed by taking business continuity actions
Insignificant	Impact can be absorbed through normal activity

Using the ratings for likelihood and consequence climate change risks (likelihood x consequence = risk) are then classified by levels of risk, as per Table 17.3. Risks classed as 'Medium', 'High' or 'Extreme' are considered significant.

When assessing the consequence of a specific risk, several categories were considered including:

- Asset damage
- Health & safety
- Environmental
- Social
- Financial
- Reputation

- Cultural heritage and cultural premises

Table 17.3 presents the criteria for assessing the likelihood of a climate hazard occurring, based on the data collected from Climate Ireland's Data Explorer. An example of a climate hazard occurring could be an increase in summer temperatures.

Table 17.3: Climate hazard occurrence likelihood descriptors

Likelihood of hazard	Description (probability)
Very Likely	90-100% probability that the hazard will occur.
Likely	66-90% probability that the hazard will occur.
Possible, about as likely as not	33-66% probability that the hazard will occur.
Unlikely	10-33% probability that the hazard will occur.
Very Unlikely	0-10% probability that the hazard will occur.

The criteria displayed in Table 17.4 is used to assess the likelihood of a climate related impact occurring as a result of a specific climate hazard. A climate impact is considered an effect that a climate hazard may have on the Proposed Development. For example, increased summer temperatures leading to unsuitable working conditions for construction. This assessment is based on UKCP18 data and knowledge of site-specific conditions.

Table 17.4: Climate impact occurrence likelihood descriptors

Likelihood Category	Description (Qualitative)	Probability (Quantitative)
Rare	Highly unlikely to occur	5%
Unlikely	Unlikely to occur	20%
Moderate	As likely to occur as not	50%
Likely	Likely to occur	80%
Almost Certain	Very likely to occur	90%

The definitions for consequence of climate change impacts is presented in Table 17.5, and have been adapted from those displayed in the EU technical guidance for assessing climate change risk. The level of consequence defines how severely a climate impact will influence the Proposed Development.

Table 17.5: Level of consequence definitions

Level of consequence of climate impact **Definition of Consequence**

Catastrophic	Disaster with the potential to lead to shut down or collapse of asset/network
Major	A critical event that requires extraordinary / emergency business continuity actions
Moderate	A serious event that requires additional emergency business continuity actions
Minor	An adverse event that can be absorbed by taking business continuity actions
Insignificant	Impact can be absorbed through normal activity

Using the ratings for likelihood and consequence climate change risks (likelihood x consequence = risk) are then classified by levels of risk, as per Table 17.6. Risks classed as 'Medium', 'High' or 'Extreme' are considered significant.

Table 17.6: Risk Matrix

		Measure of Consequence				
		Insignificant	Minor	Moderate	Major	Catastrophic
Likelihood of climate-related impact occurring	Rare	Low	Low	Medium	High	Extreme
	Unlikely	Low	Low	Medium	High	Extreme
	Moderate	Low	Medium	High	Extreme	Extreme
	Likely	Medium	High	High	Extreme	Extreme
	Almost Certain	High	High	Extreme	Extreme	Extreme

17.3.2 Greenhouse Gas Assessment Methodology

The study area for the GHG assessment, considers all direct and indirect GHG emissions that may arise from the construction, operation, and decommissioning of the Proposed Development. This includes direct emissions arising onsite e.g., from the combustion of fuel used in construction plant as well as indirect emissions from activities offsite that are sufficiently linked to the Proposed Development, such as transport of materials, waste and workers and embedded carbon in construction materials and products. This assessment has been conducted in line with IEMA guidance on Assessing Greenhouse Gas Emissions and Evaluating their Significance, PAS 2080 Carbon Management in Infrastructure and the ISO 14064 standard.

17.3.2.1 Sensitive Receptors

The global climate has been identified as a sensitive receptor for the GHG assessment. According to the latest IEMA guidance, the effects of GHGs are not geographically constrained and, subsequently, all development has the potential to result in a cumulative effect in terms of GHGs. For the purpose of assessing the impact on this receptor, GHG emissions arising from the Proposed Development have been presented in the context of Ireland's national GHG inventory and carbon reduction targets.

17.3.2.2 GHG Calculation

A lifecycle approach to calculating the GHGs has been adopted. This approach considers specific timescales and emissions from different lifecycle phases of a proposed development: product phase (construction materials), construction phase and operational phase.

GHG emissions, arising from the construction and operational activities, and embodied carbon in materials of the Proposed Development, have been calculated by multiplying activity data by a relevant emission factor:

$$\text{Activity data} \times \text{GHG emissions factor} = \text{GHG emissions in mass of CO}_2\text{e}$$

Activity data is a quantifiable measure of activity, such as operating hours or volumes of fuels used. Emission factors convert the activity data into GHG emissions. Activity data has been sourced from the Applicant, however, where specific data is not available, a mix of assumptions and industry benchmarks have been used to fill data gaps. Where this is not possible, then a qualitative approach to assessing the GHG impacts has been followed, in line with the IEMA guidance.

Emission factors and calculation methods have been sourced from publicly available sources, including Sustainable Energy Authority of Ireland (SEAI), UK Department for Energy Security and Net Zero (DESNZ), National Highways, Royal Institute of Chartered Surveyors (RICS), Institute of Civil Engineers – Civil Engineering Standard Method of Measurement Fourth Edition (CESMM4), and the Bath University Institute of Civil Engineers (ICE) Embodied Carbon Database.

In line with the GHG Protocol, when calculating GHG emissions, the seven Kyoto Protocol GHGs have been considered, specifically:

- Carbon dioxide (CO₂);
- Methane (CH₄);

- Nitrous oxide (N₂O);
- Sulphur hexafluoride (SF₆);
- Hydrofluorocarbons (HFCs);
- Perfluorocarbons (PFCs); and
- Nitrogen trifluoride (NF₃).

These gases are broadly referred to in this chapter under an encompassing definition of 'GHGs', with the unit of tCO₂e (tonnes CO₂ equivalent) or MtCO₂e (mega tonnes of CO₂ equivalent).

Table 17.7 outlines the GHG activity sources present and proposed that are potentially relevant to baseline conditions and construction and operational phases of the Proposed Development.

Table 17.7: Potential Sources of GHG Emissions

Phase	Activity	Primary Emissions Sources
Pre-construction (Enabling)	On site pre-construction activity i.e., enabling works, demolition of existing structures.	GHG emissions from fuel consumption by construction plant and vehicles, generators on-site, and worker commuting
	Transportation and disposal of earthworks/waste	GHG emissions from the vehicles required to transport and the associated waste emissions
Product Manufacture	Raw material extraction and manufacturing of products / materials	Embodied GHG emissions associated with product and material manufacture
	Transport of products / materials to Site	GHG emissions from fuel consumption of transport vehicles.
Construction	On-site construction activity	Energy (electricity, fuel, etc.) consumption from construction plant and vehicles, generators on-site and material consumption
	Transport of construction workers	Energy consumption from worker commuting.
	Transportation and disposal of earthworks/ waste	GHG emissions from transportation and disposal/treatment of earthworks and construction waste
Operations	Operation of the Proposed Development	GHG emissions from energy use, fuel consumption, additional traffic, provision of potable water and treatment of wastewater

Phase	Activity	Primary Emissions Sources
	Transportation and disposal of waste	GHG emissions from the transportation and disposal of operational waste.
	Building and grounds maintenance	GHG emissions associated with replacement materials/products
	Emissions displacement	Avoided or displaced emissions through use of any renewable energy systems of offsetting.
	Landscaping	Changes in GHG emissions/sinks from landscaping and re-vegetation
Decommissioning	Removal and/or renewal of the Proposed Development	GHG emissions arising from fuel consumption of plant and vehicles, and the disposal or recycling of materials.

17.3.2.3 GHG Significance Criteria

The IEMA guidance states that the following three principles need to be considered when evaluating the significance of GHG impacts on the climate in EIA:

- all project GHG emissions will contribute to climate change;
- climate change has the potential to lead to significant environmental consequences that may affect all topics in the EIA Directive (e.g., Biodiversity, Water, Landscape, Geology, Air Quality, Human Health); and
- GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit, as such that any GHG emissions or reductions from a project might be considered significant.

Based on these principles, the IEMA guidance states that “the significance of a project’s emissions should therefore be based on its net impact over its lifetime, which may be positive, negative or negligible”.

The guidance has identified two major considerations when assessing the significance of a project’s GHG emissions: alignment to a trajectory towards net zero by 2050, and mitigation of GHG emissions. It is down to the professional judgment of the practitioner to determine how best to contextualise and assess the significance of a project’s GHG impact.

The IEMA guidance also emphasises the importance of implementing GHG mitigation measures to help minimise GHG emissions, regardless of the magnitude of emissions, and states that the level of mitigation should be used to assess the significance of GHG emissions. This has therefore been factored into the assessment criteria for the GHG assessment.

Based on the above two considerations, and in line with criteria outlined in the IEMA guidance, the following significance table, as shown in Table 17.8, will be used to assess the significance of GHG emissions arising as a result of the Proposed Development.

Table 17.8: Significance of Effects for GHG Impact Assessment

Effects	Significance Level	Description
Significant adverse	Major adverse	- The project's GHG impacts are <u>not mitigated</u>. - The project has <u>not complied</u> with do-minimum standards set through regulation, nor provide reductions required by local or national policies; and <u>No meaningful contribution</u> to Ireland's trajectory towards net zero.
	Moderate adverse	- The project's GHG impacts are <u>partially mitigated</u>. - The project has <u>partially complied</u> with do-minimum standards set through regulation, and have <u>not fully complied</u> with local or national policies; and <u>Falls short of full contribution</u> to Ireland's trajectory towards net zero.
Not significant	Minor adverse	- The project's GHG impacts are mitigated through 'good practice' measures. - The project has complied with existing and emerging policy requirements; and - Fully in line to achieve Ireland's trajectory towards net zero.
	Negligible	- The project's GHG impacts are mitigated beyond design standards. - The project has gone well beyond existing and emerging policy requirements; and - Well 'ahead of the curve' for Ireland's trajectory towards net zero.
Beneficial	Beneficial	- The project's net GHG impacts are <u>below zero</u> and it causes a <u>reduction</u> in atmosphere GHG concentration. - The project has gone <u>well beyond</u> existing and emerging policy requirements; and

Effects	Significance Level	Description
		Well 'ahead of the curve' for Ireland's trajectory towards net zero, provides a <u>positive climate impact</u>.

It is suggested that sectoral, local, or national carbon budgets can be used, as available and appropriate, to contextualise a project's GHG impact. IEMA guidance states that the significance of a project should not be determined based on the magnitude of the GHG emissions and whether it will release GHG emissions. It should be concluded by establishing if it will contribute to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero.

17.3.2.4 Alignment to 2050 Net Zero Trajectory

The IEMA guidance states that the crux of assessing significance is "not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050". The trajectory of GHG emissions associated with the Proposed Development has therefore been factored into the assessment criteria.

17.4 Baseline and Projected Environment

17.4.1 CCR Assessment

17.4.1.1 Climate Baseline Data

To effectively use climate change projections for the purpose of a risk assessment, it is necessary to first understand the historical climate conditions experienced at the location. Baseline climate data is provided in Table 17.10 whilst Section 17.4.1.2 provides information on past extreme events experienced at the Site of the Proposed Development.

17.4.1.2 Past Extreme Events

The following events are examples of extreme climatic conditions experienced at or near the Site in the past:

- Orange wind warning in April 2023 for Co. Kerry, where wind speeds reached up to 110km/hr.
- Road closure of the N67 approximately twice per year due to high tide and overtopping of the sea wall creating surface water..
- Major 'violent' storms Eunice, Barra and Ellen since 2020. Resulted in winds of >100km/hr and significant rainfall.

17.4.1.3 Climate Change Projection Data

In understanding how the climate is expected to change in the future it is important to consider broad, qualitative trends as well as location specific, quantitative projection data.

Qualitative projection data

Future trends for key climate variables in Ireland are summarised using information available from Climate Ireland's '*Essential Climate Information*'.

Table 17.9: Key Message - Climate Change Projections Ireland

Climate Variable	Key Trend	Key Message
 Surface air temperature	Average surface air temperatures are expected to increase everywhere and across all seasons	An increase in the intensity and duration of heatwaves is expected
 Precipitation	An increase in seasonality in precipitation can be expected with significant decreases projected for spring and summer and increases for winter.	An increase in the occurrence of extreme rainfall events is likely.
 Hydrology	Increasing seasonality in hydrological regimes can be expected with decreased summer and increased winter flows likely.	Flood risk is expected to increase across Ireland while increases in the frequency of drought conditions is also expected.
 Windspeed	An increase in the intensity of extreme windstorms is expected.	Projections indicate a decrease in wind speeds for summer and increases for winter.
 Sea Level Rise	Sea levels are expected to increase for all Irish coastal areas.	Projected changes in sea level will magnify the impacts of changing storm surge and wave patterns in coastal areas.
 Waves and surges	A decrease in mean and extreme wave heights are expected by the end of the century.	The magnitude and intensity of storm wave heights are expected to increase.

Storms and associated high wind speeds are a major natural hazard risk identified in Ireland. Most notable high impact storm events were those that occurred during the winters of 2013/2014 and 2015/2016, resulting in widespread disruption from high winds and persistent flooding. Future projections show an increase in the number of very intense winter storms over Ireland from the middle of the century. It should be noted that because extreme storms are rare events, storm projections should be considered with a level of caution.

Quantitative Projection Data

The quantitative climate change projection data for the Site is presented in Table 17.10 alongside the climate baseline data for the study area. Definitions of the climate variables considered for this assessment are provided in Table 17.11. As previously discussed, the climate change scenarios adopted of this CCR assessment were RCP 4.5 and RCP 8.5.

Table 17.10: Climate Change Baseline and Projection Data

Climate Variable	Baseline (1981- 2000)	Climate Change Projection RCP4.5 (2041-2060)	Climate Change Projection RCP8.5 (2041-2060)	Projected Change in Likelihood
Temperature				
Mean annual maximum daily temperature (°C)	14.0	+1.1 (15.1)	+1.4 (15.4)	↑
Mean annual minimum daily temperature (°C)	7.4	+1.1 (8.5)	+1.4 (8.8)	↑
Mean summer maximum daily temperature (°C)	19.3	+1.2 (20.5)	+1.6 (20.9)	↑
Mean winter minimum daily temperature (°C)	3.5	+0.9 (4.4)	+1.3 (4.8)	↑
Number of frost days per annum	16.7	-52.3% (8.0)	-63.8% (6.0)	↓
Number of heatwaves per annum	2	3.9	6.2	↑
Highest temperature for baseline period (°C)	30.6	-	-	
Lowest temperature for baseline period (°C)	-8.2	-	-	
Rainfall				
Mean annual rainfall (mm)	985.3	-1.5% (970.5)	-1.0% (975.4)	↓
Mean summer rainfall (mm)	214.8	-3.7% (206.9)	-8.3% (197.0)	↓
Mean winter rainfall (mm)	278.9	-0.4% (277.8)	+2.1% (284.8)	↑
Wettest month on average (mm)	December (110.3)			
Driest month on average (mm)	April (57.4)			

Climate Variable	Baseline (1981- 2000)	Climate Change Projection RCP4.5 (2041-2060)	Climate Change Projection RCP8.5 (2041-2060)	Projected Change in Likelihood
Wet days >20mm (days per annum)	4.2	+12.5% (4.7)	+21.8% (5.1)	↑
Very wet days >30mm (days per annum)	0.75	+20.7% (0.9)	+29.9% (1.0)	↑
Highest daily rainfall (mm) for baseline period	44.3			
Other				
Sea level rise (m)		0.2	0.25	
Snowfall		-61%	-67.8%	↓
Potential Evapotranspiration (mm)	1.6	+2.7% (1.64)	+2.8% (1.65)	↑
Mean wind speed (knots)	9.23	-2.3% (9.01)	-2.8% (8.97)	↓
Storms	The number of very intense storms is projected to increase over the North Atlantic region in the future (2041-2060), under RCP8.5, projections suggest that the winter tack of these storms may extend further south and over Ireland more often. Under RCP4.5, the projects are similar, though with a weaker signal.			

Table 17.11: Climate Variables Definition

Climate Variable	Definition
Summery dry days	Projected change number of dry periods defined as at least 5 consecutive days on which daily precipitation <1mm
Heatwaves	Periods of at least three consecutive days where maximum temperatures exceed >95% of the normal monthly distribution
Wet days	Projected change (%) in number of days with rainfall >20mm
Very wet days	Projected change (%) in number of days with rainfall >30mm
Frost days per annum	Projected change (%) in the number of days when minimum temperatures are <0°C
Wind speed	Projected change (%) in windspeed at 10m elevation
Sea level rise	Median projections of regional sea level rise, relative to a 1995-2014 baseline

Climate Variable Definition

Snowfall	Projected change (%) in the snowfall

17.4.2 GHG Assessment

The baseline environment or the “Do Nothing Scenario” refers to the scenario in which the Proposed Development is not developed. As the Site is located on already developed (brownfield) land of the Tarbert Power Station, which is due to cease operation in December 2023, the baseline emissions for the Site is currently considered zero as no carbon will be sequestered or emitted at the Site when the Proposed Development is due to begin construction. Land use change is not considered due to Site already consisting of inactive developed land (brownfield).

17.5 Potential Impacts

17.5.1 CCR Assessment

17.5.1.1 Initial Risk Profile

The initial CCRA risk rating is shown in Table 17.12. Using the methodology described in Section 17.3.1, a total of 11 climate change risks were identified for the construction and operation stages of the Proposed Development. Due to the similarity of the two future baseline scenarios (RCP 4.5 and RCP 8.5) to 2060, the same climate change risks were identified for each scenario.

The medium risk identified related to the vulnerability of the Proposed Development to inundation from coastal flooding from the Shannon estuary. The Proposed Development falls within Flood Zone A for tidal/coastal flooding (EIAR Chapter 12: Water Environment), meaning there is a high probability of coastal flood events within the Site boundary. This indicates that flood defence measures above standard practice are required for appropriate flood risk mitigation.

Table 17.12: Initial CCRA Risk Rating

Risk Rating	Moderate emissions scenario RCP 4.5 2040-2060	High emissions scenario RCP 8.5 2040-2060
	Initial risk profile	Initial risk profile
Low	10	10
Medium	1	1
High	0	0
Extreme	0	0

17.5.1.2 Embedded Controls

As aforementioned, planned, or embedded controls represent measures already included in the design and operation of the Proposed Development that work to mitigate the climate risk. These measures are usually included in the design and / or operation of an asset as they represent best practice design or management. Table 17.13 provides embedded controls adopted for the Proposed Development.

Table 17.13: Embedded Controls

Project Phase	Embedded Controls
Construction	Monitor weather forecasts and plan work schedules, accordingly, avoiding work during periods of extreme temperature/heatwaves and extreme rainfall. More detail to be provided in the CEMP.
Design	Sea level storm surge protection for the Site boundary. More detail can be found in EIAR Volume I, Chapter 12: Water Environment. Use of resilient and sustainable materials. Avoid topographic low points and install drainage as detailed in EIAR Volume I, Chapter 12: Water Environment, to prevent surface water flooding. OCGT to be raised above peak flood level to prevent flood damage.
Operation	Storm water management plans Storage of pollutant material will be adequately protected from extreme weather and flood damage. Minimise maintenance during extreme weather events (e.g., strong winds). Maintenance of the drainage system to be included within general site management.

17.5.1.3 Adaptation Measures

Climate change adaptation for infrastructure projects is the process of adjustment to actual or expected climate and its effect to increase resilience, moderate harm and exploit beneficial opportunities. There are a range of measures or options that are available and appropriate for addressing climate change adaptation often described as either Grey, Green or Soft:

- **Grey Actions** - Technical or engineering-oriented responses to climate impacts, for example the construction of a sea wall in response to sea level rise or the consideration of climate change projections in the design of drainage structures
- **Green Action** - Use nature-based solutions to enhance the resilience of human and natural systems, for example the addition of green spaces to infrastructure projects to counteract urban heat island effect, or the use of drought and heat tolerant species in landscaping.
- **Soft Actions** - Alterations in behaviour, regulation, or systems of management such as increased monitoring of climate change impacts during operation, or the consideration of climate risk in asset management plans. They are flexible and inexpensive to implement.

In the identification and implementation of adaptation measures, it is critical that early engagement between the relevant stakeholders occurs i.e., engineers, environmental assessment professionals or asset owners. Early and proactive engagement is the most effective way of eliminating and reducing climate change impacts on a project, thereby reducing the need for additional and costly measures late in design or during operation.

Table 17.14: Adaptation Measures Identified

Project Phase	Adaptation Measures	Proposed / Implemented
Construction	Contractor to monitor weather forecasts to ensure adequate protections for construction crews. Contractor to develop and follow the Construction Environmental Management Plan (CEMP), which will be prepared as part of the planning application.	Proposed
Operation	Flood defence scheme to protect power station at a level of +4.8mAOD	Implemented

As described in EIAR Volume II, Appendix 12A: Flood Risk Assessment, the Proposed Development is located within Flood Zone A for coastal/tidal flooding. Due to this, the Flood Risk assessment has recommended a flood defence scheme of +4.8mAOD to adequately protect the Proposed Development. The flood risk assessment considers a Mid-Range Future Scenario (MRFS) for future climate change impacts, showing significant flooding during a 10% AEP event, with floodwater reaching levels of 3.5mAOD during these events. Given this, the recommendation of +4.8mAOD is considered sufficient to mitigate the flood risk for the Proposed Development. Further details on the flood risk to the Site and proposed flood defences, please refer to EIAR Volume I, Chapter 12: Water Environment.

17.5.2 GHG Assessment

The quantity and significance of the GHG emissions associated with the Proposed Development are presented in Section 17.6.2.

17.6 Residual Impacts

17.6.1 CCR Assessment

17.6.1.1 Residual Risk Profile

Residual risk represents the risk profile resulting after the implementation of adaptation measures. The residual risk rating for the Proposed Development, (assuming the implementation of the identified adaptation measures), is summarised in Table 17.15.

As described above, the flood defence scheme as presented in EIAR Volume II, Appendix 12A: Flood and Drainage Risk Assessment, is considered sufficient to reduce the profile of the medium risk identified.

Table 17.15: Residual Risk Profile

Risk Rating	Moderate emissions scenario RCP 4.5 2040-2060		High emissions scenario RCP 8.5 2040-2060	
	Initial risk profile	Residual risk profile	Initial risk profile	Residual risk profile
Low	10	11	10	11
Medium	1	0	1	0
High	0	0	0	0
Extreme	0	0	0	0

17.6.1.2 Significance

Assuming all proposed adaptation measures are successfully implemented, no significant climate change risks have been identified for the Proposed Development. For a full breakdown of identified climate risks and their embedded and proposed adaptation measures, refer to Appendix 17A, EIAR Volume II.

17.6.2 GHG Assessment

17.6.2.1 Construction Phase Impacts and Effects

To assess the magnitude of impacts on the climate through GHGs associated with construction of the Proposed Development, the emissions that will be associated with the project activities have been calculated and listed in Table 17.16 and Table 17.17 based on the assumptions listed:

- Construction is expected to begin in Q3 2024 and last up to 29 months.
- Construction is assumed as 67 hours per week.
- The embodied carbon of construction products has been estimated using RICS benchmarked emissions factors. This approach has been taken due to a lack of available information on construction materials associated with operational plant. As the vast majority of emissions associated with the Proposed Development will occur during operation, this approach is considered valid.
- Calculations of the embodied carbon associated with waste disposal and enabling works are derived for the Proposed Development.
- Construction materials transport emissions have been calculated based on the estimated daily traffic generation in Chapter 14 Traffic and Transport (EIAR Volume I) and are assumed to be a 50km round trip.
- Worker commute trips are assumed to be 50km (round trip), and are also derived from the estimated traffic during construction as found in Chapter 14 Traffic and Transport (EIAR Volume I)
- Emissions are assumed to occur at a constant rate during the construction phase.

Table 17.16: Construction Phase GHG Emissions

Lifecycle Phase	Emissions Source	Emissions (tCO ₂ e)	% Construction Phase Emissions
Product	Embodied carbon of materials and products	8,205	78.90
	Materials and product transport	18	0.17
Construction	Enabling works	702	6.75
	Fuel usage onsite	1,404	13.50
	Waste disposal	36	0.35
	Worker commute	34	0.33
Total		10,399	
Annual		4,303	

As stated in Section 17.3.2.3, all emissions are considered significant. To contextualise the level of significance, emissions are compared to the Irish carbon budgets. Emissions from the construction of the Proposed Development contribute considerably less than 1% of any carbon budget, refer to Table 17.17 for the complete breakdown of emissions over the construction period in comparison to Ireland's national carbon budgets.

Table 17.17: Construction GHG Emissions

Carbon Budget	Total Budget (tCO ₂ e)	Total Project Emissions within budget period (tCO ₂ e)	% Contribution of construction emissions
2021-2025	295,000,000	5,379	0.002
2026-2030	200,000,000	5,020	0.003

17.6.2.2 Operational Phase Impacts and Effects

To assess the magnitude of the climate change impacts through GHGs associated with operating and maintaining the Proposed Development, the GHGs that will be associated with the Proposed Development operational phase activities have been calculated and listed in Table 17.18, based on the assumptions detailed:

- Energy supplied to Site is assumed to be grid average electricity and its associated emissions were calculated using SEAI 2023 emissions factors. SEAI have not published forecasted emissions factors for the Irish electricity grid, therefore it is assumed the carbon intensity of the grid will remain constant over the operational lifespan of the Proposed Development. This is considered a conservative worst-case-scenario approach, as it is likely the future carbon intensity of the electricity grid will be lower compared to present day.

- The Proposed OCGT is assumed to operate for 1,800 hours/year.
- The Proposed OCGT will be fuelled by HVO.
- For the assumed operational hours, the Proposed Development is expected to consume 170,000 m³ of HVO annually.
- Operational emissions are based on a design life of 25 years.
- Fuel transport to Site is assumed to be via 100% laden diesel fuelled HGVs. Transport distance is assumed as 250 km (one-way) to allow for flexibility in the source of the HVO fuel. Transport emissions have been calculated on a tonne.km basis.
- SSE is committed to sourcing HVO that is third party Certified to RED-II under the ISCC. HVO will be sourced from 100% waste feedstocks, the raw materials for which are grown on a seasonal basis so there is no long-term “carbon debt”. Supplied HVO will comply with RED-II standards, which provides specific sustainability criteria and the carbon intensity of individual biofuels, including an assessment of the feedstocks used and the emissions from its production, processing and supply, and will be certified accordingly by a third party. There is an existing HVO supply chain and infrastructure in Ireland which the Proposed Development will utilise. The transport of HVO from this existing infrastructure to the Site has been considered in this GHG impact assessment.
- Emissions factors for HVO have been sourced from the UK DESNZ Government Conversion Factors for Company Reporting of Greenhouse Gas Emissions (2023) The emissions factor for the combustion of HVO is considered as 0.036 kgCO₂e/litre. The Well-To-Tank emissions factor for HVO, which includes emissions that occur up to the point of delivery is considered as 0.28 kgCO₂e/litre.

Table 17.18: Operational GHG Emissions

Lifecycle Phase	Project Activity / Emissions Source	Annual Emissions (tCO₂e)	Total Lifecycle Emissions (tCO₂e)	% of Project Operational Emissions
Operational Phase	Fuel usage on-site (Scope 2 – HVO Consumption)	6,049	151,215	9.86%
	Fuel usage on-site (Scope 3 – HVO WTT)	47,335	1,183,370	77.19%
	Energy usage on-site (Scope 2 – Electricity Generation)	4,440	111,000	7.24%

Lifecycle Phase	Project Activity / Emissions Source	Annual Emissions (tCO ₂ e)	Total Lifecycle Emissions (tCO ₂ e)	% of Project Operational Emissions
	Energy usage on-site (Scope 3 – Electricity T&D)	516	12,900	0.84%
	Water Use	39	976	0.06%
	Fuel Transport to Site (HGV within Ireland)	2,942	73,560	4.8%
		Total 61,321	1,533,021	

As presented in Table 17.18, the majority of emissions associated with the operational phase are the Scope 3 Well-To-Tank (WTT) emissions relating to the HVO fuel upstream of the Proposed Development. This is expected for an OCGT using HVO. The relative proportion of emissions associated with its WTT component is much higher for HVO when compared to traditional fuel sources, explaining its higher proportion of scope 3 emissions. Despite this, HVO is an overall far lower-carbon intensity fuel. This is summarised in Plate 17.2.

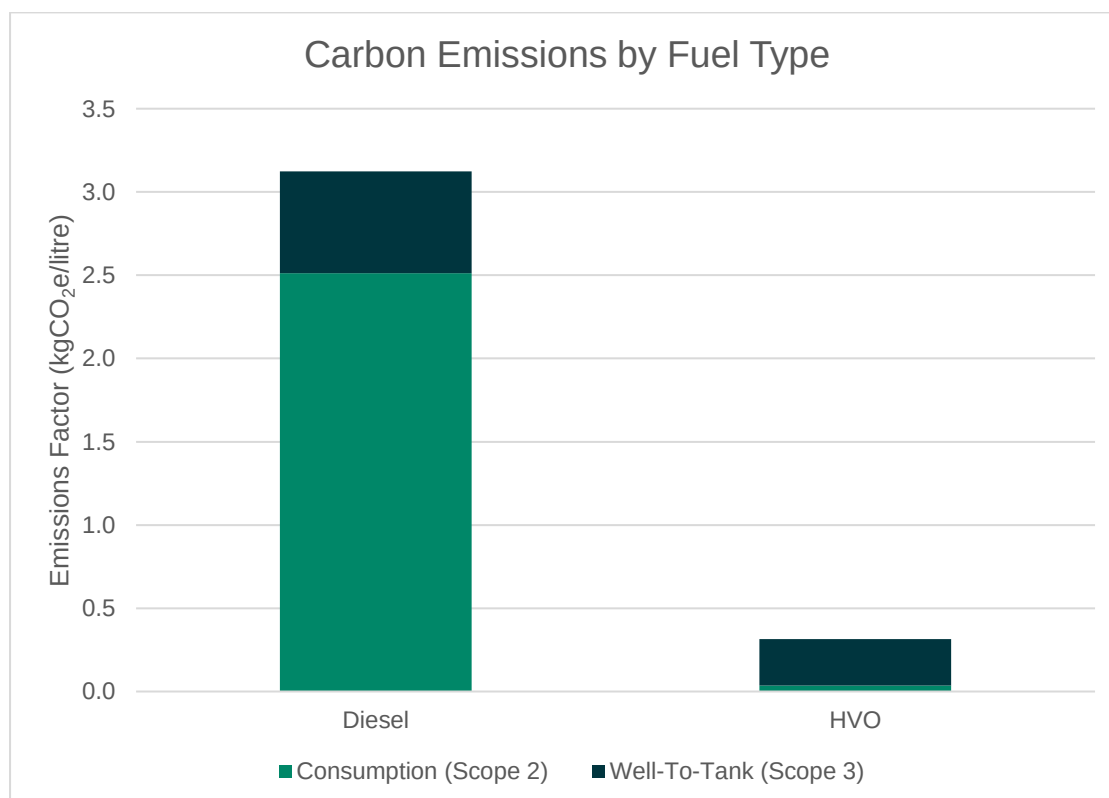


Plate 17.2: Comparative use and WTT emissions factors of Diesel and HVO fuels. Emissions factors sourced from *DESNZ (2023), 'GHG emissions factors for company reporting'*.

17.6.2.3 Decommissioning Phase Impacts and Effects

The GHG impacts that will occur during the decommissioning phase of the Proposed Development have estimated in accordance with the following assumptions.

- Direct demolition emissions have been calculated using benchmarked demolition emission factors from the CESMM4.
- As details surrounding the decommissioning phase is not currently available, it is assumed that worker transport and fuel use during decommissioning will be equivalent to the emissions that occurred during the construction phase. This is considered a worst-case-scenario as construction methods and plant fuel types are expected to decarbonise into the future.

The emissions expected to occur during the decommission phase of the Proposed Development have been summarised in Table 17.19.

Table 17.19: GHG impacts during decommissioning phase.

Lifecycle Phase	Emissions Source	Emissions (tCo2e)	%	Decommissioning Phase Emissions
Decommissioning	Embodied	19	1%	
	Fuel use	1,404	97%	
	Worker Transport	34	2%	
Total		1,457		

17.6.2.4 Significance

In light of Ireland's national climate objective to achieve net zero carbon by 2050, and in line with IEMA guidance on Assessing Greenhouse Gas Emissions and Evaluating their Significance, the GHG impact of the Proposed Development (construction, operation and decommissioning) has been reviewed in line with Ireland's current carbon budgets to 2035 (Table 17.19), noting that the Proposed Development is proposed to begin construction in Q2 2024, with the construction period lasting up to 29 months. The Proposed Development has a design life of 25 years.

For the purpose of this assessment all GHG emissions associated with the Proposed Development have been considered in the context of Irish national carbon budgets. This includes the scope 3 emissions (WTT) associated with the production of HVO fuel. While a proportion of these emissions may occur outside of Ireland, carbon emissions are not geographically restrained, with the receptor being the global climate. This comparison is therefore considered a conservative worst-case-scenario approach.

Table 17.20: GHG Emissions and Ireland's Carbon Budgets

Carbon Budget Year	Total Budget (tCO₂e)	Total Project Emissions within budget period (tCO₂e)	% of contribution of Proposed Development emissions
2021-2025	295,000,000	5,379	0.002
2026-2030	200,000,000	240,084	0.12
2031-2035	151,000,000	306,604	0.2

To provide further context, the emissions of the Proposed Development have also been compared against the carbon budget for the electricity sector, as defined in the GoI Sectoral Emissions Ceilings (2022). The proportion of Proposed Development GHG emissions in relation to sectoral budgets is presented in Table 17.20.

Table 17.21: GHG Emissions and Ireland's Electricity Sectoral Carbon Budget

Sectoral Carbon Budget Year	Total Budget (tCO₂e)	Total Project Emissions within budget period (tCO₂e)	% of contribution of Proposed Development emissions
2021-2025	40,000,000	5,379	0.01
2026-2030	20,000,000	240,084	1.2

As per the IEMA guidance on assessing the significance of GHG emissions (Table 17.14), the Proposed Development is considered Minor Adverse, and therefore Not Significant when considering the ability of Ireland to achieve its stated net zero target.

When assessing the significance of the emissions associated with the Proposed Development it is important to consider the emissions that would arise in the case of a 'do-nothing' scenario where the Proposed Development does not go ahead. In this case, energy to support the national grid would need to be generated from an alternative source. For this assessment, the emissions associated with the energy output of the proposed OCGT is compared to emissions from sourcing equivalent energy (630,00 MWh) from a diesel fuelled OCGT and a natural gas fuelled OCGT. The efficiency of the OCGT turbine is assumed to be 40%, as advised in a written parliamentary response from the UK Department for Energy and Climate Change (2015). This comparison only considers the embodied and WTT emissions associated with each fuel source, not the embodied carbon associated with the construction of energy generation infrastructure (i.e., operational emissions only), this allows for a direct comparison between the predicted carbon intensity Proposed Development and that of alternative energy generation infrastructure. The results of this comparison are presented in Table 17.20.

Table 17.22: Energy Alternatives Analysis

Energy Source	Annual Emissions (tCO ₂ e)	Difference in Annual Emissions	% of Proposed Development Emissions
HVO OCGT	53,381	0	100%
Natural Gas OCGT	382,686	+329,304	717%
Diesel OCGT	511,945	+458,564	959%

As displayed in Plate 17.2, a HVO fuelled OCGT as present in the Proposed Development represents a significant reduction in emissions when compared to alternative methods of energy production and therefore contributes to an overall reduction in GHG emissions in relation to Ireland's carbon budgets.

17.7 Cumulative Effects

17.7.1 Interaction of Effects between the Various Elements of the Proposed Development

The potential cumulative impacts form the interactions between various elements of the Proposed Development, as described in Chapter 20: Interactions, have been considered in terms of impacts on Climate. Due to the proximity, scale and timelines associated with each element, there is potential for interaction as part of the Proposed Development.

17.7.2 Cumulative In-Combination Effects

Climate change is the result of cumulative impacts. As it is the result of innumerable minor activities, a single activity may itself result in a minor or insignificant impact, though when combined with many other activities, the cumulative effect could become significant. The GHG emissions assessment by its nature is a cumulative assessment and considers whether the Proposed Development will contribute significantly to emissions on a national level. By comparing the Proposed Development against the national inventory, as being representative of the global climate, the cumulative impact of the Proposed Development is being considered on a national scale.

The global climate is the receptor for climate change impacts and has the ability for holding GHG emissions. Regardless, as stated by IEMA, all GHG emissions are considered significant and therefore would contribute to climate change. While the impact of any individual proposed development may be limited, it is the cumulative impact of many proposed developments over time that could have a significant effect on climate change.

When addressing the cumulative impact of the Proposed Development it should also be considered on a sectoral scale. As previously noted, while the Proposed Development will result in direct emissions from the combustion of HVO, this is seen as necessary energy generation and produces significantly less GHG emissions than traditional alternatives. Additionally, the Proposed Development comprises a

key component of the transition to low-carbon energy by providing flexibility to allow for intermittent renewable energy (e.g., wind or solar) to be maximised.

17.8 Summary

17.8.1 Climate Change Risk Assessment

The CCRA has concluded that given the implementation of the above adaptation measures there are no significant residual climate change risks present for the Proposed Development.

17.8.2 Greenhouse Gas Assessment

GHG emissions from the construction and operation of the Proposed Development are deemed Not Significant and no further mitigation measures are proposed.

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SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 18 Waste Management

SSE Generation Ireland Limited

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Table of Contents

18.	Waste Management.....	18-1
18.1	Introduction	18-1
18.2	Legislation, Policy, and Guidance.....	18-1
18.3	Methodology	18-7
18.4	Baseline Environment.....	18-10
18.5	Potential Impacts	18-14
18.6	Mitigation Measures	18-18
18.7	Residual Impacts	18-19
18.8	Cumulative Impacts	18-19
18.9	Summary	18-19
18.10	References	18-20

Tables

Table 18.1:	Magnitude of Impact and Significance of Effect Criteria ¹⁶	18-8
Table 18.2:	C&D Waste Collected in Ireland in 2021	18-11
Table 18.3:	C&D Waste Treatment (tonnes) in Ireland in 2021	18-11
Table 18.4:	C&D Waste Treatment (%) in Ireland in 2021	18-11
Table 18.5:	Soil and Stone By-Product Notifications Submitted, 2021 ¹⁹	18-13
Table 18.6:	Hazardous Waste Generation and Management in 2021 ²⁰	18-13
Table 18.7:	Estimated Types of Material Use and Waste Arising from the Construction of the Proposed Development	18-14
Table 18.8:	Estimated Waste Generated in Demolition Works	18-15
Table 18.9:	Estimated Waste Generated in Excavation Phase.....	18-16
Table 18.10:	Estimated Waste Generated from Construction Materials	18-16
Table 18.11:	Standard, Good and Best Practice Recovery Rates by Material	18-17

Appendices (Refer to EIAR Volume II)

Appendix 18A: Resource and Waste Management Plan

18. Waste Management

18.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) details the findings of an appraisal of the effects of the Proposed Development on waste management.

This chapter sets out the relevant aspects of the current state of the environment and the future receiving environment and goes on to consider the impact of the Proposed Development on waste management.

For the purpose of this EIAR, waste is defined as per the European Waste Framework Directive (Directive 2008/98/EC) as “*any substance or object which the holder discards or intends or is required to discard*”.¹

Full details on the background and Site history are provided in EIAR Volume I Chapter 4 (Existing Site and Conditions), and details of the Proposed Development are provided in Chapter 5 (Description of the Proposed Development) and the Planning Statement submitted with the planning application for the project.

18.2 Legislation, Policy, and Guidance

The following legislation, policy and guidance is relevant to this chapter and was adhered to during the assessment presented within it.

18.2.1 Legislation and National Planning Policy

18.2.1.1 European Communities (Waste Directive) Regulations, 2011

The European Communities (Waste Directive) Regulations S.I. No. 126 of 2011² (as amended) transpose the requirements of the European Waste Framework Directive (Directive 2008/98/EC),¹ as amended by Directive (EU) 2018/851,³ into Irish legislation. The Regulations require that waste prevention programmes and waste management plans are established and that the waste hierarchy is applied. The waste hierarchy prioritises waste prevention, followed by preparing for reuse, recycling, other recovery (including energy recovery) and finally disposal.

For construction and demolition (C&D) waste, the Regulations² also require measures to be taken to achieve the following target:

- By 2020, the preparing for reuse, recycling, and other material recovery, including backfilling operations using waste to substitute other materials, of non-hazardous C&D waste excluding naturally occurring material defined in category 17 05 04 in the list of waste shall be increased to a minimum of 70% by weight.

¹ European Parliament and The Council of the European Union (2008). *Directive 2008/98/EC*.

² GOI (2011). *S.I. No. 126 of 2011 - European Communities (Waste Directive) Regulations 2011*.

³ EU (2018). *Directive (EU) 2018/851*.

To support the implementation of the waste hierarchy, the Regulations² also:

- Article 27: give provision for an operator to determine that a material is a by-product and not a waste, where certain conditions are met and if approved by the Environmental Protection Agency (EPA).
- Article 28: give provision for determining end-of-waste status, when a waste may cease to be a waste when it has undergone a recovery operation.

The assessment of waste within this chapter has taken account of the waste hierarchy in the management of waste, including the provisions under Article 27 and Article 28, and of the targets for recovery of non-hazardous C&D waste.

18.2.1.2 European Green Deal

The European Green Deal⁴ aims to transform the EU into a modern, resource-efficient, and competitive economy, ensuring:

- No net emissions of greenhouse gases by 2050;
- Economic growth decoupled from resource use; and
- No person and no place left behind.

The European Green Deal aims to improve the well-being and health of citizens and future generations by providing longer lasting products that can be repaired, recycled, and reused.

18.2.1.3 Circular Economy Action Plan

The European Commission's Circular Economy Action Plan (CEAP)⁵ provides a future-oriented agenda for achieving a cleaner and more competitive Europe by presenting a set of interrelated initiatives needed for accelerating the transformational change required by the European Green Deal.⁴ Section 4 of the CEAP highlights the importance of addressing waste exports from the EU and details the European Commission's aims to:

- Ensure that the EU does not export its waste challenges to third countries.
- Restrict exports of waste that have harmful environmental and health impacts in third countries; and
- Strengthen controls of shipments of waste and improve sustainable management of waste in these countries.

The CEAP also highlights the importance of monitoring and reporting progress and aims to transform waste management practices in construction, minimise waste generation and maximise resource efficiency.

18.2.1.4 Circular Economy and Miscellaneous Provisions Act 2022

The Circular Economy and Miscellaneous Provisions Act 2022⁶ provides for the following:

⁴ EC (2022). *A European Green Deal*.

⁵ EC (2020). *Circular Economy Action Plan*.

⁶ House of the Oireachtas (2022). *Circular Economy and Miscellaneous Provisions Act 2022*.

- The making by the Minister for the Environment, Climate and Communications of a circular economy strategy.
- The establishment of the Circular Economy Fund; to make provision in relation to the Environment Fund.
- The establishment by the EPA of a circular economy programme.
- For the use by local authorities of closed-circuit television and mobile recording devices in certain circumstances and for that purpose to amend the Waste Management Act 1996 and the Litter Pollution Act 1997.
- Inclusion of targets in respect of reused and repaired products and materials in waste management plans.
- The operation of the national waste collection permit office.
- Waste recovery levy.
- Making by the Minister for the Environment, Climate and Communications of regulations to regulate end-of-waste and by-product notifications to the EPA.
- Giving further effect to Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008.
- To amend the Waste Management Act 1996.
- Prohibition on certain licences relating to coal, lignite and oil shale and for that purpose to amend the Minerals Development Act 1940 and the Minerals Development Act 2017.
- Applications to the EPA for licences, reviews of licences or revised licences in circumstances where an order under section 181(2)(a) of the Planning and Development Act 2000 has been made, or is proposed to be made, by a Minister of the Government for development comprising or for the purposes of the activity to which the application relates and for that purpose to amend the EPA Act 1992; to give further effect to Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 and for that purpose to amend the Electricity Regulation Act 1999; and to provide for related matters.

18.2.1.5 A Waste Action Plan for a Circular Economy

A Waste Action Plan for a Circular Economy, Ireland's National Waste Policy 2020-2025⁷ ('the WAP') sets out Ireland's approach to transitioning to a circular economy.

For C&D waste, the WAP supports the provisions and targets of the European Communities (Waste Directive) Regulations² by undertaking to streamline the decision-making processes for by-product notifications and end-of-waste and updating best practice guidance in line with the waste hierarchy.

This document has been considered within the assessment as it sets out the priority approaches for the construction sector to support delivery of the national C&D waste recovery target.

⁷ GOI (2020a). *Waste Action Plan for a Circular Economy, Ireland's National Waste Policy 2020-2025*.

The WAP calls for the replacement of the existing Regional Waste Management Plans with a single National Waste Management Plan containing targets for reuse, repair, resource consumption and a reduction in contamination. The single plan will aim to build on the progress from 2015, strengthen national capacity and delivery while retaining a regional focus for implementation. Development of this National Waste Management Plan is currently ongoing with the draft closing for public consultation on 5 July 2023.

18.2.1.6 Draft National Waste Management Plan for a Circular Economy (the 'Draft Plan')

The Draft Plan⁸ sets out a framework for the prevention and management of waste in the Republic of Ireland ("Ireland") for the period 2023 to 2029. Its primary aims are to encourage sustainable consumption, prevent the generation of waste, improve the capture of materials to optimise circularity, and enable compliance to policy and legislation.

All three Regional Waste Management Planning Offices are currently engaged in the publication process with submissions and observations from the public consultation to be taken into consideration for its development.

18.2.1.7 Climate Action Plan 2023

Following on from Climate Action Plan 2021, Climate Action Plan 2023⁹ includes a suite of measures at different stages of implementation to help reduce waste and support the transition towards a circular economy. These include:

- Strengthening the regulatory and enforcement frameworks for the waste collection and management system, to maximise circular economy principles;
- Enactment of the Circular Economy and Miscellaneous Provisions Act 2021;
- Publication of the Whole-of-Government Circular Economy Strategy 2022-2023, including focus on awareness raising, Green Public Procurement, and international partnerships;
- Develop a Bioeconomy Action Plan;
- Develop new and expanded environmental levies to encourage reduced resource consumption and incentivise higher levels of reuse and recycling;
- Establish a Circular Economy Innovation Scheme; and
- Publication of the National Food Waste Prevention Roadmap 2023-2025.

18.2.2 Regional and Local Planning Policy

18.2.2.1 Southern Region Waste Management Plan 2015-2021

For the purposes of waste management planning, Ireland is divided into three Regional Waste Management Planning Offices: Southern, Eastern Midlands, and Connacht Ulster. Waste Management Plans for the three regions were published in May 2015. The Proposed Development is located within

⁸ mywaste (2023). *National Waste Management Plan for a Circular Economy*.

⁹ DECC (2022). *Climate Action Plan 2023*.

the Southern region. The Southern Region Waste Management Plan 2015-2021¹⁰ provides the framework for the prevention and management of wastes in a safe and sustainable manner.

The Proposed Development is likely to be subject to the framework of the National Waste Management Plan for a Circular Economy¹¹ once it is published by the Regional Waste Planning Offices.

18.2.2.2 Kerry County Development Plan 2022-2028

Kerry County Development Plan (CDP) 2022-2028¹² sets out the overall planning and sustainable development strategy for the county. The Kerry CDP:

- Replaces the Kerry CDP 2015-2021;
- Incorporates existing Town Development Plans (as extended and varied); and
- Requests the review of Local Area Plans (LAPs) for Tralee, Killarney and Listowel Municipal Districts within 12 months of the adoption of the CDP.

County Kerry's transition to a circular economy is cited as being one of the key areas for informing the CDP's Core Strategy, recognising that all resources are scarce and the importance of reuse, renewal and repair principles to minimise waste generation. In support of circular economy principles, this means that waste should be managed using the following waste hierarchy approach (in order) before disposal as the outcome:

1. Prevention;
2. Preparation for reuse;
3. Recycling; and
4. Recovery.

Additionally, the CDP includes the following relevant Waste Management Policy Objectives (POs):

- **KCDP 13-27:** Implement the Regional Waste Management Plan, focusing on waste reduction, reuse, recycling, and sustainable disposal of residual waste.
- **KCDP 13-28:** Facilitate the implementation of the current Regional Waste Management Plan, including any replacement or amending plans. Emphasise the adoption of the waste hierarchy and maximise waste diversion from landfills

There are no specific POs within the CDP for the management of C&D waste, however, there is a section on C&D waste that emphasises the need to apply the waste hierarchy approach and in alignment with the 70% target for reuse, recycling and recovery of man-made C&D waste in Ireland by 2020 set out by the European Communities (Waste Directive) Regulations 2011.

18.2.3 Circular Economy Checklists for Construction

This series of Circular Economy Checklists¹³ have been developed by the Southern Waste Region. The aim of the checklists is to raise awareness of the Circular Economy with key actors within the

¹⁰ Southern Waste Region (2015). *Waste Management Plan 2015-2021*.

¹¹ EPA (2021a). *What's being done Waste: Waste policy and planning*.

¹² Kerry Co. Co. (2022). *Kerry County Development Plan 2022-2028*.

¹³ Southern Waste Region (2021). *Circular Economy Checklists for Construction*.

construction sector who all have a role to play in making the sector more circular and provide some early considerations to contemplate.

18.2.4 Guidance

In the absence of specific guidance or requirements for waste Environmental Impact Assessment (EIA) in Ireland, professional judgement is used to determine the magnitude and significance of effect, considering the following EIA guidance.

18.2.4.1 EPA Guidelines on the Information to be Contained in Environmental Impacts Assessment Reports

The EPA Guidelines¹⁴ have been drafted with the primary objective of improving the quality of EIARs with a view to facilitating compliance (with the EIA Directive¹⁵). By doing so they contribute to a high level of protection for the environment through better informed decision-making processes. They are written with a focus on the obligations of developers (the ‘Applicant’) who are preparing EIARs. There are seven generalised degrees of effect significance that are commonly used in EIA:

- Imperceptible;
- Not Significant;
- Slight;
- Moderate;
- Significant;
- Very Significant; or
- Profound.

When more specific definitions exist within a specialised factor or topic, these should be used in preference to these generalised definitions.

18.2.4.2 IEMA Guide to Materials and Waste in Environmental Impact Assessment. Guidance for a Proportionate Approach

The Institute of Environmental Management and Assessment (IEMA) “*Guide to Materials and Waste in Environmental Impact Assessment. Guidance for a proportionate approach*”¹⁶ (IEMA Guidance) provides guidance on the key terms, concepts, and considerations for assessing the environmental impacts and effects of materials and waste, as part of the EIA process. The guide is focused on the UK regulatory framework, although the principles are broadly applicable to EU jurisdictions, and have been used to inform the assessment methodology. However, it is not possible to use part of methodology which compares project waste arisings against national landfill capacity since remaining landfill capacity data for Ireland is not available - therefore, waste arisings are compared against national waste arisings. The approach to applying sensitivity has not been applied since waste arisings are not compared to landfill capacity. Magnitude of impact has been aligned with significance of effects thresholds in the IEMA Guidance as show in Table 18.1. It is not possible to fully align these significance effects

¹⁴ EPA (2022a). *Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EIAR)*.

¹⁵ European Parliament and The Council of the European Union (2014). *2011/92/EU as amended by Directive 2014/52/EU*.

¹⁶ IEMA (2020). *IEMA Guide to Materials and Waste in Environmental Impact Assessment*.

thresholds with the EPA generalised definitions since the EPA Guidelines have seven generalised definitions and the IEMA Guidance has five thresholds.

The following guidelines have been adhered to in the preparation of the Construction Environmental Management Plan (CEMP) and Resource and Waste Management Plan (RWMP) (refer to EIAR Volume II Appendix 5A and Appendix 18A, respectively).

18.2.4.3 Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects

The EPA Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects¹⁷ provide a practical approach which is informed by best practice in the prevention and management of C&D wastes and resources from design through to construction and deconstruction. The guidelines provide clients, developers, designers, practitioners, contractors, sub-contractors, and competent authorities with a common approach to preparing RWMPs.

The guidelines address the best practice approach both prior to construction, including the stages of design, planning and procurement in advance of works on-site, and during construction, relating to the effective management of resources and wastes during construction or demolition operations.

18.3 Methodology

18.3.1 Study Area

The study areas for the assessment of impacts related to waste management have been defined in line with the IEMA Guidance. Two types of study area are defined in the IEMA Guidance:

- a 'Project Study Area' - relevant to waste generation; and
- an 'Expansive Study Area' - relevant to management of waste.

18.3.1.1 Project Study Area

The study area for waste arising from the construction of the Proposed Development comprises the area defined by the Site.

18.3.1.2 Expansive Study Area

The study area for assessing impacts of non-hazardous waste on waste arisings and inferred waste management capacity comprises Ireland due to the need to consider all available waste management infrastructure capacity. Waste management capacity is inferred from national waste arisings since data for national waste management capacity is not readily available.

The study area for assessing impacts of hazardous waste on waste arisings and on inferred waste management capacity also comprises Ireland, although it is noted that a proportion of hazardous waste arising in Ireland is managed outside of the country, refer to Table 18.6.

¹⁷ EPA (2021b). *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects*.

18.3.2 Methodology for Determining Construction Effects

The potential impacts of the Proposed Development with regards to waste management are the effects that waste arisings generated on-site will have on the capacity of waste management infrastructure in the study area and on meeting national targets for waste recovery.

The main construction phase impacts will be associated with the management of waste from:

- Demolition works (including removal of existing buildings, other structures and foundations).
- Site preparation and earthworks (including for new foundations and imported materials).
- Surplus or damaged construction materials.
- Packaging.
- Maintenance of plant and equipment used for construction; and
- Construction workforce activities.

In the absence of specific guidance or requirements for Ireland, professional judgement and available guidance, as noted in 18.2.4, used to determine magnitude and significance of effect by the following approach:

- Establishing the baseline waste arisings (and inferred infrastructure capacity) for the expansive study area.
- Estimating the likely types and quantities of waste that will be generated by the Proposed Development and the likely extent to which these will be recycled or recovered or require disposal.
- For each category of waste, comparing the likely waste arisings from the Proposed Development to the baseline waste arisings and confirming whether sufficient management capacity is expected to be available.
- Assessing whether the Proposed Development conforms to relevant Ireland and European waste policies and strategies, specifically regarding targets for the recovery of non-hazardous C&D waste (excluding naturally occurring soil and stones (waste code 17 05 04)).

The criteria used for assessing the magnitude of impacts and significance of effects are shown in Table 18.1 and combine the guidance provided in the EPA Guidelines on the Information to be contained in Environmental Impacts Assessment Reports on generalised degrees of effect significance that are commonly used in EIA and the guidance on magnitude and significance in the IEMA Guidance.

Table 18.1: Magnitude of Impact and Significance of Effect Criteria¹⁶

Magnitude of Impact IEMA Guidance / EPA Guidelines	Effect IEMA Guidance	Significance of Effect IEMA Guidance / EPA Guidelines	Criteria
No change / Imperceptible	Neutral	Neutral / Not significant	• Project achieves 100% overall material recovery / recycling (by weight) of non-hazardous C&D waste excluding naturally occurring material defined in category 17 05 04 in the List of Wastes. • Zero waste generation from the development.

Magnitude of Impact IEMA Guidance / EPA Guidelines	Effect IEMA Guidance	Significance of Effect IEMA Guidance / EPA Guidelines	Criteria
Negligible / Not Significant	Neutral or slight	Neutral or slight / Not Significant	- Project achieves 90-99% overall material recovery / recycling (by weight) of non-hazardous C&D waste excluding naturally occurring material defined in category 17 05 04 in the List of Wastes. - Project waste arisings are ≤1% of national waste arisings (for the relevant categories of waste).
Minor / Slight	Slight	Slight / Not significant	- Project achieves 60-89% overall material recovery / recycling (by weight) of non-hazardous C&D waste excluding naturally occurring material defined in category 17 05 04 in the List of Wastes. - Project waste arisings are 1-5% of national waste arisings (for the relevant categories of waste).
Moderate / Moderate	Moderate	Moderate / Significant	- Project achieves 30-59% overall material recovery / recycling (by weight) of non-hazardous C&D waste excluding naturally occurring material defined in category 17 05 04 in the List of Wastes. - Project waste arisings are 6-10% of national waste arisings (for the relevant categories of waste).
Major / Significant	Moderate or large	Moderate or large / Significant	- Project achieves <30% overall material recovery / recycling (by weight) of non-hazardous C&D waste excluding naturally occurring material defined in category 17 05 04 in the List of Wastes. - Project waste arisings are >10% of national waste arisings (for the relevant categories of waste).

The EPA Guidelines have two additional generalised definitions (very significant and significant) however these are not included since there are no equivalent criteria in the IEMA Guidance.

18.3.3 Methodology for Determining Operational Effects

The operational phase of the Proposed Development is expected to generate the following waste:

- Small quantities of oils and chemicals (including lubrication oils, propane, ammonia, compressor cleaning detergent, general oils, and greases for rotating machinery); and
- Bottles and canisters from gases stored on site.

General commercial waste arising from these maintenance activities are expected to include:

- Office waste;
- Worker waste (including food waste); and
- Packaging.

All operational wastes are expected to be **Negligible** in the context of national waste arisings and significantly less than those arising from the construction of the Proposed Development.

18.3.4 Methodology for Determining Decommissioning Effects

The Proposed Development has a design life of approximately 25 years' operation and as such, it is not possible to identify at this stage either the waste management routes or specific facilities that will be used, as these are liable to change over such a timescale.

Where decommissioning takes place, all above-ground components associated with the Proposed Development will be disassembled and removed from the Site, the waste types generated from this are likely to be similar or of a lesser magnitude than the construction effects. However, prior to removal of plant, all residues and operating chemicals will be cleaned out from the plant and disposed of at a suitably licenced facility.

All management of waste will be in accordance with the relevant regulations and waste will be transported by licenced waste hauliers to waste management sites which hold the necessary regulatory authorisation and/or permits for those wastes consigned to them. Therefore, decommissioning waste impacts have not been assessed.

18.3.5 Limitations and Assumptions

This assessment has been developed based on the following limitations and assumptions:

- Estimation of waste arisings from demolition, excavation and construction works are limited to those resulting from the buildings, structures and activities detailed in Section 5.2 of Chapter 5 (Description of the Proposed Development).
- Asbestos has been noted in at least one of the buildings proposed to be demolished. Therefore, a full Refurbishment Demolition Asbestos Survey (RDAS) and report will be carried out to confirm its extent, prior to any demolition works being carried out. An Asbestos Management Plan will be put in place, and any asbestos-containing materials will be disposed of in accordance with the Health and Safety Authority (HSA) Guidelines on Management and Abatement of Asbestos-Containing Materials¹⁸ prior to any demolition works commencing in the affected areas.
- Some site clearance will be required including soil, vegetation and hardstanding. The quantities of waste are anticipated to be small compared to the overall construction waste arisings. Waste arising from site clearance has been scoped out of this assessment as it is assumed that this waste will have a high recovery rate and is likely be recovered on-site rather than sent to landfill.
- There is no collated published information on the potential changes to the national waste arisings and inferred waste management capacity for the period within which the Proposed Development is expected to be constructed. Accordingly, the current baseline is assumed to apply.
- Other environmental impacts associated with the management of waste from the Proposed Development (e.g., on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage, or off-site transport of materials and waste) are addressed separately in other relevant chapters.

18.4 Baseline Environment

The current state of the environment comprises baseline information on waste arisings and waste management in Ireland. The baseline information has been sourced from the most recent data collated and published by the EPA¹⁹ as shown in Table 18.2 to Table 18.6.

¹⁸ HSA (2013). *Guidelines on Management and Abatement of Asbestos-Containing Materials*.

¹⁹ EPA (2022b). *Construction & Demolition Waste Statistics for Ireland*.

18.4.1 Construction and Demolition Waste Arisings

Table 18.2 summarises the types and quantities of C&D waste collected by authorised waste collectors in Ireland in 2021. It shows that 9,043,749 tonnes of C&D waste was collected, with the majority comprising soil, stones and dredging spoil (85.1%).

Table 18.2: C&D Waste Collected in Ireland in 2021

C&D Waste Type	Quantity Collected (tonnes)	Proportion of Total (%)
Bituminous mixtures	87,343	1.0%
Concrete, brick, tile and gypsum	608,235	6.7%
Metal	257,558	2.8%
Mixed C&D waste	362,380	4.0%
Segregated wood, glass and plastic	31,946	0.4%
Soils, stones and dredging spoil *	7,696,287	85.1%
Total	9,043,749	100%

* Hazardous contaminated soil generated in Ireland in 2021 amounted to 32,951 tonnes. 32,624 tonnes were treated at facilities in Ireland, whilst 327 tonnes were exported for treatment.²⁰

18.4.2 C&D Waste Management

Table 18.3 and Table 18.4 set out the treatment methods used for managing C&D waste in Ireland in 2021, as reported by the EPA.¹⁹ Waste treatment by backfilling was the most utilised treatment method, managing 85.3% of C&D waste, mainly comprising soils, stones and dredging spoil waste type.

Table 18.3: C&D Waste Treatment (tonnes) in Ireland in 2021

C&D Waste Type	Treatment Type				
	Recycling (tonnes)	Energy Recovery (tonnes)	Backfilling (tonnes)	Disposal (tonnes)	Total (tonnes)
Bituminous mixtures	41,150	1,505	33,449	8,527	84,631
Concrete, brick, tile and gypsum*	262,685	1,244	299,725	16,568	580,223
Metal waste	272,734				272,734
Mixed C&D waste	398	73	88,747	34,356	123,573
Segregated wood, glass and plastic	50,348	13,918	743	407	65,417
Soils, stones and dredging spoil		34	7,251,952	450,267	7,702,253
Waste treatment residues	51,892	9,323	39,122	114,580	214,917
Total	679,208	26,098	7,713,738	624,705	9,043,749

*No gypsum was backfilled or landfilled.

Table 18.4: C&D Waste Treatment (%) in Ireland in 2021

C&D Waste Type	Treatment Type			
	Recycling (%)	Energy Recovery (%)	Backfilling (%)	Disposal (%)
Bituminous mixtures	48.6%	1.8%	39.5%	10.1%
Concrete, brick, tile and gypsum**	45.3%	0.2%	51.7%	2.9%

²⁰ EPA (2023). *Hazardous waste statistics for Ireland*.

C&D Waste Type	Treatment Type			
	Recycling (%)	Energy Recovery (%)	Backfilling (%)	Disposal (%)
Metal waste	100.0%	-	-	-
Mixed C&D waste	0.3%	<0.1%	71.8%	27.8%
Segregated wood, glass and plastic	77.0%	21.3%	1.1%	0.6%
Soils, stones and dredging spoil	<0.1%	<0.1%	94.2%	5.8%
Waste treatment residues	24.1%	4.3%	18.2%	53.3%
Total	7.5%	0.3%	85.3%	6.9%

The EPA reported that in 2021, 96% of C&D waste underwent final treatment within Ireland, with 4% exported for final treatment.¹⁹

The reported quantities of C&D waste collected (Table 18.2) and treated (Table 18.3) in Ireland differ. The EPA identifies that the differences are due to the data being collated from different datasets. Waste collectors record waste as it enters the waste treatment network, whereas the final treatment data indicates what happens to waste at the end of its journey through the waste treatment network. This can lead to differences in waste classifications and quantities.

The EPA's Progress to EU Targets²¹ reports Ireland's performance against targets set out in European Directives. In terms of the Waste Framework Directive (2008/98/EC)¹ target of '*Preparing for reuse, recycling and other material recovery (incl. beneficial backfilling operations using waste as a substitute) of 70% by weight of non-hazardous construction and demolition waste (excluding natural soils & stone), by 2020*', a performance of 78% was reported for 2020, exceeding the 70% target.

18.4.3 Waste Management Facilities

The waste management facilities to be utilised by the Proposed Development are not yet known and suitability will be determined by the appointed Contractor. Waste disposal and recovery activities in Ireland require authorisation in accordance with the Waste Management Act 1996 as amended. A waste recovery or disposal activity at a facility is either:

- an exempted activity (no authorisation required), or
- requires a Waste (or IPC) licence, or
- requires a Waste Facility Permit, or
- requires a Waste Certificate of Registration / Registration Certificate.

The EPA is the competent authority for granting and enforcing Industrial Emissions (IE) and Industrial Pollution Control (IPC) licences for specified industrial and agriculture activities including waste management.

18.4.4 Article 27: By-Product Notifications

Article 27 of the European Communities (Waste Directive) Regulations, 2011² allows an operator to decide, under certain circumstances, that a material is a by-product and not a waste. This provision is

²¹ EPA (2022c). *Progress to EU Waste Targets*.

often invoked in connection with C&D material, and particularly soil and stone. It allows materials to be used elsewhere in construction projects as a by-product and not discarded as a waste. Decisions made by economic operators under Article 27 must be notified to the EPA. The EPA may determine to agree with the economic operator's decision, as notified; alternatively, after consultation with the notifier and the relevant local authority, the EPA may determine that the notified material is waste^{Error! Bookmark not defined.}.

Table 18.5 summarises the soil and stone by-product notifications submitted to the EPA in 2021. The EPA received by-product notifications for 12,526,137 tonnes of soil and stone material. Notifications for 155,200 tonnes were withdrawn. The EPA determined that 459,836 tonnes of the soil and stone notified were by-product and that 600 tonnes were waste. The estimated quantity of soil and stone material notified in 2021 for which no determination was made to date, amounted to 11,913,301 tonnes.¹⁹

By-product notifications do not necessarily mean that any or all of the material was generated or indeed moved. Notifiers of by-product may not have proceeded with the activities related to the by-product notifications. However, if they did proceed, the materials would not have entered the waste management network or be included in the EPA's 2021 C&D waste statistics data. Only material notified as by-product, determined to be waste, generated and moved as waste in 2021 is covered by the EPA's C&D waste statistics data.

Table 18.5: Soil and Stone By-Product Notifications Submitted, 2021¹⁹

Soil and Stone By-Product Notifications	Quantity (tonnes)
Notifications withdrawn	152,400
By-product as notified	459,836
Determined as waste	600
No determination made	11,913,301
Total	12,526,137

18.4.5 Hazardous Waste Arisings and Management

The EPA reported that 466,941 tonnes of hazardous waste was generated in Ireland in 2021²⁰ and managed via the management routes shown in Table 18.6. The construction sector produced 22.8% of Ireland's hazardous waste in 2021.²⁰ The quantity of hazardous waste generated by construction and demolition depends on the amount of construction activity to redevelop brownfield sites and on dredging works. C&D waste also includes smaller quantities of asbestos-containing material, asphalt, as well as contaminated wood, concrete, bricks, metals, and tiles.

Table 18.6: Hazardous Waste Generation and Management in 2021²⁰

Waste type and Management Route	Quantity (tonnes)
Hazardous waste - treated at Irish hazardous waste treatment facilities	95,130
Hazardous waste - treated at EPA licenced facilities	115,951
Hazardous waste (excluding soils) – exported for treatment	222,909
Contaminated soil - treated in Ireland	32,624
Contaminated soil - exported for treatment	327

Waste type and Management Route

Quantity (tonnes)

Total

466,941

18.4.6 Future Receiving Environment

There is no collated published information on the potential changes to the national waste arisings for the period within which the Proposed Development is expected to be constructed. The Construction & Demolition Waste: Soil and Stone Recovery / Disposal Capacity - Update Report 2020²² presents a forecast of potential C&D waste arisings to the year 2029 that takes account of the sharp reduction in arisings due to the impact of the Covid-19 pandemic. These forecasts indicate that C&D waste arisings may return to pre-pandemic levels by 2025 / 2026. Accordingly, the current baseline is assumed to apply between the planned commencement of construction of the Proposed Development through to its opening year.

18.5 Potential Impacts

18.5.1 Assessment of Effects and Significance

Table 18.7 summarises the main types of materials that will be used and the wastes that are likely to arise during the construction phase of the Proposed Development.

Table 18.7: Estimated Types of Material Use and Waste Arising from the Construction of the Proposed Development

Activity	Material Use	Waste Arising
Site remediation, preparation, and earthworks, including excavation.	- Fill material for construction purposes. - Primary / secondary / recycled aggregates for ground stabilisation.	- Surplus excavated materials (limited excavation anticipated) - Surplus subsoil. - Unsuitable and contaminated soils and excavated materials. - Vegetation from site clearance (minor). - Clearance of redundant operational infrastructure. - Clearance of hardstanding.
Demolition	Installation of temporary supports and careful isolation of building structures from any adjacent structures	- Hard inert waste such as concrete and brick. - Non-inert waste such as wood, plasterboard and plastics. - Hazardous waste such as asbestos.
Construction	Main construction materials including: - Aggregates (including well graded materials, granular fill, backfill, pipe bedding and drainage media) - Asphalt and bituminous materials - In-situ cast concrete - Steel reinforcing bar (for reinforced concrete) - Precast concrete products (components, kerbs, drainage pipes, chambers and channels)	- Excess, offcuts, and broken / damaged construction materials. - Packaging from materials delivered to site. - Construction worker wastes from offices and rest areas / canteens. - Waste oils from construction plant.

²² GOI (2020b). *Construction & Demolition Waste: Soil and Stone Recovery / Disposal Capacity – Update Report*.

18.5.2 Estimated Waste Arisings

C&D waste estimates are based on material quantities/volumes included in a bill of quantities providing an overview of demolition, excavation and construction requirements and material quantities for the Proposed Development. Waste & Resources Action Programme (WRAP) construction, demolition and excavation waste volume to mass conversion factors²³ and National Highways material density factors²⁴ have been used to convert the material quantities/volumes provided to tonnes so that they can be assessed against C&D Waste Collected in Ireland in 2021 (Table 18.2).

The precise composition and volume of this waste is dependent on several factors and will be further informed by the appointed Principal Contractor, based on their experience of similar demolition works. All materials will be segregated, classified and disposed of off-site in line with the existing Industrial Emissions (IE) Licence for the station.

18.5.3 Do Nothing Scenario

In a 'Do Nothing' scenario, there would be zero waste generation and disposal from the Proposed Development and no significant effects.

18.5.4 Demolition Works

Table 18.8 summarises the types and quantities of estimated C&D waste that are anticipated to be generated during the demolition works of the Proposed Development. The demolition works is estimated to generate 37,161 tonnes of C&D waste (excluding soils, stones and dredging spoil), which would account for 2.8% of annual national C&D waste collected in Ireland.

Table 18.8: Estimated Waste Generated in Demolition Works

C&D Waste Type	Estimated Quantity (tonnes)	Proportion of national waste arisings (%)
Bituminous mixtures ¹	193	0.2%
Concrete, brick, tile and gypsum ¹	11,914	2.0%
Metal ²	4,137	1.6%
Mixed C&D waste ²	21,111	5.8%
Soils, stones and dredging spoil ¹	793	<0.1%
Total (excluding Soils, stones and dredging spoil)	37,161	2.8%

1. Converted to tonnes using National Highways material density factors²⁴

2. Converted to tonnes using WRAP Construction, demolition and excavation waste volume to mass conversion factors²³

The 793 tonnes of soil and stones estimated to be generated from demolition includes 193 tonnes of waste soil and aggregate generated due to earthwork material requirements to backfill excavated foundation areas of demolished buildings/structures. This estimate has been calculated by applying the WRAP²⁵ good waste rates for the materials.

²³ WRAP (2014). *Construction, demolition and excavation waste volume to mass conversion factors and List of Waste codes used in WRAP's tools.*

²⁴ National Highways (2021). *Carbon emissions calculator tool.*

²⁵ WRAP (2010). *Designing out Waste Tool for Civil Engineering workbook*

18.5.5 Excavation Works

Table 18.9 summarises the types and quantities of estimated C&D waste that are anticipated to be generated during excavation works in preparation for construction of the Proposed Development. Applying National Highways Material Density Factors,²⁴ the excavation works is estimated to generate 55,794 tonnes of soil, stones and dredging spoil waste, which would account for 0.7% of annual national C&D waste collected in Ireland.

Table 18.9: Estimated Waste Generated in Excavation Phase

C&D Waste Type	Estimated Quantity (tonnes)	Proportion of national waste arisings (%)
Soils, stones and dredging spoil	55,794	0.7%

18.5.6 Construction Phase

Table 18.10 summarises the types and quantities of estimated C&D waste that are anticipated to be generated during the construction phase of the Proposed Development. Applying National Highways Material Density Factors,²⁴ the construction phase is estimated to generate 891 tonnes of C&D waste (excluding soils, stones and dredging spoil), which would account for <0.1% of annual national C&D waste collected in Ireland.

Table 18.10: Estimated Waste Generated from Construction Materials

C&D Waste Type	Estimated Quantity (tonnes)	Proportion of national waste arisings (%)
Bituminous mixtures	112	0.1%
Concrete, brick, tile and gypsum	779	0.1%
Metal	1	<0.1%
Soils, stones and dredging spoil	599	<0.1%
Total (excluding soils, stones and dredging spoil)	891	<0.1%

18.5.7 Hazardous Waste

Hazardous waste arisings are expected to comprise small quantities of oils, chemicals and similar materials typically used as part of construction activities. Procedures for the storage and management of these wastes are set out in the RWMP, which will be implemented by the appointed Contractor and that Contractor will update the RWMP, where necessary, to comply with planning conditions and in agreement with Kerry County Council (KCC). Asbestos-containing material has been noted in at least one of the buildings listed for demolition however, a full RDAS and report will be carried out to confirm its extent and undertake a comparison against national waste arisings.

18.5.8 Total Waste Arisings

Total quantities of C&D waste requiring off-site management (excluding soils, stones and dredging spoil) are estimated to be 38,053 tonnes (37,161 for demolition and 891 for construction). This would account for 2.8% of annual national C&D waste collected, which is <5% of national waste arisings and this magnitude of impact is considered to be **Minor / Slight** as per the IEMA Guidance (Table 18.1).

Total quantities of C&D waste classified as soils, stones and dredging spoil across demolition, excavation and construction activities are estimated to be 57,186 tonnes. This would account for 0.7%

of annual national C&D waste collected, which is $\leq 1\%$ of national waste arisings and this magnitude of impact is considered to be **Negligible / Not Significant** as per the IEMA Guidance (Table 18.1).

Based on the IEMA Guidance (Table 18.1), the magnitudes of impact identified result in a **Slight / Not Significant** effect and sufficient management capacity is expected to be available.

18.5.9 Anticipated Recovery Rates by Material

The waste management facilities to be utilised during demolition and construction are not yet known and suitability will be determined by the appointed Contractor. Since it is not possible to estimate the exact composition of construction waste at this time, a total recovery rate in line with the national performance of 78% (reported for 2020), is anticipated and likely to be achievable for non-hazardous construction waste (excluding naturally occurring soil and stones (Waste Code 17 05 04)). The Proposed Development is therefore likely to achieve 60-89% or 90-99% overall material recovery / recycling (by weight) of non-hazardous C&D waste excluding naturally occurring material defined in category 17 05 04 in the List of Wastes, indicating a magnitude of impact is considered to be **Minor / Slight**, this is assessed to result in a **Slight (Not Significant)** effect.

Standard, good and best practice recovery rates by material are provided by WRAP.²⁶ Recovery rates for key construction materials and other construction wastes relevant to the Proposed Development are provided in Table 18.11.

Table 18.11: Standard, Good and Best Practice Recovery Rates by Material

Material	Standard Practice Recovery (%)	Good Practice Recovery (%)	Best Practice Recovery (%)
Metals	95	100	100
Packaging	60	85	95
Concrete	75	95	100
Inert	75	95	100
Plastics	60	80	95
Miscellaneous	12	50	75
Electrical equipment	<i>Limited information</i>	70	95
Cement	<i>Limited information</i>	75	95
Liquids and oils	100	100	100
Hazardous	50	<i>Limited information, cannot be 100% since some hazardous waste e.g., asbestos must be landfilled.</i>	

18.5.10 Summary

Total waste arising from the construction of the Proposed Development would account for <5% of national waste arisings (for the relevant categories of waste), this is assessed to result in a **Slight / Not Significant** effect and sufficient management capacity is expected to be available.

A total recovery rate of 78% is likely to be achieved for non-hazardous C&D waste (excluding naturally occurring soil and stones (Waste Code 17 05 04)) managed off-site. The majority of the good and best practice recovery rates for the main construction materials provided by WRAP are in excess of 90%.

²⁶ WRAP (2007). *Waste Recovery Quick Wins - Improving recovery rates without increasing costs.*

The Proposed Development is therefore likely to achieve 60-89% or 90-99% overall material recovery / recycling (by weight) of non-hazardous CDW excluding naturally occurring material defined in category 17 05 04 in the List of Wastes. This is assessed to result in a **Slight (Not Significant)** effect.

18.6 Mitigation Measures

18.6.1 Environmental Design and Management

A RWMP has been prepared for the Proposed Development, refer to Appendix 18A, EIAR Volume II.

A CEMP has been prepared for the Proposed Development to identify the minimum standards of environmental controls together with monitoring, inspection and reporting mechanisms to be adopted for all construction works, refer to Appendix 5A, EIAR Volume II. The Contractor will be required to develop a detailed CEMP in advance of the works commencing. The development of the detailed CEMP shall be in conjunction with the CEMP included in the planning application submission.

The RWMP and CEMP include design and construction measures that apply the waste hierarchy principles and minimise effects on waste. These include:

- Planning for the temporary on-site storage of soils, excavated materials and other materials to facilitate reuse.
- Reusing excavated materials within the construction of the Proposed Development, where possible, to minimise the need to import and export material.
- Considering the importation to site of recycled aggregate material, as an alternative to primary aggregate, and establishing procedures to ensure it is uncontaminated; and
- Establishing Key Performance Indicators (KPIs) for monitoring and reporting data on waste arising and diversion from landfill.

The RWMP which sets out measures relating to waste management that will be implemented during construction of the Proposed Development. Contractors will implement RWMP in accordance with the EPA Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects.¹⁷

The Contractor will regularly review and update where required the assumptions on waste arisings and management and record and implement procedures for assessing, managing, and recording waste arising on-site. Opportunities for on-site and off-site reuse, recycling and recovery of excavated material and waste will be identified where feasible. Where required, an Article 27 by-product notification will be prepared and submitted for the necessary approvals prior to the commencement of construction works.

18.6.2 Mitigation and Monitoring

As no significant waste effects have been identified, no further or additional mitigation or monitoring of significant effects is proposed.

The RWMP sets out monitoring to be undertaken during the construction phase to ensure that the mitigation measures embedded in the Proposed Development, and those considered essential to mitigate the effects of construction activities, are appropriately implemented.

18.7 Residual Impacts

There are no residual effects resulting from the Proposed Development.

18.8 Cumulative Impacts

Since the quantity of waste generated by the Proposed Development will be minimal, resulting in no likely significant effects, there are not expected to be any cumulative waste management impacts resulting from the Proposed Development together with the identified cumulative developments in the surrounding area. Therefore, cumulative effects are not considered further.

18.9 Summary

As no significant waste effects have been identified, no further or additional mitigation or monitoring of significant effects is proposed. There are **no residual** effects resulting from the Proposed Development.

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SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 19 Major Accidents and Disasters

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November 2023

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Table of Contents

19.	Major Accidents and Disasters	19-1
19.1	Introduction	19-1
19.2	Legislation, Policy and Guidance	19-2
19.3	Definitions	19-4
19.4	Methodology	19-5
19.5	The Proposed Development and Study Area	19-6
19.6	Potential Impacts	19-10
19.7	Mitigation Measures	19-28
19.8	Emergency Management	19-29
19.9	Cumulative Effects	19-29
19.10	Summary	19-30
19.11	References	19-32

Tables

Table 19.1: Identification of Credible Major Accident Scenarios	19-14
Table 19.2: Identification of Credible Potential Disaster Scenarios	19-21
Table 19.3: Assessment of Major Accident and Disaster Scenarios	19-24

Appendices (Refer to EIAR Volume II)

Appendix 19A: Technical Land Use Planning Report

19. Major Accidents and Disasters

19.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) presents the likely significant adverse effects arising from potential major accidents and disasters (MA&Ds) pertinent to the Proposed Development.

MA&Ds are incidents which can result in immediate or delayed significant harm to human health and/or the environment and require the use of resources beyond those of the Applicant or its Contractors to manage, such as the emergency services. In the context of this assessment, major accidents are typically anthropogenic in nature and include for example, the accidental loss of containment of significant quantities of dangerous substances such as natural gas and gas oil, leading to fires and / or explosions. Disasters are typically naturally occurring events, such as earthquakes, landslides and flooding, and can also include manmade or external hazards such as acts of terrorism.

In this assessment, the MA&Ds pertinent to the Proposed Development are identified and qualitatively assessed to determine the potential impact on the following receptors:

- Population and human health.
- Biodiversity, with particular attention to species and habitats protected under The Habitats Directive (EU Council Directives on Birds and Habitats (Council Directive 92/43/EEC)).
- Land, soil, water, air and climate.
- Property and material assets, cultural heritage, and the landscape.

The assessment of MA&Ds considers the full lifecycle of the Proposed Development, from construction, through operation, maintenance, and the eventual decommissioning of the facilities.

Credible MA&Ds scenarios which are identified are termed 'Risk Events' and the mitigation measures to reduce these risks are considered. These measures include the engineering design and operational controls to prevent MA&Ds, and if Risk Events were to occur, reduce their impact and severity. Mitigation measures are therefore considered, along with the anticipated emergency management arrangements which would be initiated if the Risk Event occurred.

For each Risk Event, the qualitative assessment contained in this chapter will conclude if sufficient measures are in place to reduce risks associated with reasonably foreseeable worst-case impacts to acceptable limits, or if further mitigation is required.

Full details on the background and Site history are provided in EIAR Volume I Chapter 4 (Existing Site and Conditions), and details of the Proposed Development are provided in Chapter 5 (Description of the Proposed Development) and the Planning Statement submitted with this planning application.

19.2 Legislation, Policy, and Guidance

This section identifies the relevant policy, legislation and guidance informing the scope of the assessment and sets out the requirements stipulated within Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 (the EIA Directive).

19.2.1 Legislation

The assessment of the vulnerability of the Proposed Development to MA&Ds is included within EIAR following changes to EU legislation within the revised EIA Directive 2014/52/EU and now transposed into Irish law *S.I. No. 191 of 2020 - European Union (Environmental Impact Assessment) (Environmental Protection Agency Act 1992) Regulations (as amended by S.I. No. 421 of 2022)*. The EIA Directive states the need to assess:

“the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and / or natural disasters which are relevant to the project concerned”.

In accordance with the requirements of the Regulations, an assessment of the potential risks of MA&Ds relevant to the Proposed Development is required. This assessment considers the measures envisaged to prevent or mitigate significant adverse effects on the environment associated with these incidents and provide details of the preparedness for a proposed emergency response should they occur.

Many regulations have been made which are of relevance to the control of MA&Ds of the Proposed Development, including the following:

- *Act No.10/2005* - Safety, Health and Welfare at Work Act (HSWA) (ISB, 2005). Including associated amendments:
 - *S.I. No. 231/2021* - Safety, Health and Welfare at Work (Chemical Agents) (Amendment) Regulations (ISB, 2021).
 - *S.I. No. 528/2021* - Safety, Health and Welfare at Work (Construction) (Amendment) Regulations (ISB, 2021).
- *Act No. 10/1972 (as amended by Act No. 21/1979)* - Dangerous Substances Act (ISB, 1972).
- *S.I. No. 272/2008* - European Communities (Classification, Packaging, Labelling and Notification of Dangerous Substances) Regulations (CLP) (ISB, 2008).
- *S.I. No. 566/2012* - European Union (Large Combustion Plants) Regulations (ISB, 2012).

Another regulation of importance to the Proposed Development is the EU SEVESO III Directive (2012/18/EU) which is implemented in Ireland through the Chemicals Act (Control of Major Hazards Involving Dangerous Substances) Regulations SI. No. 209/2015 (“the COMAH Regulations”). This applies to sites, such as the Proposed Development, which store significant quantities of hazardous materials which includes alternative fuel sources with similar purposes and properties to diesel and kerosene, such as Hydrotreated Vegetable Oil (HVO). The Proposed Development plans to store

volumes in a quantity which is above the 'Lower Tier' COMAH threshold. In combination with other storage on the SSE Tarbert site this may cross the threshold for an 'Upper Tier' COMAH site overall.

19.2.2 Policy

The Department of Housing, Local Government and Heritage (DHLGH) as part of the Government of Ireland has published a series of guidance documents in line with their Major Emergency Management Framework in order to set out arrangements for co-ordination at local, regional and national levels of emergency management. The framework also introduces a system to immediately determine a lead agency in all emergency situations¹.

The Kerry County Development Plan 2022-2028 (Kerry CDP, 2022), does not provide guidance regarding the assessment of MA&Ds but does refer to the implementation and control of Major Accident Hazard Sites, as defined by the SEVESO III Directive (2012/18/EU), within objective KCDP 9-91:

“Control the following, for the purposes of reducing the risk or limiting the consequences of a major accident (regard will be had to the provisions of the SEVESO III Directive and any regulations, under any enactment, giving effect to that Directive)

- *The siting of Major Accident Hazard sites.*
- *The modification of an existing Major Accident Hazard site; or*
- *Specified development in the vicinity of a Major Accident Hazard site.”*

19.2.3 Guidance

Key considerations for undertaking a MA&Ds assessment are provided in the EC Commission: Guidance on the preparation of the Environmental Impact Assessment Report (2017)².

There is no specific guidance available which sets out the approach for undertaking a MA&Ds assessment within an EIAR. However, the scope of the assessment has been developed with reference to “Major Accidents and Disasters in EIA: An IEMA Primer”³ (2020) which lays out emerging best practice.

Other guidance that is of relevance to the assessment of MA&Ds includes those published by the Environmental Protection Agency (EPA) in 2022⁴, the Health and Safety Authority (HSA) in 2023⁵ and the Chemicals and Downstream Oil Industries Forum (CDOIF)⁶ in 2017.

As an emerging topic within environmental impact assessment (EIA), the IEMA, EPA, HSA, and CDOIF Guidelines provide useful guidance on the assessment of MA&Ds via the application of a process involving hazard identification via the consideration of typical guidewords, assessment of consequences and the consideration of means to eliminate or mitigate credible scenarios. The methodology used within this assessment is detailed in Section 19.4.

¹ DHLGH (2021). *A framework for major emergency management*. Available at: <https://www.gov.ie/en/collection/ca182-a-framework-for-major-emergency-management/#documents-and-reports>

² EC Commission (2017). *Guidance on the preparation of the Environmental Impact Assessment Report*. Available at: environmental-impact-assessment-of-projects-KH0417939ENN.pdf

⁵ HSA (2023). *Guidance on Technical Land-Use Planning Advice*.

⁶ CDOIF (2017). *Guideline, Environmental Risk Tolerability for COMAH Establishments*

19.3 Definitions

For the purpose of this assessment, the definition of a 'Major Accident' is taken from the guidelines on MA&Ds within EIA published by IEMA.

"A major accident is an event (for instance, train derailment or major road traffic accident) that threatens immediate or delayed serious environmental effects to human health, welfare and / or the environment and requires the use of resources beyond those of the client or its appointed representatives (i.e., contractors) to manage".

Major accidents can be caused by disasters resulting from both man-made and natural hazards.

A disaster is a man-made / external hazard (such as an act of terrorism) or a natural hazard (such as an earthquake) with the potential to cause an event or situation that meets the definition of a major accident.

In general, major accidents and / or disasters should be considered as part of an assessment where the development has the potential to cause the loss of life, permanent injury and/or temporary or permanent destruction of an environmental receptor which cannot be restored through minor clean-up and restoration".

As the COMAH Regulations apply to the SSE Tarbert site, the criteria for a major accident listed in Schedule 6 (Regulation 19(2)) are appropriate for consideration in this assessment. These criteria (for a major accident) are listed below.

- An injury to a person which is fatal.
- Up to six persons injured within the establishment and hospitalised for at least 24 hours (hrs).
- One person outside the establishment hospitalised for at least 24 hrs.
- A dwelling outside the establishment which is damaged and unusable as a result of the accident.
- The evacuation or confinement of persons for more than 2hrs where the value (persons × hrs) is at least 500.
- The interruption of drinking water, electricity, gas or telephone services for more than 2hrs where the value (persons × hours) is at least 1,000.
- Permanent or long-term damage to terrestrial habitats:
 - 0.5 hectares (ha) or more of a habitat of environmental or conservation importance protected by legislation; or
 - 10 or more hectares of more widespread habitat, including agricultural land.
- Significant or long-term damage to freshwater and marine habitats:
 - 10km or more of river or canal.
 - 1.0ha or more of a lake or pond.
 - 2.0ha or more of delta; or

- 2.0ha or more of a coastline or open sea; or
- Significant damage to an aquifer or underground water: 1.0ha or more.
- Damage to property in the establishment, to the value of at least EUR 2 million.
- Damage to property outside the establishment, to the value of at least EUR 500,000.

19.4 Methodology

The assessment of MA&Ds has been based on the application of standard hazard identification and risk assessment methodology which is typically applied at COMAH Installations and follows the IEMA and EPA guidance where applicable.

This methodology aims to identify credible hazard scenarios which are pertinent to the Proposed Development by virtue of the substances present, operations carried out and the geographic location. For each scenario identified, the precautionary measures associated with these hazards are taken into consideration and the residual risk is assessed. Following implementation of mitigation measures, the residual risk should be commensurate with a level considered by the Health and Safety Authority and EPA to be 'as low as reasonably practicable' (ALARP).

A proportionate, precautionary approach has been used in this assessment, based on the relative likelihood of the credible hazardous scenarios identified. A greater level of detail will be applied to the assessment of scenarios which are considered more likely to occur, or to scenarios with potentially more significant consequences.

The approach used in this assessment is summarised as follows:

- Identify the hazardous substances which could be present over the lifecycle of the Proposed Development. These include flammable substances, materials harmful to the environment and materials harmful to human health.
- Consider the quantities and storage arrangements associated with these substances and the operations carried out at the Proposed Development involving these materials.
- Identify the credible major hazard scenarios associated with these materials and operations.
- Assess the location and vulnerability of the Proposed Development to hazards as a result of infrastructure, climatic conditions and geological events.
- In general, credible MA&D scenarios will fall into one of three categories:
 - a) Events that could not realistically occur, due to the substances present, the type of development or its geographic location.
 - b) Events that could realistically occur, but for which the Proposed Development, and associated receptors, are no more vulnerable than any other development; and
 - c) Events that could occur, and to which the Proposed Development is particularly vulnerable, or which the Proposed Development has a capacity to exacerbate.

- Where credible major accident or disaster scenarios are identified, describe the potential for any change in the relevant environmental and human health receptors in qualitative terms.
- Describe the mitigation measures which will be adopted during the design, construction and operation of the Proposed Development, to provide documented evidence to support and demonstrate that likely effects have been mitigated or managed to an acceptable level.

Section 19.6 contains a screening process to identify the credible Risk Events for further consideration. The specific mitigation measures associated with each Risk Event are presented in Section 19.6.4 and general mitigation measures to reduce risk are discussed in Section 19.8.

19.5 The Proposed Development and Study Area

19.5.1 Facilities

This section provides an overview of the Proposed Development, summarising the key features pertinent to the assessment of MA&Ds, full details are provided in EIAR Volume I Chapter 5 (Description of the Proposed Development).

The Tarbert heavy fuel oil (HFO) Power Station commenced operation in 1969 and is currently under the management of the Applicant as of 2012. The existing Tarbert HFO Power Station employed approximately 40 people on the Site until recently and contains four generators with a combined power generation of up to 626MW. At present the Site is classified as an upper-tier COMAH site, with only two of the four generators currently in operation. The Tarbert HFO Power Station is required to close by the end of 2023 in line with environmental requirements. As such the installation of the Proposed Development, in addition to other developments at the Site, will allow the SSE Tarbert site to continue generating electricity. However, between the decommissioning of the Tarbert HFO Power Station, expected to be completed by the end of 2023, and the operation of the Proposed Development, expected to commence in October 2026, a Temporary Emergency Generation (TEG) development will be introduced. This comprises of three Open Cycle Gas Turbines (OCGTs) with a combined power output of 150MW operating using distillate fuel. The TEG plant is expected to be decommissioned in 2028/2029.

The Proposed Development will be installed alongside the current Tarbert HFO Power Station building, with the objectives of supporting the expansion of Ireland's renewable energy generation capacity and the supply at times of peak demand when other sources of electricity generation are unable to meet the demand requirements. This installation will take place in conjunction with the demolition and removal of some of the ancillary structures and foundations at the existing Tarbert HFO Power Station. The demolition will be carried out as part of the construction and site preparation stage and will include the demolition / removal of the following structures:

- Chemical storage buildings (175m³).
- Water storage tank (18m x 15m).
- Water treatment plant (9500m³).
- Septic Tank.
- Fuel lines (2170m³).

- Carpentry workshop (1200m³).
- Contractor / Canteen building (3300m³).
- Boiler wash open top storage tank (5,500m³).
- Remnant foundations (50m³).
- ESB Building used by existing oil fired Tarbert Power Station (2800m³).
- Storage Bund and Propane Tanks; and
- ESB toilet block (300m³).

The Tarbert HFO Power Station's chemical inventory will be removed as part of the decontamination and decommissioning procedure and will be agreed with the EPA. This will be completed prior to the commencement of demolition and construction works associated with the Proposed Development.

The SSE Tarbert site also contains an 'Island Tank Farm' which comprises four HFO storage tanks each with a capacity of 29,500m³ located within the Proposed Development boundary. These tanks will be fully decommissioned, and HFO removed as part of the decontamination and decommissioning procedure of the Tarbert HFO Power Station.

The proposed plant includes an OCGT unit, alongside supporting systems and equipment. The fuel source to the OCGT will be Hydrotreated Vegetable Oil (HVO). HVO is to be stored on Site in quantities as required under the Grid Code.

The required volumes of HVO will be stored within dedicated storage tanks on-site. Sufficient storage capacity (approximately 10,300m³) will be provided to operate the Proposed Development for approximately 116 hours (depending upon the machine selected). The proposed above ground fuel storage tank will be bunded and connected to pumps for transfer to the generator.

As part of the Proposed Development, HVO will be supplied by Heavy Goods Vehicle (HGV) road tankers to the Site with two unloading bays positioned close to the fuel storage tanks. The majority of the HVO pipelines will be above ground with a short section (approximately 22m) laid underground to connect to the OCGT. HVO will be forwarded from the storage tanks to the proposed OCGT via the fuel polishing and transfer system in pipework. Minor modifications will be installed to the electrical transmission system on-site, comprising new connections to the existing electrical distribution systems.

The objective of the Proposed Development is to provide support to the expansion of Ireland's renewable energy generation capacity and the electricity supply system when other electricity generation sources are not sufficient to meet times of peak demand. The OCGT is not expected to operate continuously, it will likely remain on stand-by for the majority of the time and will run only when required to complement the Country's renewable power generation technology. It is proposed that the OCGT will operate for 1,800 hours annually (approximately 20% of the time).

19.5.2 Location and Receptors

This section provides a summary of the location of the Proposed Development and proximity to health, safety, and environmental receptors. A study area based on a radius of 5km from the Proposed Development has been considered. There is no definitive guidance on the required study area for MA&Ds, therefore this has been based on experience and judgement, ensuring that sensitive locations

are included. The selected study area extends to Donail to the north, Glin to the east, Tarmon to the south and Ralaphane to the west.

A description of the Site location is provided in EIAR Volume I Chapter 4 (Existing Site and Conditions) alongside a summary of environmental receptors. Detailed descriptions of individual environmental receptors are contained within the appropriate technical sections of the EIAR Volume I, particularly Chapter 9 (Biodiversity), Chapter 12 (Water Environment), Chapter 13 (Land and Soils) and Chapter 15 (Population and Human Health).

The Proposed Development will be located approximately 2km north of the town of Tarbert, adjacent to the Tarbert Ferry. The Site is bound from its south-east to south-west boundaries by open green fields, intersected with hedging and vegetation.

Residential Receptors

- The nearest residential receptors are located adjacent to the Site on the south-east boundary with the nearest residential settlement being the town of Tarbert, which is sited approximately 2km south of the Site. The village of Killimer is sited approximately 3km north of the Site across the River Shannon.

Industrial Receptors

- The TEG development which is proposed adjacent to the Proposed Development boundary is anticipated to include three Distillate fuel storage tanks each with a capacity of 1,000m³.
- A 'Mainland Tank Farm' not related to the power station which is managed and controlled by the National Oil Reserves Agency (NORA) is located approximately 410m south-west of the Site, the tank farm consists of four HFO storage tanks each with a capacity of 42,500 m³ for a total capacity of 170,000 m³. This tank farm is regulated as an Upper Tier COMAH Installation.
- Moneypoint Power Station is located approximately 4.3km north-west of the SSE Tarbert site. This is the Republic of Ireland's largest, and only coal-fired power station, and is regulated as an Upper Tier COMAH Installation. However, the power station is expected to cease coal burning activities as of 2025 and will instead operate using HFO from 2025 to 2029. During this period the power station will only operate to compensate for shortfalls in generation capacity that threaten consumer supply.

Ground and Groundwater

- The Proposed Development is not located in a groundwater source protection area. Groundwater within the bedrock aquifer in the environ of the Proposed Development is classified as locally important and there are three abstractions and wells used for domestic and industrial purposes within an area of up to 2km from the Site.

Water

- The nearest sites where bathing water quality is monitored, is the Cappa Pier, Kilrush, located approximately 10km north-west of the Site. The EPA 2022 report on *Bathing Water Quality in Ireland*⁷ classified this site as having 'Good' Bathing Water Quality.

⁷ EPA (2023). *Bathing Water Quality in Ireland 2022*.

- Cappa Pier is also a site used for fishing and recreational water sports.
- Glin pier, located approximately 5km east of the Site, is also a recreational ground for swimming events, such as triathlons.

Protected Environmental Sites

- The protected sites in the environ of the Proposed Development are:
 - Lower River Shannon Special Area of Conservation (SAC) [Site Code 002165]. Surrounding the Site boundaries.
 - River Shannon and River Fergus Estuaries Special Protection Area (SPA) [Site Code 004077]. Surrounding the Site boundaries.
 - Tarbert Bay Proposed Natural Heritage Area (pNHA) [Site Code 001386]. Adjacent to the south of the Site.
 - Clonderalaw Bay pNHA [Site Code 000027]. Located approximately 4.0km north-east of the Site.
 - St. Senan's Lough pNHA [Site Code 001025]. Located approximately 4.9km north of the Site.

Heritage Sites

- The Tarbert Demesne is part of the Archaeological Heritage Gardens Survey. The demesne comprises of a main house, walled garden and dense planting occupying the peninsula onto the Shannon Estuary. Development at Tarbert Power Station has encroached the northern extent with a row of tanks now present.
- Tarbert Island Battery is an Archaeological Asset which has since been demolished when the existing Tarbert HFO Power Station built over it.
- A burial site which was uncovered during constriction works at Tarbert HFO Power Station in May 1965. The burial and was located under a flagstone 1.2m below ground level and 5.5m from the shoreline of the Shannon Estuary, it is considered to be an Archaeological Asset.
- Demesne of Glin Castle and associated features, which is approximately 5km east of the Site and is an architectural conservation area with large numbers of tourists visiting annually.
- Tarbert Lighthouse which is an archaeological asset located on the northern tip of foreshore on Tarbert Island 90m to the north of the Proposed Development.
- Tarbert House, a protected structure and part of the Archaeological Heritage Building Survey, is located 930m to the south of the Proposed Development.

19.6 Potential Impacts

19.6.1 Hazardous Substances and Operations

19.6.1.1 Do Nothing

In the Do-Nothing scenario, the existing Tarbert HFO Power Station will be decontaminated and decommissioned (but no demolition works will be carried out). The previously consented TEG facility will be constructed and will be operational. The hazardous substances and operations associated with the Do-Nothing scenario will be similar to those currently present at the existing Tarbert HFO Power Station, consequently, the same types of MA&D scenarios would apply, although as a smaller facility the risks would be lower. The likelihood of these MA&D scenarios occurring, is considered to be very low as the power generation industry and HFO/distillate fuel facilities both at this Site and at facilities operated worldwide have a very good safety record and major accidents and disasters are very rare. The reduction in fuel storage quantities may reduce the COMAH status from upper tier (at present) to lower tier in the Do-Nothing scenario, this would be subject to a COMAH assessment.

Therefore, in the absence of the Proposed Development, there would still be a low risk of a MA&D occurring at the Site.

19.6.1.2 Construction Phase

The identification of potential MA&Ds during construction considers the substances which will be present, and the typical activities associated with the works, such as demolition works, ground preparation, excavation, construction of buildings and process structures including bulk storage tanks and bunding.

The following substances will be present at the Proposed Development during construction:

i. Construction materials such as liquid concrete

This material can be harmful to human health and the environment and will present in significant quantities during construction where it is used to construct buildings, site surfacing, equipment supports and other assets.

ii. Acetylene or nitrogen

These materials, contained in compressed gas cylinders, may be present on-site to carry out welding during construction activities.

iii. Distillate Fuel

This material will not be used as part of the Proposed Development but will be stored on the SSE Tarbert site to be used as fuel for the TEG plant, which is expected to be operational from 2024 until 2028/2029, and therefore will overlap with the construction of the Proposed Development. This material can be harmful to both human health and the environment, it is also highly flammable.

iv. HVO, Aqueous Ammonia and Sodium Hypochlorite

These materials will be used during the operational phase but may also be present during construction for the purposes of testing and commissioning of the plant, which may overlap with the construction phase. The details of their use during operation are specified in Section 19.6.1.3.

Demolition works will involve the deconstruction of ancillary buildings and chemical storage containers. The main risks involved with such activities includes falling debris, premature collapse of structures, release of hazardous dust (including asbestos), and failure to properly decommission / clean out the plant before demolition which could lead to release of substances toxic to the environment or flammable materials subsequently igniting.

Construction activities include works required to connect electrical power generated at high voltage (HV) at the Proposed Development to the transmission system via equipment such as transformers and switchgear. There are hazards associated with HV electricity, particularly during construction when work is carried out at or near to overhead power lines and underground cables. Contact with HV electricity can cause fatal injuries therefore must be carefully managed to control risks. An accident which causes an interruption to the supply of electricity to local residents and businesses could be within the criteria for a MA&Ds event.

General demolition and construction activities such as excavation, and deconstruction/construction of buildings and other structures will require the use of vehicles and tools. The hazards associated with activities include the potential for vehicle impact, particularly during reversing and vehicle overturning. The controls around this work will be carefully managed via risk assessment to control the risks to people, the environment and the existing operational areas.

The safety controls are detailed in the Construction Environmental Management Plan (CEMP), refer to EIAR Volume II Appendix 5A.

19.6.1.3 Operational Phase

The identification of potential Major Accidents during operation considers the substances present at the Proposed Development, identifying those which are potentially dangerous, such as flammable materials and substances toxic to human health and / or the environment. The assessment also considers the equipment in which these substances will be stored and used.

The following substances will be present at the Proposed Development during operation, the MA&Ds scenarios associated with each material are considered in Table 19.1.

i. HVO

This will be the source of fuel used to produce power and will be supplied to the Proposed Development. The installation will include construction of fuel storage tanks for the OCGT, with underground pipework running between them. HGV unloading facilities will also be installed for deliveries of HVO by road, as well as associated pipework, including fittings and instrumentation to supply HVO to the dedicated storage tanks. HVO will be stored within these above ground storage tanks to ensure an equivalent of approximately 116 hours of continuous operation (depending on the machine selected), as determined by the connection agreement for security of supply.

ii. Aqueous Ammonia

Selective Catalytic Reduction (SCR) will be fitted to the OCGT which will remove NOx from flue gas by injecting aqueous ammonia into a catalyst chamber. The aqueous ammonia will be stored in a dedicated storage tank, of dimensions 2.5m diameter and 5m length, to be directly injected to the SCR.

iii. Sodium hypochlorite

This material will be used for the sites water treatment works to create demineralised water for NO_x control within the OCGT. It will be stored on site in a bunded area, within a storage tank of dimensions 1.5m diameter and 1m height.

iv. Distillate Fuel

This material will not be used as part of the Proposed Development but will be stored on the SSE Tarbert site to be used as fuel for the TEG plant, which is expected to be operational from 2024 until 2028/2029. The Proposed Development is expected to begin operation in 2026, as such both developments will be operational at the same time.

v. Liquefied Petroleum Gas (LPG) e.g., propane

There will be a 10m³ propane tank on Site. Propane is commonly used in pilot ignition systems for combustion plant and as reference gases in the continuous emissions monitoring systems installed within the stack.

The following substances may also be present on the Site, albeit in much smaller quantities:

- Gas Oil (Diesel) will be stored in a storage tank on Site as part of the Sites containerised fire water module which includes a diesel fire pump. It will also be used in HGVs during operational traffic and transport (e.g., for HVO fuel deliveries).
- Hydrogen compressed gas stored in pressurised cylinders, used as a coolant in the gas combustion turbine generator cooling system.
- Acetylene or nitrogen contained in compressed gas cylinders may be present on-site to carry out welding when operational during maintenance activities.
- General oils and lubricants for rotating machinery.
- CO₂ compressed gas for fire suppression.

All materials will be safely contained on Site within dedicated storage tanks or appropriate containers, i.e., compressed gas cylinders. All materials will be stored in suitably bunded areas with weather protection and will be inspected regularly.

In addition, firewater runoff could be generated on-site during a major accident. In the event of a major fire on-site, water potentially containing a foam concentrate could be applied to extinguish fires within the HVO fuel storage area. Firewater generated in such an incident could contain a mixture of materials that are harmful to the environment if allowed to enter the ground and groundwater. These include un-combusted HVO, products of combustion and others. Consequently, firewater runoff is considered as a potentially dangerous substance in this assessment.

The Proposed Development does not include a heat recovery steam generator, therefore chemicals such as biocides and corrosion inhibitors will not be required. These materials are often used at power generation facilities which incorporate steam systems to treat water and effluent.

The OCGT system comprises a large combustion engine which mixes compressed air with HVO fuel, and the gaseous products drive a turbine to generate electricity. The system is housed within an

enclosure to provide a controlled environment, which incorporates pressurisation systems to prevent ingress of external hazardous materials such as dusts and flammable gases. OCGT systems use well established technology and are in operation within many facilities worldwide as they provide an efficient means of generating electricity very quickly. There are however recognised hazards associated with their use as they comprise complex, high speed components and operate at high temperatures and pressures with a flammable mixture of fuel in air. These systems must be carefully managed and controlled via safety systems; therefore, the use of this equipment is considered in the assessment of potential major accidents.

19.6.1.4 Decommissioning Phase

Where decommissioning takes place, all above-ground equipment associated with the Proposed Development will be disassembled and removed from the Site. However, prior to the removal of plant, all residues and operating chemicals will be cleaned out from the plant and recycled or disposed of at a suitably licenced facility. The majority of the plant and equipment will have some limited residual value as scrap or recyclable materials and will be recycled at the time.

Contamination prevention is a requirement of the IE Licence during the operational phase. Therefore, the Proposed Development has been designed to prevent new areas of ground contamination or pathways to receptors as a result of construction or operation. Once the plant and equipment have been removed to ground level the hardstanding and sealed concrete areas will be left in place.

Method statements and risk assessments for the activities described will be key mitigation measures adopted during the eventual decommissioning phase of the Proposed Development.

In addition to these measures, other general safety controls will be incorporated into a Decommissioning Plan (including a Decommissioning Environmental Management Plan (DEMP)) which will be produced when required and agreed as part of the Industrial Emissions (IE) Licence of the Site and site surrender process.

19.6.2 Identification of Potential Major Accidents

Table 19.1 contains a review of the potential accident scenarios which involves the substances used during the construction and operational phases, identifying the means by which a loss of containment may occur and assessing the likely significance of a release on human health, safety and the environment. The hazard codes of each substance are listed in accordance the Classification, Labelling and Packaging (CLP) Regulation (EC) No. 1272/2008.

The conclusions of the assessment of substances contained in Table 19.1 are that the main substances which will be present at the Proposed Development with the potential to initiate credible Risk Events are HVO, Distillate fuel and LPG. These scenarios are considered in further detail within Section 19.6.4 and Table 19.3.

Table 19.1: Identification of Credible Major Accident Scenarios

Substance	Description of Use	CLP Hazard Classification	Screening and Identification of Potential Major Accident Hazards	Further Assessment Required (Y / N)
HVO	HVO will be supplied to the Site via a pipeline running from the HVO offloading facility for road deliveries to storage tanks prior to use on demand in the turbine. The storage capacity of HVO on the Site is three bulk tanks of combined volume 10,300m³, which is sufficient for approximately 116 hours of continuous operation. From storage, HVO is forwarded via pumps to the new OCGT.	H226 - Class 3 flammable liquid and vapour. H304 - May be fatal if swallowed and enters airways. EUH066 - Repeated exposure may cause skin dryness or cracking.	The credible scenarios which could result in a release of HVO include the failure of or accidental damage to pipework, flexible hoses, storage tanks and transfer pumps which cause significant quantities of HVO to be released. This scenario could also include the failure of containment systems within delivery vehicles whilst on/travelling to Site. The maximum quantity of HVO which could be released may be up to several tonnes, depending on the type of incident. Though HVO is not classified as harmful to the environment, a significant release of it has the potential to cause a major accident if released to the environment, as it can cause major disturbances to the soil, groundwater and River Shannon, which contains protected species such as dolphins and water birds. If HVO vapour is ignited, this can result in a pool fire which has the potential to cause harm to people via thermal radiation and inhalation of smoke. The impact of a pool fire within a storage tank bund would be likely to be restricted to the Site, as high levels of thermal radiation would be unlikely at offsite receptors. A plume of smoke generated by a major fire would contain harmful substances such as particulate matter, however due to the size of the HVO tanks, in the worst-case pool fire scenario the plume would be unlikely to extend for a significant extent offsite. Consequently, there is the potential for a major accident scenario(s) associated with a significant loss of containment of HVO to the environment, therefore this scenario is considered further in this assessment.	Y Risk Event 1 Risk Event 2 Risk Event 3
Distillate Fuel	Distillate Fuel will be present on the SSE Tarbert site during construction and operation as part of the TEG project, which is proposed to have a storage capacity of 3,000m³ across three tanks. The TEG will be decommissioned in 2028/2029 at which point this material will be removed from the site.	H226 - Class 3 flammable liquid and vapour. H304 - May be fatal if swallowed and enters airways. H332 - Harmful if inhaled. H350 - May cause cancer.	The credible scenarios which could result in a release of Distillate fuel include the failure of or accidental damage to pipework, flexible hoses, storage tanks and transfer pumps which cause significant quantities of Distillate fuel to be released. This scenario could also include the failure of containment systems within delivery vehicles whilst on/travelling to Site. The maximum quantity of Distillate fuel which could be released may be up to several tonnes, depending on the type of incident. In the event of accidental damage to the storage tank, HGV tankers or associated pipework, there is the potential for a release of Distillate fuel to the surrounding environment. If it is released Distillate fuel has the potential to cause a major accident, as it can cause major disturbances to the soil, groundwater and River Shannon, which contains protected species such as dolphins and water birds.	Y Risk Event 1 Risk Event 2 Risk Event 3

Substance	Description of Use	CLP Hazard Classification	Screening and Identification of Potential Major Accident Hazards	Further Assessment Required (Y / N)
		H361d - Suspected of damaging the unborn child. H373 - May cause damage to organs through prolonged or repeated exposure.	If Distillate fuel vapour is ignited, this can result in a pool fire which has the potential to cause harm to people via thermal radiation and inhalation of smoke. The impact of a pool fire within a storage tank bund would be likely to be restricted to the Site, as high levels of thermal radiation would be unlikely at offsite receptors. A plume of smoke generated by a major fire would contain harmful substances such as particulate matter and potentially Sulphur Dioxide, however due to the size of the Distillate fuel tanks, in the worst-case pool fire scenario the plume would be unlikely to extend for a significant extent offsite. Consequently, there is the potential for a major accident scenario(s) associated with a significant loss of containment of Distillate fuel to the environment, therefore this scenario is considered further in this assessment.	
Aqueous ammonia	Aqueous ammonia will be stored on Site in a dedicated storage tank of approximate capacity 24.5m ³ . From storage it will be injected into the new SCR outfitted onto the OCGT.	H314 - Causes severe skin burns and eye damage. H335 - May cause respiratory irritation. H410 - Very toxic to aquatic life with long lasting effects.	The total volume of aqueous ammonia stored on Site is relatively low. In the event of accidental damage to the storage tank, HGV tankers or associated pipework, there is the potential for a release of aqueous ammonia to the surrounding environment. If it is released it can cause harm to people present, potentially causing damage to skin and eyes as well as causing respiratory issues especially within an enclosed area. The release of aqueous ammonia to the environment can also lead to contamination of the surrounding soil, groundwater and potentially aquatic life if it reaches the River Shannon. Although there is the potential for major accident scenarios to occur upon accidental release of aqueous ammonia, this is not considered a credible major accident scenario, as the quantities to be stored are relatively low. The containment systems which will be installed at the Proposed Development should be sufficient to prevent this material from reaching the environment. Therefore, no specific scenarios involving a release of aqueous ammonia are considered further in this assessment.	N
Sodium hypochlorite	Sodium Hypochlorite will be stored on Site in a dedicated storage tank of approximate capacity 1,600 L. From storage it will be directed to the Demineralization Water Treatment Plant.	H290 – Corrosive to Metals. H314 - Causes severe skin burns and eye damage. H318 – Causes serious eye damage.	The total volume of sodium hypochlorite stored on Site is relatively low. In the event of accidental damage to the storage tank, HGV tankers or associated pipework, there is the potential for a release of sodium hypochlorite to the surrounding environment. If it is released it can cause harm to people present, potentially causing damage to skin and eyes as well as causing respiratory issues especially within an enclosed area.	N

Substance	Description of Use	CLP Hazard Classification	Screening and Identification of Potential Major Accident Hazards	Further Assessment Required (Y / N)
		H335 – May cause respiratory irritation. H400 - Very toxic to aquatic life. H410 - Very toxic to aquatic life with long lasting effects.	The release of sodium hypochlorite to the environment can also lead to contamination of the surrounding soil, groundwater and potentially aquatic life if it reaches the River Shannon. Although there is the potential for major accident scenarios to occur upon accidental release of sodium hypochlorite, this is not considered a credible major accident scenario, as the quantities to be stored are relatively low. The containment systems which will be installed at the Proposed Development should be sufficient to prevent this material from reaching the environment. Therefore, no specific scenarios involving a release of sodium hypochlorite are considered further in this assessment.	
Firewater – effluent generated during fire-fighting	In the event of a major fire, application of firewater would be used to extinguish a fire and potentially to provide cooling to adjacent structures preventing escalation of the incident. A foam concentrate additive would typically be used in a fuel pool fire scenario which involved HVO or distillate.	Non-classified in accordance with CLP.	Firewater runoff would contain foam and other substances used for fire suppression along with products of combustion and un-combusted hydrocarbons. Modern foam concentrates do not contain substances classed as harmful to the environment; however, the firewater could contain products of combustion and un-combusted fuel. This material has the potential to cause harm if released to the environment. During the design of the Proposed Development, a detailed firewater containment assessment will be carried out, as required for a COMAH Installation. This assessment will involve the calculation of the total quantity of firewater which could be produced in a range of scenarios and will inform the design of containment facilities. Containment of firewater would therefore prevent material from being released offsite. This material would be collected for testing, treatment and disposal offsite at a suitable facility. Although there is the potential for a major accident scenario which involves the application of firewater, a release of firewater to the environment is not considered a credible major accident scenario due to the containment systems which will be installed at the Proposed Development to prevent this material from reaching the environment. Therefore, no specific scenarios involving a release of firewater are considered further in this assessment.	N
Gas Oil (Diesel)	Gas Oil (Diesel) will be used in the Sites Containerised Fire Water Module which will contain a diesel fire pump and associated storage tank	H226 - Flammable liquid and vapour. H304 - May be fatal if swallowed and enters airways.	In the event of accidental damage to the storage tank, or associated pipework, there is the potential for a release of gas oil (diesel) to the surrounding environment. If it is released gas oil (diesel) has the potential to cause a major accident, as it can cause major disturbances to the soil, groundwater, and River Shannon, which contains protected species such as dolphins and water birds, due to its high toxicity.	N

Substance	Description of Use	CLP Hazard Classification	Screening and Identification of Potential Major Accident Hazards	Further Assessment Required (Y / N)
		H315 - Causes skin irritation. H332 - Harmful if inhaled. H350 – May cause cancer. H373 - May cause damage to organs H410 - Very toxic to aquatic life with long lasting effects.	If gas oil (diesel) vapour is ignited, this can result in a pool fire which has the potential to cause harm to people via thermal radiation and inhalation of smoke. The impact of a pool fire within a storage tank bund would be restricted to the Site, as high levels of thermal radiation would be unlikely at offsite receptors. A plume of smoke generated by a major fire would contain harmful substances such as particulate matter, however due to the size of the gas oil (diesel) tanks, in the worst-case pool fire scenario the plume would not extend for a significant extent offsite. Although there is the potential for major accident scenarios to occur upon accidental release of Distillate fuel, this is not considered a credible major accident scenario, as the quantities to be stored are relatively low. The containment systems which will be installed at the Proposed Development should be sufficient to prevent this material from reaching the environment. Therefore, no specific scenarios involving a release of gas oil (diesel) are considered further in this assessment.	
Liquefied Petroleum Gas/Propane In Compressed Gas Cylinders	Propane cylinders may be used in pilot ignition systems and as reference gas in emissions monitoring systems. A 10m ³ propane tank will be present on site.	H220 - Extremely flammable gas. H280 - Contains gas under pressure; may explode if heated. H332 – Harmful if inhaled.	In the event of accidental damage to a gas cylinder, pressure regulator or associated pipework, there is the potential for a release of gas. If the gas released is ignited, this could result in a fire / explosion. In the event of a fire onsite which escalates to areas where gas cylinders are stored, there is the potential for an explosion if the cylinders are exposed to thermal radiation. The consequences of a fire / explosion could include harm to people if present in the vicinity of the cylinder(s) and damage to assets, potentially interrupting operation of the Proposed Development. Industry standard procedures will be used for the storage and use of gas cylinders which reduce the risk associated with these systems to a low level. When not in use, cylinders will be stored in external, well-ventilated areas and when in use, appropriately certified equipment will reduce the potential for ignition if a flammable gas is accidentally released. There is the potential for a major accident scenario(s) associated with a loss of containment of LPG, therefore this scenario is considered further in this assessment.	Y Risk Event 4
Compressed Gas Cylinders Typically	A small number of compressed gas cylinders containing hydrogen may be present on-site	H220 - Extremely flammable gas (Acetylene,	The number of cylinders containing extremely flammable gas used on Site will be relatively low.	N

Substance	Description of Use	CLP Hazard Classification	Screening and Identification of Potential Major Accident Hazards	Further Assessment Required (Y / N)
including: Hydrogen Acetylene	during operation as part of the power generator cooling systems. Propane cylinders may be used in pilot ignition systems and as reference gas in emissions monitoring systems. During construction and maintenance activities, welding may be carried out using compressed gases such as acetylene and nitrogen.	hydrogen, propane). H280 – Gas under pressure (all gas cylinders).	In the event of accidental damage to a gas cylinder, pressure regulator or associated pipework, there is the potential for a release of gas. If the gas released is ignited, this could result in a fire / explosion. In the event of a fire onsite which escalates to areas where gas cylinders are stored, there is the potential for an explosion if the cylinders are exposed to thermal radiation. The consequences of a fire/ explosion could include harm to people if present in the vicinity of the cylinder(s) and damage to assets, potentially interrupting operation of the Proposed Development. Industry standard procedures will be used for the storage and use of gas cylinders which reduce the risk associated with these systems to a low level. When not in use, cylinders will be stored in external, well-ventilated areas and when in use, appropriately certified equipment will reduce the potential for ignition if a flammable gas is accidentally released. Taking into consideration the small quantities of flammable gas stored in cylinders which will be present on-site and the safety and security measures which will be in place to store and use this material safely, it is considered that no credible major accident scenarios exist for these substances and are therefore not considered further in this assessment.	
Compressed Gas Cylinders (non-flammable) Including Nitrogen CO ₂ .	A small number of compressed gas cylinders containing CO ₂ will be installed to provide fire protection in enclosed areas of the turbine and generator. Nitrogen would typically be used during construction and maintenance activities to purge pipework and other uses.	H280 – contains gas under pressure	The number of cylinders containing nitrogen and CO₂ gas present on Site will be relatively low. In the event of accidental damage to a gas cylinder, pressure regulator or associated pipework, there is the potential for a release of gas. If gas is released within an enclosed area, this can cause harm to people present, potentially causing asphyxiation. The control measures for these substances are as described previously. Taking these into consideration along with the low numbers of cylinders which will be present, it is considered that no credible major accident scenarios exist for these substances and are therefore not considered further in this assessment.	N
Lubrication and Hydraulic Fluids	Mineral and synthetic oils are typically used within equipment such as generators and compressors to generate power and to provide lubrication for moving parts.	Typically, non-classified in accordance with CLP.	Lubrication and hydraulic fluids will be present on site in relatively small quantities and stored in suitable containment systems to prevent accidental damage and collect all stored material should a failure of the storage vessel occur. In the event of failure of the storage vessel and containment systems, there is the potential for a release of fluid however the quantity would not be sufficient to reach environmental receptors or cause significant harm to people, therefore would not	N

Substance	Description of Use	CLP Hazard Classification	Screening and Identification of Potential Major Accident Hazards	Further Assessment Required (Y / N)
	These materials are typically delivered and stored in small containers such as drums with a 200-litre capacity. Maintenance areas will be established for the storage of these substances, within fixed containment bunds.		result in a major accident. This scenario is therefore not considered further in this assessment.	
Concrete	Liquid concrete will be used in the construction of new facilities at the Proposed Development including buildings, surfacing and containment systems. Temporary storage systems will be present during construction of the Proposed Development and standard techniques will be used to pour cement onto prepared areas, for example, during the creation of tank bunds.	Typically, non-classified in accordance with CLP.	Concrete is not classified hazardous in accordance with CLP; however, concrete paste is alkaline (pH 10-14) and therefore harmful to people if in contact with skin or eyes. If concrete enters the environment via a release to water, it can raise the pH causing harm to aquatic ecosystems. Concrete released to the environment can also cause sedimentation on aquatic beds, which could harm flora and fauna. In the event of an accidental release occurring during construction, concrete/cement can raise the pH if released to water. Mitigation measures to prevent concrete reaching the Shannon Estuary are described in the Construction Environmental Management Plan (CEMP) and will be developed further in the Contractor's CEMP. This scenario is therefore not considered further in this assessment.	N

19.6.3 Identification of Potential Disasters

The identification of potential disaster scenarios which are pertinent to the Proposed Development is primarily based on an assessment of the geographical location. For example, highly unlikely events such as seismic events at the location of the Proposed Development have the potential to cause significant damage to assets and infrastructure such as HVO pipework and storage tanks. These events can result in a loss of containment of HVO leading to fires and/ or explosions.

The design life of the Proposed Development is expected to be 25 years; therefore, adverse impacts associated with climate change such as increased ambient temperatures, flooding and wind speeds are pertinent and are also considered in this Section.

The Proposed Development is located alongside the following facilities: the decommissioned Tarbert HFO Power Station; the TEG (total storage capacity 3,000 m³), which will be operational during the construction and the early operational years of the Proposed Development; a NORA operated Mainland Tank Farm (total storage capacity 170,000 m³); and the Moneypoint Power Plant. As such, there is risk of adverse events occurring at these facilities and escalating and to have an impact at the Proposed Development. These scenarios are referred to in the COMAH Regulations as 'Domino Events' and are also considered in this section along with accidents which are not directly related to dangerous substances identified in Table 19.2.

Disasters such as major storms and significant seismic events have a low probability of occurrence, however the potential consequences can reach the highest level of significance as defined in Section 19.3.

The potential disaster scenarios which have been assessed for the Proposed Development are described in Table 19.2.

The potential impacts of disasters are well understood by engineers involved with all aspects of the design, construction and operation of power stations such as the Proposed Development. These impacts are mitigated during the engineering design phase, for example, by the use of industry standard mechanical and structural design codes used for pipework, process equipment, supports and structural assets.

Taking into consideration the likelihood and consequences following the inclusion of mitigating measures, the overall risk of disasters occurring at the Proposed Development is considered to be very low but cannot be entirely eliminated. Consequently, additional measures associated with management of the Site such as operating procedures, accident prevention plans, and emergency response procedures will be in place prior to operation. These measures further reduce the risk and the consequences of disasters and are summarised in Section 19.8.

This assessment has identified one scenario where an incident such as a fire and / or explosion occurring adjacent to the existing NORA Mainline Tank Farm could escalate and potentially have an impact at the Proposed Development (and vice versa). This scenario is considered further in Table 19.3.

Table 19.2: Identification of Credible Potential Disaster Scenarios

Category	Description	Screening and Identification of Potential Accident / Disaster Scenarios	Included in Assessment (Y/N)
‘Domino Event’ Accident - Industrial accident at NORA tank farm which escalates to new facility (and vice versa)	The Site is in the vicinity of the NORA Mainland Tank Farm. An incident such as a fire at the Mainland Tank Farm could potentially reach the facilities associated with the Proposed Development and conversely, an event at the Proposed Development could reach the Mainland Tank Farm. This could result in an event which takes more resources to manage and has the potential to cause harm to people on Site, damage to property and assets. An explosion at the Mainland Tank Farm could generate projectiles which may reach the Proposed Development, causing harm to people on Site and damage to assets such as pipework which could result in a loss of containment. This has the potential to initiate a secondary incident at the Proposed Development. A plume of smoke generated by a fire on the Mainland Tank Farm could reach the air intake system of the OCGT causing asset damage and has the potential to interrupt operations on site.	The scenarios which are associated with a major fire and/ or explosion occurring at the Mainland Tank Farm would be initiated via a loss of containment of HFO via the same mechanisms as described for the Proposed Development in Table 19.1. The proximity of Mainland Tank Farm to the Proposed Development has the potential for the impact of these scenarios to be exacerbated, therefore this scenario is considered to be a credible potential disaster and will therefore be considered further.	Y Risk Event 5
‘Domino Event’ Accident – Industrial accident at Moneypoint which escalates to the Proposed Development (and vice versa)	An incident such as a fire occurring at a neighbouring industrial site (not associated with the Proposed Development) such as the Moneypoint ESB site on the northern bank of the River Shannon could potentially impact the Proposed Development via the same mechanisms as described in the previous disaster scenario.	There are several industrial sites located in the vicinity of the Proposed Development, including the upper tier COMAH site at Moneypoint ESB. An incident at this facility such as a fire could result in significant damage at that location but would be unlikely to have an impact at the Proposed Development due to distance. The impact of thermal radiation and explosion overpressure generated by an event at Moneypoint ESB would not be considered to have a sufficient magnitude at the Proposed Development, therefore it would be unlikely to cause significant harm to people or assets. Consequently, whilst this scenario would be considered a potential disaster at the Moneypoint ESB, is not considered further for the Proposed Development.	N
Structural Failure / Building Collapse during demolition / construction	An Incident such as a building collapsing during demolition activity (e.g., falls in wrong direction or off schedule) or during construction.	Demolition / construction activities conducted at the Site will be subject to the CEMP, which will consider the potential for collapses to occur and identify appropriate mitigation measures and safe systems of work to be adopted to reduce the risk to a very low level, therefore the risk of a disaster occurring is considered to be low and is not considered further.	N

Category	Description	Screening and Identification of Potential Accident / Disaster Scenarios	Included in Assessment (Y/N)
	This could result in an event which takes more resources to manage and has the potential to cause harm to people on Site, damage to property and assets.		
Accident-- High Voltage (HV) Electrical equipment	Electrical power will be generated at high voltage levels at the Proposed Development. Accidental contact with high voltage systems can be immediately fatal to people and accidents involving electricity have occurred particularly during construction activities, for example, where cranes have come into contact with overhead power lines. Malfunction of high voltage electrical systems can result in events such as arc flash incidents which could create high levels of thermal radiation. People exposed to arc flash events can suffer fatal or life changing injuries. Damage to high voltage electrical infrastructure could restrict the ability of the facility to operate and compromise electrical supply to the local area.	There is the potential for a disaster to occur at the Proposed Development which involves accidental damage or malfunction of high voltage electrical equipment. During construction, activities will be carried out to install new electrical connections including a connection to the existing substation site to the immediate south of the Proposed Development OCGT. This work will be very carefully controlled via the CEMP and specific work plans supported by risk assessments. Only suitably qualified and experienced electrical engineers will be allowed to work on high voltage systems, and industry standard safety procedures will be used. Engineers and technicians will manage this work to reduce the risk to a very low level, therefore the risk of a disaster occurring is considered to be low and is not considered further.	N
Accident-- Vandalism / Arson / Terrorism / Cyber Attack	There is the potential for hostile acts against the Proposed Development for example by people opposed to power generation using hydrocarbon fuels. In most instances, these acts would be limited to the potential interruption to operation, minor damage or vandalism. The potential for a significant terrorist incident would be considered as unlikely as the Proposed Development would not be considered as a high-risk target. Cyber security breaches where electronic process control systems are remotely accessed by bad actors for a variety of purposes is an increasing threat, which the Power Generation industry is aware of and takes very seriously by putting systems in place to prevent such breaches.	Vandalism, arson and terrorist activities could cause harm to people on Site, damage to assets and interruption to power generation operations at the Proposed Development. This will be mitigated by implementing security measures including appropriate fencing, CCTV, access control and guards etc. Cyber security systems are designed by expert engineers to prevent unauthorised access to computers on site which provide essential functions for safe operation. The measures described above will reduce the risk associated with vandalism, arson, terrorism and /or cyber-attacks to a low level. Consequently, this scenario is not considered further.	N
Climate Change / Natural Event – Surface Water Flooding	The frequency of storms experienced in the location of the Proposed Development could increase during the lifecycle of the facility as a result of climate change. This could result in, flash flooding due to rainfall, pluvial flooding from surface water and fluvial flooding from rivers.	A Site-Specific Flood Risk Assessment (FRA) Report has been prepared, refer to EIAR Volume II Appendix 12A. The purpose of the FRA is to identify whether a potential risk of flooding exists at the Proposed Development, and if so, to what extent. The conclusion of the FRA is that there is a credible risk of pluvial / fluvial flooding in the location of the Proposed Development. This conclusion will	N

Category	Description	Screening and Identification of Potential Accident / Disaster Scenarios	Included in Assessment (Y/N)
	Flooding could result in damage to site assets such as storage tanks and pipework, with the potential for subsequent loss of containment of HVO, aqueous ammonia or other substances. There is the potential for fires and/ or explosion if HVO releases were ignited, which could have an impact on and off-site.	inform the engineering and environmental design of the Proposed Development, such as the installation of non-return valves on surface water drains. The design and installation of these systems will reduce the risk of an impact caused by flooding to a level which is considered to be ALARP. Consequently, whilst pluvial / fluvial flooding presents a credible risk to the Proposed Development, it will be mitigated by design to reduce the risk of a disaster and therefore this scenario is not considered further within this chapter.	
Climate Change / Natural Event – Coastal Flooding	The frequency of storms experienced in the location of the Proposed Development could increase during the lifecycle of the facility as a result of climate change. This could result in storm surges from the Atlantic Ocean, and increased risk of coastal flooding. Coastal flooding could result in damage to site assets such as storage tanks and pipework, with the potential for subsequent loss of containment of HVO, aqueous ammonia or other substances. There is the potential for fires and/ or explosion if HVO releases were ignited, which could have an impact on and off-site.	A Site-Specific Flood Risk Assessment (FRA) Report has been prepared, refer to EIAR Volume II Appendix 12A. The purpose of the FRA is to identify whether a potential risk of coastal flooding exists at the Proposed Development, and if so, to what extent. The conclusion of the FRA is that there is a credible risk of coastal flooding in the location of the Proposed Development. This conclusion will inform the engineering and environmental design of the Proposed Development, such as the installation of a concrete coastal flood defence wall. The design and installation of these systems will reduce the risk of an impact caused by flooding to a level which is considered to be ALARP. Consequently, whilst flooding presents a credible risk to the Proposed Development, it will be mitigated by design to reduce the risk of a disaster and therefore this scenario is not considered further within this chapter.	N
Climate Change / Natural Event – Increased Ambient Temperatures	The ambient temperatures experienced in the location of the Proposed Development could increase during the lifecycle of the facility as a result of climate change. Increasing atmospheric temperatures could potentially result in the operational instability of equipment such as cooling systems and electrical apparatus such as switchgear, which is sensitive to temperature and humidity. Failure of these systems due to high temperatures could result in operational interruptions at the Proposed Development but would be unlikely to result in harm to people or the environment.	A potential increase in ambient temperatures has the potential to impact the operation and efficiency of the Proposed Development but would be unlikely to cause an incident which has the potential to result in a major accident or disaster. The engineering design of the facilities will take operation at future climatic conditions into account; therefore, this scenario is not considered further within this chapter.	N
Climate Change / Natural Event –	The weather conditions experienced in the location of the Proposed Development could drastically change during the lifecycle of the facility as a result of climate change.	A potential increase in ice storms has the potential to impact the operation and efficiency of the Proposed Development has the potential to cause damage to assets and harm to people.	N

Category	Description	Screening and Identification of Potential Accident / Disaster Scenarios	Included in Assessment (Y/N)
Extreme Cold Weather Conditions	Extreme weather conditions such as ice storms can result in the freezing and subsequent damage of pipework within the Site. Failure of the pipework would result in operational interruptions at the Proposed Development and potentially the release of HVO or aqueous ammonia to the environment. There is the potential for fires and/ or explosion if HVO releases were ignited, which could have an impact on and off-site.	The engineering design of the facilities including de-icing equipment on the air intake structures will take operation at future climatic conditions into account; therefore, this scenario is not considered further within this chapter.	
Climate Change / Natural Event – Increased Wind Speeds	The wind speeds experienced during storms in the location of the Proposed Development could potentially increase during the lifecycle of the facility as a result of climate change. Increasing atmospheric wind speeds could cause tall structures such as chimneys and exhaust vent stacks to become unstable. In a worst-case event, these structures could collapse resulting in harm to people on site, damage to assets and an interruption to operation.	A potential increase in the maximum wind speeds caused by climate change which are experienced at the Proposed Development has the potential to cause damage to assets and harm to people. The structural engineering design of the facilities will calculate wind loading and other requirements based on industry standard guidance and methods. Structural design standards incorporate factors to account for uncertainty, therefore operation at future conditions which include higher wind speeds will be considered. Consequently, a potential disaster involving high winds is not considered further within this chapter.	N
Natural Event – Earthquakes and seismic events	Low magnitude seismic events which are not perceptible to humans occur quite regularly throughout the island of Ireland. The probability for a major event with the potential to cause significant harm however is very low. If a major seismic event were to occur at the Proposed Development, there is the potential to cause harm to people, damage to assets and infrastructure and interrupt power generation operations.	The Irish National Seismic Network records earthquakes on the island of Ireland, however these are predominantly low magnitude events. For example, on 6th May 2010 a magnitude M2.9 earthquake occurred off the west coast of Ireland, approximately 50km north of Tarbert. This event would not have been particularly noticeable on land. The structural engineering design of the facilities will calculate the appropriate loading requirements for seismic factors. This is considered to be suitable mitigation therefore this scenario is not considered further.	N
Natural Event - Lightning strike	A direct lightning strike to the Proposed Development could cause damage to assets and equipment and has the potential to cause harm to people struck by falling objects. There is also the potential that lightning may ignite flammable substances. This could result in a fire causing damage to assets and potentially harm to people on Site.	The engineering design of the Proposed Development will incorporate lightning mitigation. This will be assessed in accordance with recognised industry standards such as EN/IEC 62305. It is expected that this assessment will specify the installation of an appropriate lightning arrestor to be fitted at the highest point on buildings such the turbine building. The exhaust stack would also be expected to be fitted with lightning protection to safely conduct the electrical current to earth in the event of a storm. Consequently, these mitigation measures are considered to be sufficient to reduce risk and this scenario is not considered further.	N

19.6.4 Assessment of Credible Scenarios

The conclusions of the assessment of substances contained in Table 19.1 are that HVO, Distillate Fuel and LPG all have the potential to initiate a credible major accident scenario. HVO and Distillate Fuel are both diesel like fuels with similar properties, and as such the credible major accident scenarios associated with each one are the same. Such credible scenarios comprise of an accidental release into the Shannon Estuary, defined as Risk Event 1; scenarios related to fires and / or explosions, which has been termed Risk Event 2; possibility of a road accident involving an HGV carrying fuel has been termed Risk Event 3. There is a further credible major accident scenario related to LPG which refers to fires and / or explosions, this has been defined as Risk Event 4.

The potential disaster scenarios which are credible for the Proposed Development have been identified in Table 19.2. This assessment has identified one scenario where an incident such as a fire and / or explosion occurring at the NORA controlled Mainland Tank Farm adjacent to the Proposed Development could escalate and have an impact at the new facilities. This 'Domino Effect' scenario has been defined as Risk Event 5.

Risk Events are assessed in further detail within Table 19.3, where the measures which will be taken to prevent and mitigate these are considered.

Table 19.3: Assessment of Major Accident and Disaster Scenarios

Risk Event Ref.	Substance	Scenario Description	Potential Causes and Impacts	Mitigation Measures	Residual Effects
1	HVO and/or Distillate Fuel	Major Release to the Environment	A release of HVO from equipment or pipework could be caused by mechanical failure, impact damage or an operator error resulting in a loss of containment. The most likely impacts resulting from a major loss of containment of HVO are on the environment, should a catastrophic failure of primary, secondary and tertiary containment occur. In such an event, HVO could enter soil, groundwater and Shannon Estuary via local surface water drains. HVO is biodegradable and not toxic to aquatic environments, it is also not soluble enough to form an emulsion with water. However, major releases to the environment could cause formation of a film on the water's surface which can lead to asphyxiation of aquatic life and could cause harm to seabirds if feathers become coated. A distillate fuel release at the on-site TEG facility could escalate to the Proposed Development with similar impacts, however, distillate fuel is also very toxic to aquatic life with long lasting effects, and as such a major release to the environment could cause death to the aquatic life in the Shannon Estuary.	The Proposed Development will include the following mitigation measures which will prevent and minimise the consequences of a release to the environment caused by the accidental loss of containment of HVO and/or Distillate Fuel. - The design will be subject to numerous formal process safety studies to identify and mitigate hazards, such Hazard and Operability (HAZOP) studies. - HVO and Distillate Fuel will be stored in fixed steel tanks (primary containment) which are located within impermeable bunded areas with weather protection (secondary containment sized to contain 110% of the tank volume). The tanks and bunds will be inspected regularly. - The Proposed Development will have a process drains system (tertiary containment), complete with class 1 full retention Oil Water Separators and measures to isolate the surface water to prevent discharge to the environment. This will contain HVO in the event of a failure of primary and secondary containment. - During HVO and Distillate Fuel offloading operations, protective systems will be in place to prevent a loss of containment such as dry-break hose couplings and vehicle chocks to prevent 'drive-away' incidents. - Major pipework sections will be routed below ground where practical to reduce the potential for accidental damage. - The design equipment and pipework will be to industry codes and standards to reduce the potential for a loss of containment, including the use of welded connections to avoid potential leak sources. - Fuel pipework safety systems will be installed along with operational controls and monitoring.	Extensive and robust mitigation measures will be incorporated throughout the design of the Proposed Development to reduce the likelihood of a release of HVO and/or Distillate Fuel. A qualitative risk assessment has been carried out to support the project to consider whether there is an increase in consequence or risk from the proposed modifications associated with the Proposed Development. This study has concluded the level of risk onsite and offsite is acceptable. The residual low risk will be managed by standard operating procedures, safety and environmental management measures to level commensurate with ALARP. Upon decommissioning of the TEG plant, works will be subjected to their own detailed risk assessment which will be adhered to in full to prevent risk of MA&D scenarios occurring. A consequence analysis study was carried out as part of the TLUP (refer to Appendix 19A, EIAR Volume II) for accidental release of HVO. This concluded that the maximum amount of HVO that would breach the tanks bunding would be 2,411m³. This material would then be collected in the drainage system, or in gravelled areas on site. If the worst-case scenario were to occur in which this material is released to the Shannon Estuary, it would cover an area greater than 0.5ha. The recovery period of such

Risk Event Ref.	Substance	Scenario Description	Potential Causes and Impacts	Mitigation Measures	Residual Effects
				- Instrumentation and control systems will continuously monitor the process and leaks causing a loss of pressure would be rapidly detected. - Alarms, both audible and visual, would be raised in the event of a deviation from set points such as pressure levels, alerting site operators. - During commissioning, when HVO will be introduced to the site, detailed method statements, plans and assessments will be produced to carry out these activities' safety. - The Proposed Development will be operated and managed by experienced, highly trained personnel in accordance with all Regulatory requirements, including COMAH. In the event of a HVO and/or Distillate Fuel fire, firewater or foam may be used in firefighting systems. Firewater runoff will be collected in the surface drainage system and tested before being discharged from the Site and therefore the potential for it to cause harm to the environment if released would be low. The foam concentrate used has been developed to be environmentally friendly, therefore if released to the Shannon Estuary, the material will not harm the environment.	an incident is relatively short for shorelines and marshlands, spanning a maximum of 5 years. However, the damages would still be enough to classify it as a Major accident on the Chemical and Downstream Oil Industries Forum (CDOIF). Though, the probability of such an occurrence happening was deemed 1.5×10^{-5} per annum, less than the broadly acceptable figure set by the CDOIF of 10^{-4} per annum (HSA, 2023). The risk of this scenario happening is therefore broadly acceptable.
2	HVO and/or Distillate Fuel	Major Fire and / or Explosion	A release of HVO could potentially arise from the same mechanisms previously described in risk event 1. Ignition of HVO could lead to a major fire. If initiated in one area of the Proposed Development this could have the potential to escalate to other areas such as the fuel storage. Ignition of HVO could also lead to an explosion which could cause harm to people and assets such as equipment and buildings. The impact of a HVO fire and/ or explosion could cause significant harm to personnel on Site, up to the potential for fatal injuries caused by thermal radiation and/or projected	The mitigation measures which will prevent the accidental release of HVO and/or Distillate Fuel have been laid out in the mitigation measures for risk event 1. To prevent and minimise the consequences of a major fire/explosion, the installed electrical and mechanical equipment will be compliant to ensure chances of ignition upon contact with HVO and/or Distillate Fuel are minimized / eliminated. Equipment will be installed as required by Explosives Atmosphere Risk Assessment, to be carried out during the detailed engineering design of the Proposed Development. A comprehensive fire detection and firefighting system will be provided for the Proposed Development as appropriate for the level of fire risk in each part of the Site. A fire protection design basis document containing a fire risk assessment will be	The residual low risk will be managed by standard operating procedures, safety and environmental management measures to level commensurate with ALARP. Upon decommissioning of the TEG plant, works will be subjected to their own detailed risk assessment which will be adhered to in full to prevent risk of MA&D scenarios occurring. The HSA's LUP guidance states that ignition probabilities for flammability Category 3 substances (such as HVO) are zero unless they are in the same bund as Category 1 or 2 substances which

Risk Event Ref.	Substance	Scenario Description	Potential Causes and Impacts	Mitigation Measures	Residual Effects
			debris generated during an explosion. The distance to the nearest residential receptors is such that an incident would be unlikely to have an impact offsite, other than potentially a recommendation by the emergency services to close windows and remain indoors temporarily. A distillate fuel release at the on-site TEG facility could escalate to the Proposed Development with similar impacts.	developed by the appointed Contractor and this will inform the design of the fire system. In the event of a fire, or if HVO is detected within the OCGT enclosures, an alarm will be generated to alert operators. An inert gas (CO₂) fire suppression and purging system will automatically operate to displace air from the enclosure and prevent or extinguish the fire. Fire safety evacuation drills and training to be provided as appropriate.	does not apply to the Proposed Development. In the event of Bund overtopping the released material would be collected in the sites drainage system, as such chances of the material migrating offsite, resulting in a surface spill which could potentially be ignited, is zero.
3	HVO and/or Distillate Fuel	Accident – transport accident to HGVs transporting HVO and/or Distillate Fuel to site or during fuel offloading on site	A release of HVO from HGVs transporting HVO to Site could be caused by the same mechanisms as in risk event 1 but could also be a result of collision with other road vehicles especially when works are being carried out on / near Site where road traffic is likely to increase. The result of which could lead to a major Fire and/or explosion and potentially a major release of HVO to the environment, the details of which have been laid out in risk events 1 and 2. As this could occur offsite this has the potential to impact a wider range of receptors, also this could have the potential to escalate further if ignition of HVO reaches the fuel tanks of other vehicles using the road in the vicinity of the HGV. A Distillate Fuel release due to HGV accident at the on-site TEG facility could cause a fire which could escalate to the Proposed Development with similar impacts.	The mitigation measures to prevent events such as release to environment and/or fires/explosions for HGVs both on and off site are as follows: - The Proposed Development will have dedicated areas for parking and fuel offloading for HGVs. - The contractor will be required to provide detail of any HGV routing in the full Construction Traffic Management Plan. This will consider where deliveries will be made to/from and what roads will be used. - HVO fuel delivery by road will be limited to the hours between 07:00 and 19:00, and no deliveries will take place on Sundays or at night, except in the case of extended emergency operations.	The residual low risk will be managed by standard operating procedures, safety and environmental management measures to level commensurate with ALARP. Upon decommissioning of the TEG plant, works will be subjected to their own detailed risk assessment which will be adhered to in full to prevent risk of MA&D scenarios occurring. A consequence analysis study was carried out as part of the TLUP (refer to Appendix 19A, EIAR Volume II) for environmental release from road tankers for HVO. The chances of failure of containment occurring are 10⁻⁵ per annum, with the highest chance of leakage occurring due to loading/unloading hoses at 4 X 10⁻⁵ per hour. Such events would only have the potential to give rise to environmental damage if the release could also find a pathway to escape off site. However, in each case the release would be to a dedicated kerbed area, designed to retain

					the spill. As such the release would only escape off site if there was a further failure of the operator to correctly manage the drainage system and to discharge the release. The worst-case scenario would be the catastrophic failure of a full road tanker of capacity 36m ³ . This volume would only be classified as a minor event according to the CDOIF. Because of this the associated risk is deemed broadly acceptable.
4	LPG	Major Fire and / or Explosion due to catastrophic rupture of LPG cylinder	A cylinder rupture could be caused by mechanical failure, or an operator error (for example during delivery) resulting in a vapour cloud explosion, jet fire / fireball or flash fire. The impacts would be similar as for Risk Event 2.	Embedded mitigation measure for Risk Events 2 apply. LPG will be delivered by road tanker. Standard operating procedures will be in place to mitigate the risk of cylinder rupture or leak during delivery.	The residual low risk will be managed by standard operating procedures, safety and environmental management measures to level commensurate with ALARP. Results of the consequence analysis for failure of LPG containment systems determined by the chance of failure to be 5x10 ⁻⁷ per annum with a chance of leakage being 1 x10 ⁻⁵ . As such they are deemed broadly acceptable.
5	HFO	Accident - Industrial accident at NORA Mainland Tank Farm	An incident which occurs at the NORA Island Tank Farm has been identified as having the potential to escalate and potentially have an impact at the Proposed Development. This impact includes the potential to increase the duration and severity of an event such as a fire and / or explosion.	The mitigation measures to prevent events such as fire and / or explosion at the NORA Island Tank Farm are as described in risk event 2. These measures are the established systems and controls adopted throughout the power generation industry, which is recognised as having an excellent safety record with a low number of incidents occurring historically in dual fuel turbine generation plants.	COMAH Installations such as the NORA Mainland Tank Farm are required by law to take 'all measures necessary' to prevent major accidents. These principles have been in place at these tanks since operation commenced. The mitigation measures to reduce the risk of a fire and/ or explosion which originates within the Mainland Tank Farm will reduce the residual risk to a low level and will be managed by standard operating procedures, safety and environmental management measures to level commensurate with ALARP.

19.7 Mitigation Measures

The following section contains a summary of the key measures which will be implemented in full to prevent major accidents and disasters at the Proposed Development.

- The CEMP (Appendix 5, EIAR Volume II) will be updated by the Contractor in accordance with any conditions of planning, and similar plans developed for eventual demolition activities.
- The design, construction, and operation of the Proposed Development will be in accordance with international, national and established industry codes, standards and practice, such as the specification of pipework materials, design of structures etc.
- A detailed chemical inventory and risk assessments for all materials handled on-site will be produced in accordance with the requirements of the Chemical Agents legislation.
- All fuels and chemicals stored on-site will be subject to the Safety, Health and Welfare at Work (Chemical Agents) Regulations, as amended by *S.I. No. 231/2021* as well as compliance with the requirements of Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).
- The Proposed Development will comply with the requirements of all relevant health, safety and environmental legislation including COMAH, which requires operators to take all measures necessary to prevent major accidents.
- Regular maintenance and inspection of all facilities will be carried out to reduce the potential for equipment failures which could lead to a loss of containment.
- The existing site Environment Management System (EMS) will be amended to include the Proposed Development. The EMS will set out the requirements and procedures required to ensure that the Proposed Development is operating to appropriate standards. Such Procedures include:
 - Hazardous and polluting liquids such as transformer oils will be stored in tanks located in bunds.
 - HVO fuel unloading bays will be designed to contain spillages.
 - Storage tank level indicators and oil detection sensors in bunds will be provided with alarms.
 - Class 1 full retention Oil Water Separator will be provided in the surface water drainage system.
 - Measures to isolate the surface water drainage system will be provided to prevent discharge of contaminated water.

19.8 Emergency Management

A Site Emergency Response Plan (ERP) will be developed in relation to the Proposed Development in accordance with legislative requirements including COMAH and IE Licence, which will include a fire strategy and appropriate training procedures.

Procedures will be in place to clearly detail the responsibilities, actions and communication channels for operational staff and personnel on how to deal with emergencies should they occur. Staff will also receive the level of training required for their role and position. This will include dealing with events such as fires, spillages, flooding etc. Such measures will be included in the site operating and management system and regulated by EPA through the IE Licence.

The ERP will contain detailed plans for the response to emergencies such as loss of containment of HVO, fires and severe weather events. A stock of emergency equipment such as spill kits will be maintained on Site in particular around the chemical storage areas.

The local Fire and Rescue Service and other key stakeholders will be consulted to provide an input to the development of emergency plans and potentially engage with desktop and live emergency training exercises.

19.9 Cumulative Effects

Cumulative effects relate to the potential effects of the Proposed Development in combination of the potential effects of other developments (referred to as 'cumulative developments') within the surrounding area, as listed in Chapter 4 (Existing Site and Conditions). A summary of cumulative effects pertinent to MA&D is contained in the following section.

19.9.1 Cumulative Effects during Construction

The construction of the Proposed Development is expected be carried out after the existing Tarbert HFO Power Station has finished decommissioning works thus this is not expected to contribute towards any MA&Ds scenarios.

Construction of the Proposed Development may be undertaken at the same time as other developments planned at SSE Tarbert and in the surrounding area. A full list of existing planning applications is included in Chapter 4 (Existing Site and Conditions), which includes the following:

- A Temporary Emergency Generation (TEG) development project consisting of a 150MW OCGT plant will be operating at the SSE Tarbert site. The plant will be located in the south-west portion of the SSE Tarbert site and is expected to operate for five years after which it will be decommissioned and dismantled.

A CEMP has been produced for this project and will incorporate welfare accommodation for the additional construction workers on site, and a number of risk assessments such as traffic management, and control of simultaneous activities on site, both operation and construction works. For example, the placement of temporary cabins used as offices and welfare facilities for the construction workers shall be carefully located to reduce risk from the operational areas.

The potential risks associated with cumulative effects during construction will therefore be reduced and mitigated.

19.9.2 Cumulative Effects During Operation

A credible MA&D scenario has been identified (Risk Event 4) where a major incident occurs at the NORA Island Tank Farm during operation which escalates to areas within the Proposed Development.

As these tanks are COMAH installations it is required by law to take 'all measures necessary' to prevent major accidents, such as the mitigation measures laid out in Risk Events 1 and 2. Thus it can be concluded that the mitigation measures installed at both facilities will be sufficient to reduce the risk of this scenario to a level considered to be ALARP.

As the Proposed Development will be storing large amounts of flammable material it is likely to be a COMAH installation thus it will also be required by law to take 'all measures necessary' to prevent major accidents, such as those set out in Table 19.3. It can be concluded that the mitigation measures installed at both facilities will be sufficient to reduce the risk of this scenario to a level considered to be ALARP. As well as this the existing Tarbert HFO Power Station is already an upper tier COMAH installation that has measures in place to prevent any major accidents.

The Proposed Development, and existing NORA Island Tank Farm will be regulated in accordance with COMAH and will be managed by experienced operating personnel to ensure communication and cooperation in activities thus reducing the potential for accidents.

19.10 Summary

The assessment outlined in this chapter has identified the most likely scenarios which could occur at the Proposed Development that could result in an impact representing a major accident and / or disaster are:

- A loss of containment and subsequent release to the environment caused by accidental damage or failure of the pipework and equipment containing HVO and/or Distillate Fuel (Risk Event 1).
- A loss of containment and subsequent fire and/or explosion caused by accidental damage or failure of the pipework and equipment containing HVO and/or Distillate Fuel (Risk Event 2).
- A loss of containment and subsequent release to the environment and/or fire/explosion caused by accidental damage or failure of the tankers or HGVs transporting HVO and/or Distillate Fuel to the Site (Risk Event 3).
- A loss of containment and subsequent fire and/or explosion caused by accidental damage or failure of the pipework and equipment containing LPG (Risk Event 4).
- A fire and / or explosion which originates at the NORA Mainland Tank Farm which escalates to the Proposed Development (and vice versa) (Risk Event 5).

These events have the potential to cause significant harm to people on The Site if exposed to thermal radiation generated by fires, and / or if in contact with projectiles such as broken glass produced by an

explosion, up to and including the potential for fatal injuries. Operation of the Site in accordance with the highest level of safety standards commensurate with a COMAH site will be the key mitigation to reduce these risks to a level demonstrated to be ALARP.

It is not possible to completely eliminate the risks associated with the use of materials such as HVO. Consequently, the Site will comply with all applicable safety legislation, national and international design standards, industry guidance and other control measures, including those set out in Table 19.3, which will be adopted at the Proposed Development. These mitigating measures have been in place at the existing SSE Tarbert since operation for approximately 50 years and contribute to the excellent safety record at this facility.

Overall, the construction, operation and decommissioning of the Proposed Development is considered 'Not Significant' for Major Accidents and Disasters as all risk events will be mitigated to a level commensurate with ALARP.

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SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 20 Interactions

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November 2023

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Table of Contents

20.	Interactions	20-1
20.1	Introduction	20-1
20.2	Air Quality	20-4
20.3	Cultural Heritage.....	20-6
20.4	Biodiversity	20-7
20.5	Landscape and Visual	20-10
20.6	Noise and Vibration	20-11
20.7	Water Environment	20-12
20.8	Land and Soils	20-13
20.9	Traffic and Transport.....	20-16
20.10	Population and Human Health.....	20-17
20.11	Material Assets	20-20
20.12	Climate.....	20-20
20.13	Waste Management.....	20-21
20.14	Major Accidents and Disasters	20-21
20.15	References	20-21

Tables

Table 20.1:	Summary of Environmental Interactions	20-3

20. Interactions

20.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) describes the potential interaction of effects for which the Proposed Development, may have on the receiving environment and sensitive receptors. Details of contributors to EIAR chapters are provided in Appendix 1B, EIAR Volume II.

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'):

'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 likely direct and indirect significant effects of the Proposed Development in respect of the environmental factors, listed in Article 3(1) of the EIA Directive, have been assessed in detail in the respective chapters in this EIAR.

A summary of the interactions (or inter-relationship) of the likely direct and indirect significant effects of the Proposed Development between the following environmental aspects are outlined in this chapter:

- Air Quality.
- Cultural Heritage.
- Biodiversity.
- Landscape and Visual.
- Noise and Vibration.
- Water Environment.
- Land and Soils.
- Traffic and Transport.
- Population and Human Health.
- Material Assets.

- Climate.
- Waste Management.
- Major Accidents and Disasters (MA&Ds).

All potential effects arising from the interactions were identified early in the design process and in preparation of this EIAR. As a result, any potential effects were either avoided through design measures or have been addressed through specific mitigation and monitoring measures within the respective chapters of this EIAR. No additional mitigation or monitoring measures are proposed in this chapter.

Decommissioning phase effects will be less impactful on the environment than the construction phase. Therefore, it is considered that impact and subsequent effect identified for construction in this assessment will also be representative of potential impacts and effects during the decommissioning phase.

A full description of the existing site and conditions, and the description of the Proposed Development are provided within EIAR Chapters 4 and 5 respectively, and the Planning Statement submitted with this planning application.

A summary of the interaction of effects identified within this chapter is outlined in Table 20.1.

Table 20.1: Summary of Environmental Interactions

Environment Aspect / Interaction	Air Quality		Cultural Heritage		Biodiversity		Landscape & Visual		Noise & Vibration		Water Environment		Land & Soils		Traffic & Transport		Population & Human Health		Material Assets		Climate		Waste Management		Major Accidents & Disasters		
	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	
Air Quality																											
Cultural Heritage	✓	✗																									
Biodiversity	✓	✓	✗	✗																							
Landscape & Visual	✗	✗	✗	✓	✗	✗																					
Noise & Vibration	✗	✗	✓	✗	✓	✓	✗	✗																			
Water	✗	✗	✗	✗	✓	✓	✗	✗	✗	✗																	
Land & Soils	✓	✗	✗	✗	✓	✗	✗	✗	✓	✗	✓	✓															
Traffic & Transport	✗	✓	✓	✗	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓													
Population and Human Health	✓	✗	✗	✗	✗	✗	✗	✗	✓	✓	✗	✗	✓	✗	✓	✗											
Material Assets	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗								
Climate	✓	✓	✗	✗	✓	✓	✗	✗	✗	✗	✓	✓	✓	✗	✓	✓	✓	✓	✗	✗							
Waste Management	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✓	✓				
Major Accidents & Disasters	✗	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✓	✗	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗			

Con:	Construction / Decommissioning Phase	✓ :	Weak / Some / Strong Interaction
Op:	Operation Phase	✗ :	No Interaction

20.2 Air Quality

Air quality interactions are summarised in the following paragraphs and in the relevant sections of this chapter: 20.2.1 Cultural Heritage, 20.2.2 Traffic and Transport, 20.2.3 Climate, 20.2.4 Major Accidents and Disasters. There are no interactions between air quality and the following environmental aspects: water environment; noise and vibration; material assets; landscape and visual; and waste management.

20.2.1 Cultural Heritage

Dust generated from construction and decommissioning phase activities may affect the setting of cultural heritage assets identified within a 1km radius of the Site based on the *Historic England Historic Environment Good Practice Advice in Planning: Note 3 (Second Edition) – The Setting of Heritage Assets* Guidelines.

Chapter 8 Cultural Heritage outlines the possibility of a negative effect to the settings of cultural heritage assets from dust during construction and decommissioning related traffic which has the potential to diminish the condition of the assets. However, this effect will be Short-Term and will cease once the construction or decommissioning phase is complete. During the construction phase, mitigation measures will be in place, as described in the Construction Environmental Management Plan (CEMP) (refer to Appendix 5A, EIAR Volume II), to ensure that heritage sites are protected during construction.

During the operational phase there will be no change to the effects assessed for the recorded cultural heritage assets within the study area due to presence of the Proposed Development.

20.2.2 Traffic and Transport

As outlined in Chapter 7 Air Quality (EIAR Volume I) assessment, it is predicted that the construction and decommissioning phases of the Proposed Development potential effects from vehicle emissions will be below the threshold number of vehicle movements that would trigger a requirement for air quality modelling, under the Transport Infrastructure Ireland (TII) construction screening criteria.

The Heavy-Duty Vehicle (HDV) and Annual Average Daily Traffic (AADT) construction vehicle movements will be below the relevant criteria. Construction traffic will access the Site along the existing public road network, therefore there will be no significant change in air quality from traffic during the construction or decommissioning phases. Therefore, consideration of vehicle effects has been screened out of the assessment.

During the operational phase, additional road traffic emissions will be limited to those associated with vehicle movements for plant maintenance and Hydrotreated Vegetable Oil (HVO) fuel deliveries of maximum 18 arrivals a day and up to 20 light duty vehicles (LDV) arrivals per day for workers.

The increase in traffic movements during the operational phase is not expected to generate additional emissions to the extent that it could contribute to a significant effect on local air quality. As such, the impact of operational road traffic emissions is not considered further in the air quality assessment. Overall, it is concluded that the effect from the traffic arising from the Proposed Development is Not Significant with respect to air quality.

20.2.3 Climate

Chapter 17 Climate outlines the assessment of the effects of the Proposed Development on climate change in respect of greenhouse gas (GHG) emissions and climate resilience. The assessment also considers the impact of climate change on the Proposed Development.

The interaction between climate and air quality is regarding GHG emissions from the Proposed Development and the impact of increased GHG emissions.

During the construction phase GHG emissions were assessed against construction activities such as: embodied carbon of construction products; embodied carbon associated with waste disposal and enabling works; and transport emissions. Construction is estimated to emit approximately 10,399 tonnes of GHG. However, emissions from the construction of the Proposed Development contribute considerably less than 1% of any carbon budget.

During the operational phase GHG emissions were assessed against the GHGs associated with operating and maintaining the Proposed Development, such as: operational emissions are based on a design life of 25 years; fuel and transportation. The total Lifecycle GHGs from operating the Proposed Development over its (at least) 25-year life are estimated to be 1,533,021 tonnes of CO₂ or equivalent. There will be an increase in GHG emissions as a result of the Proposed Development.

However, the Proposed Development will provide support to the electricity supply system at times when other sources of electricity generation are unable to meet grid demand, which will contribute to providing a secure energy supply to the national grid. It is reasonable therefore to view the Proposed Development 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. The Proposed Development including the use of HVO complies with existing and emerging policy requirements and is fully in line with Ireland's trajectory towards low-carbon energy transition.

20.2.4 Major Accidents and Disasters

The construction phase will not result in any likely significant effects on air quality as a result of potential MA&Ds.

During the operational phase the assessment considers the substances present at the Proposed Development, identifying those which are potentially dangerous into the atmosphere. A release of pollutants may result in harm to the environment by discharging into atmosphere.

However, Chapter 19 MA&Ds (EIAR Volume I) identified that the design of the Proposed Development will incorporate appropriate standards and mitigation measures necessary to reduce the risks of accidents and disasters to an acceptable level.

20.2.5 Biodiversity

Air Quality and Biodiversity interactions are summarised in the biodiversity subsection 20.4.

20.2.6 Land and Soils

Air Quality and Land and Soils interactions are summarised in the land and soils subsection 20.8.

20.2.7 Population and Human Health

Air Quality and Population and Human Health interactions are summarised in the population and health subsection 20.10.

20.3 Cultural Heritage

Cultural heritage interactions are summarised in this paragraph and in the relevant sections of this chapter: 20.3.1 Landscape and Visual, 20.3.2 Traffic and Transport. There are no interactions between cultural heritage and the following environmental aspects; population and human health; biodiversity; land and soils; water environment; climate; material assets; waste management; and MA&Ds.

20.3.1 Landscape and Visual

Chapter 8 Cultural Heritage (EIAR Volume I) notes that cultural heritage assets are located both within a 1km and wider settings assessment area up to 5km from the Proposed Development.

The construction phase will not result in any likely significant effects on the existing landscape. The construction of the Proposed Development will tie into the industrial landscape character of the Site. Construction works will be Short-Term and Reversible. Therefore, there will be no likely significant effects on Cultural Heritage assets.

During the operational phase the Proposed Development will include a 55m high emissions stack which could create an impact upon the settings of the heritage assets, particularly Tarbert Lighthouse (RPS-KY-0891) and Light Keeper's House and Bastioned fort (KE003-001).

There is one asset, Kilkerin Fort (RPS 345) located at Lackyle North on a peninsula 2km to the north-east of the Site and will be visible too. It will, initially be partially screened by existing buildings, and blend into the overall existing industrial landscape of the SSE Tarbert site. The change to setting will be such that the special interests or qualities of Kilkerin Fort (RPS 345) will have a Low impact.

20.3.2 Traffic and Transport

The cultural heritage impact assessment considers all recorded cultural heritage assets within the study area.

During the construction phase there is the potential to impact cultural heritage assets from the dust, noise and vibration associated with construction traffic. However, the additional traffic during construction will be temporary. The possibility of adverse effects to cultural heritage assets from construction traffic related to dust, noise and vibration, will be Short-Term and Slight. The mitigation measures in the CEMP will ensure that any cultural heritage assets are protected during construction (refer to Appendix 5A, EIAR Volume II.)

During the operational phase, traffic impacts associated with the Proposed Development will be Low and will have a Negligible effect on cultural heritage assets.

20.3.3 Noise and Vibration

Cultural Heritage and Noise and Vibration interactions are summarised in Section 20.6.

20.4 Biodiversity

Biodiversity interactions are summarised in the following paragraphs and in the relevant sections of this chapter: 20.4.1 Air Quality, 20.4.2 Noise and Vibration, 20.4.3 Water Environment, 20.4.4 Land and Soils, 20.4.5 Traffic and Transport, 20.4.6 Climate, 20.4.7 Waste Management and 20.4.8 Major Accidents and Disasters. There are no interactions between biodiversity and the following environmental aspects: landscape and visual; population and human health; material assets; and cultural heritage.

20.4.1 Air Quality

In accordance with the 'Guidance on the Assessment of Dust from Demolition and Construction Activities' published by the Institute of Air Quality Management (IAQM) (2023), the screening criteria for ecological receptors is 50m from the boundary of the Site. The trackout distance is 50m from construction traffic routes and up to 500m from the construction site entrance(s).

Fifteen sensitive nature conservation site receptors have been selected to adequately represent various habitats across the Lower River Shannon Special Areas of Conservation (SAC) and sections of the River Shannon and River Fergus Estuaries Special Protection Area (SPA), within 15km of the Proposed Development.

During the construction phase the air quality assessment determined that there will be Negligible effect on biodiversity.

During the operational phase, the numbers of vehicles will be below that of the construction phase, therefore, an operational phase assessment has been screened out.

The impact of airborne pollution emissions during the operational phase was assessed. With respect to the Appropriate Assessment (AA) / Natura Impact Statement (NIS) (submitted with this EIAR and application), a total of 15 No. modelling points were selected to provide predictions for airborne pollution at habitat locations within the European sites that are within 15km of the Proposed Development (*i.e.*, Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA). The air quality modelling determined that airborne pollution will not result in any Adverse effects on the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA or any other ecological receptors.

20.4.2 Noise and Vibration

Protected / notable species within the study area were assessed for their potential to be affected by noise and vibration during the construction, operational and decommissioning phases.

Acoustic modelling was also carried out to predict the noise levels which could be generated at various receptor locations due to construction, operational and decommissioning activities.

A total of three noise modelling locations were selected to inform the AA / NIS (submitted with this application). The locations of these points were selected with cognisance of the potential distribution of special conservation interest (SCI) species both within and outside of the boundary of the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA, and to consider distribution of SCI birds within the Site based on the results of the non-breeding bird surveys.

Full details of the noise modelling are provided in Chapter 11 Noise and Vibration (EIAR Volume I). Although noise levels will be elevated during construction works in habitats within the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA, the noise levels will quickly be within the range at which waterbirds are expected to become habituated, this is explained in further detail in the NIS (refer to Appendix 9B, EIAR Volume II). Should disturbance of waterbirds occur, displacement is therefore only likely from the area immediately around the Proposed Development. This has no potential to prevent the Conservation Objectives of the SAC and SPA being met, namely there will be no material change to the distribution of SCI species, nor any impact on the population trends of these species. With the inclusion of the mitigation measures outlined in the AA / NIS, any disturbance levels will be decreased even further than the levels outlined above, thus making an adverse effect on Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA even more unlikely.

The predicted noise levels during the operational phase determined that the disturbance of waterbirds is very unlikely. Noise generated during the operational phase will be constant (when in use), and it is highly likely that birds will become habituated to these noise levels (as is the case with the existing Tarbert HFO Power Station) (refer to the NIS, Appendix 9B, EIAR Volume II). There is not expected to be any disturbance on birds using this area for these reasons and with the addition of mitigation detailed in the NIS.

Similarly, Chapter 9 Biodiversity, concluded that there will be Negligible effects on bats, badger, otter and breeding birds.

20.4.3 Water Environment

In the absence of control measures any impacts to surface water features, during the construction and operational phases, may in turn impact the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA, given their proximity to the Site.

Chapter 12 Water Environment (EIAR Volume I) sets out the mitigation measures with respect to the protection of surface water features from accidental spills and leaks, sedimentation and the use of concrete and lime during the construction, operational and decommissioning phases.

With the implementation of the mitigation measures outlined in this EIAR and NIS, there will be no significant adverse effects on surface water features or biodiversity as a result of the Proposed Development.

20.4.4 Land and Soils

During the construction phase there will be a minor loss of habitat (recolonising bare ground) to facilitate the construction of the Proposed Development. There may also be a minor loss of small areas of grassy verges to facilitate the construction works. There will no loss of treelines or scrub. The recolonising bare ground is of relatively low quality and therefore any loss of this habitat type is considered Not Significant.

During the construction phase there is the potential for accidental spills and leaks, sedimentation and the use of concrete and lime which could potentially impact soils and groundwater underlying the Site and biodiversity habitats.

However, mitigation measures with respect to the protection of land from accidental spills and leaks are set out in Chapter 13 Land and Soils and the CEMP (refer to Appendix 5A). The lands and soils assessment determined that there will be no likely significant effects on biodiversity or habitats as a result of the Proposed Development.

During the operational phase, there will be no likely significant effects on biodiversity as a result of the Proposed Development

20.4.5 Traffic and Transport

During the construction phase there is potential for noise and airborne / dust pollution impacts generated by construction traffic on a range of ecological features e.g., the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA and habitats / species within the Site which are outlined in Chapter 9 Biodiversity. However, construction activities associated with the Proposed Development are unlikely to generate substantial quantities of dust. Moreover, mitigation measures will be implemented to minimise dust generation, as outlined in CEMP, Appendix 5A, EIAR Volume II.

During the construction and operational phases, traffic associated with the Proposed Development has the potential to result in negative effects on biodiversity, potentially resulting in severance, disturbance and mortality impacts. However, the existing Tarbert HFO Power Station has operational traffic on-site, which all species are habituated to.

Therefore, there will be no likely significant effects as a result of traffic and transport on biodiversity.

20.4.6 Climate

Chapter 17 Climate outlines the assessment of effects of the Proposed Development on climate in respect of GHG emissions and climate change resilience (CCR). The assessment also considers the impact of climate change on the Proposed Development.

The potential risks to biodiversity may be exacerbated by climate change during the construction and operational phases mostly by exposure to climate change risk. Climate change risk includes coastal flooding due to the proximity of the Proposed Development to the coast and the sea level rise projections based on climate change effects.

However, embedded mitigation measures for the Proposed Development will result in No Significant effects in relation to combined impacts to biodiversity.

20.4.7 Waste Management

In the absence of control measures demolition and construction (C&D) waste arisings, including hazardous waste, may in turn impact biodiversity and the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA given their proximity to the Site.

During the construction phase there is the potential for C&D waste to impact the local environment and watercourses if the waste is not management and stored correctly. During construction hazardous waste arisings will occur, but are expected to comprise small quantities of oils, chemicals and similar materials typically used as part of construction activities.

Mitigation measures for C&D waste management are set out in Chapter 18 Waste Management, the CEMP and the Resource and Waste Management Plan (RWMP) (refer to Appendix 5A and 18A respectively).

During the operational phase the Proposed Development will generate small quantities of waste from the offices, including paper and packaging. Small quantities of oils and chemicals will also be required on-site (including lubrication oils, propane, ammonia, general oils, canisters from gases stored on-site). However, the operational phase waste is considered Not Significant.

With these mitigation measures in place there will be no likely significant effect on biodiversity from C&D waste materials.

20.4.8 Major Accidents and Disasters

The assessment considers the substances present at the Site, identifying those which are potentially dangerous, such as flammable materials and substances toxic to human health and / or the environment. A release of pollutants, for example, contaminated firewater, may result in harm to the environment by discharging into Shannon Estuary SAC and River Shannon and River Fergus Estuaries SPA or surrounding land.

However, Chapter 19 MA&Ds (EIAR Volume I) identified that the design and operations of the Proposed Development will incorporate appropriate standards and mitigation measures necessary to reduce the risks of accidents and disasters to an acceptable level.

As such, it is concluded that these events are very unlikely to occur and therefore there are no expected positive or negative interacting effects between MA&Ds and environmental receptors such as biodiversity and water.

20.5 Landscape and Visual

Landscape and visual interactions are summarised below and in the relevant sections of this chapter: 20.5.1 Traffic and Transport. There are no interactions between landscape and visual and the following environmental aspects; biodiversity; population and human health; land and soils; water environment; air quality; climate; noise and vibration; material assets; waste; and MA&Ds.

20.5.1 Traffic and Transport

During the construction phase road closures, potential traffic management, and signage have the potential to have an effect upon the local landscape and views towards the Site. Machinery and material movements related to excavations and earthworks will result in temporary landscape and visual effects within the study area during the construction phase. However, visibility diminishes quickly with distance from the Site due to intervening, compound boundaries, vegetation, topography and / or existing structures on the Site. The construction phase will not result in any likely significant effects on the existing landscape.

During the operational phase, traffic volumes will be low and there will be Negligible effects on the landscape and visual elements of the Proposed Development study area.

20.6 Noise and Vibration

Noise and vibration interactions are summarised below and in the relevant sections of this chapter: 20.6.1 Cultural Heritage and 20.6.2 Traffic and Transport. There are no interactions between noise and vibration and the following environmental aspects; water environment; air quality; climate; material assets; landscape and visual; waste management and MA&Ds.

20.6.1 Cultural Heritage

Chapter 8 Cultural Heritage notes that heritage assets are located within 1km of the Proposed Development. There is the potential for negative effects to the setting of these assets from construction phase noise and vibration, as a result of traffic and on-site construction activities which could potentially diminish the importance of these assets.

However, the construction phase impact will be Short-Term and will cease once construction is complete. During the construction phase, mitigation measures will be in place, as described in the CEMP (refer to Appendix 5A, EIAR Volume II), to ensure that the heritage sites are protected.

During the operational phase there will be no change to the effects assessed for the designated assets within the study area due to the permanent presence of the Proposed Development.

20.6.2 Traffic and Transport

Chapter 14, Traffic and Transport, determines that the construction traffic will travel to and from the Site via the N69 and N67 National roads. The transport assessment finds that construction traffic will lead to an increase in the number of vehicles using the N69 and N67 roads. However, the assessment determined that there will be no likely significant effect on existing road traffic noise levels during the construction phase. The calculated increases in levels are defined as Imperceptible and Temporary. A Construction Traffic Management Plan (CTMP) has been prepared as part of the EIAR, refer to Appendix 14B, Volume II.

During the operational phase, there will be a high degree of automation with the Proposed Development. The Proposed Development will be controlled centrally from the proposed administration building on the SSE Tarbert site, therefore the traffic associated with operational personnel and fuel deliveries will be Not Significant. There will be a small increase in the number of personnel accessing the Site for routine maintenance / overhaul. Overall, during the operational phase traffic impacts have been assessed as Negligible.

The impacts of operational traffic during the operational phase of the Proposed Development, are defined as Not Significant.

20.6.3 Land and Soils

Noise and Vibrations and Land and Soils interactions are summarised in Section 20.8.

20.6.4 Population and Human Health

Noise and Vibrations and Population and Human Health interactions are summarised in Section 20.10.

20.7 Water Environment

Water interactions are summarised in the following paragraphs and in the relevant sections of this chapter: 20.7.1 Traffic and Transport, 20.7.2 Climate, 20.7.3 Waste Management and 20.7.4 Major Accidents and Disasters. There are no interactions between water and the following environmental aspects; population and human health; air quality; noise and vibration; material assets; cultural heritage; and landscape and visual.

20.7.1 Traffic and Transport

During the construction phase, there is the potential for accidental spillage or leakage of oils and fuels from construction machinery or site vehicles. This has the potential to impact on water and groundwater underlying the Site if inappropriately handled or stored.

A CTMP and CEMP (refer to Appendix 14B and Appendix 5A respectively, EIAR Volume II) have been prepared as part of this planning application, to mitigate negative impacts on the environment during the construction phase.

Similarly, during the operational phase there is the potential for accidental spills and leaks to occur from vehicles accessing the Site. Potential contaminants could migrate through the subsoils and impact water and underlying groundwater.

Mitigation measures are outlined in Chapter 9 Biodiversity, Chapter 13 Land and Soils and Chapter 12 Water Environment, in addition to control measures that have been included in the design. These mitigation measures will minimise the potential for any adverse effects to creating water pollution during the construction, operational and decommissioning phases.

20.7.2 Climate

Chapter 17 Climate outlines the assessment of the effects of the Proposed Development on climate in respect of GHG emissions and climate change resilience (CCR). The assessment also considers the impact of climate change on the Proposed Development.

There is a potential interaction between water and climate with regard to flooding, based on a future climate change scenario. The Proposed Development falls within Flood Zone A for tidal / coastal flooding, meaning there is a high probability of coastal flood events within the Site boundary. A Site-Specific Flood Risk Assessment (FRA) has been undertaken and the impact of the Proposed Development, taking into account the climate change scenario (refer to Appendix 12A, EIAR Volume II). The FRA has recommended a flood defence scheme of +4.8mAOD to adequately protect the Site.

20.7.3 Waste Management

Waste has the potential to impact waterbodies if waste is incorrectly stored or managed and from the excavation and reuse / disposal of shallow made ground and soils. In the absence of control measures construction waste arisings including hazardous wastes may in turn impact waterbodies.

Uncontained spillage of wastewater effluent and / or runoff from chemical and waste storage or handling areas has the potential to impact the water environment during the construction phase.

Mitigation measures with respect to the protection from accidental spills and leaks, sedimentation and the use of concrete and lime are set out in Chapter 13 Land and Soils, Chapter 18 Waste Management, the CEMP and the RWMP (refer to Appendix 5A and 18A respectively, EIAR Volume II).

During the operational phase, HVO will be delivered to the Site and oils and chemicals will be stored on the Site, necessary for the operation of Proposed Development. Such oils and chemicals may result in small quantities of operational waste. The process wastewater from the production of demineralised water will contain the naturally occurring minerals removed from the mains water. Wastewater will be treated to adjust the pH to neutral range before discharge to the surface water drainage system, and ultimately to sampling point SE3 / outfall 8 and 9. Wastewater will also be generated from blade washing but will be collected and stored in a dedicated drain tank on-site and will periodically be disposed offsite by a road tanker in compliance with the Waste Management Act 1996. Operational waste impacts from the Proposed Development are expected to be Negligible and will be confined to occasional disposal, maintenance, and repair.

20.7.4 Major Accidents and Disasters

During the operational phase, the MA&Ds assessment considers the substances present at the Site, identifying those which are potentially dangerous, such as flammable materials and substances toxic to human health and / or the environment. A release of pollutants, for example, contaminated firewater, may result in harm to the environment by discharging into the River Shannon estuary or surrounding environment.

However, Chapter 19 MA&Ds (EIAR Volume I) identified that the design of the Proposed Development will incorporate appropriate standards and mitigation measures necessary to reduce the risks of accidents and disasters to an acceptable level.

As such, these events are very unlikely to occur and therefore there are no expected positive or negative interacting effects between MA&Ds and environmental receptors such water and groundwater.

20.7.5 Land and Soils

Water and Land and Soils interactions are summarised in Section 20.8.

20.8 Land and Soils

Land and Soils interactions are summarised below and in the relevant sections of this chapter: 20.8.1 Air Quality, 20.8.2 Noise and Vibration, 20.8.3 Water Environment, 20.8.4 Traffic and Transport, 20.8.5 Climate, 20.8.6 Waste Management and 20.8.7 Major Accidents and Disasters. There are no interactions between land and soils and the following environmental aspects; material assets; cultural heritage; and landscape and visual.

20.8.1 Air Quality

During the construction phase, excavation, earthworks, temporary stockpiling of soil will be carried out during the works. Stockpiles have the potential to cause negative impacts on local air quality.

Dust suppression measures (e.g., damping down during dry periods), vehicle wheel washes, road sweeping, and general housekeeping will ensure that the surrounding environment are free of nuisance

dust and dirt on roads. Mitigation measures are also outlined in Chapter 7 Air Quality and the CEMP, refer Appendix 5A, EIAR Volume II. However, a low risk of dust impacts was identified due to the potential dust emission magnitude and the sensitivity of the area.

During the operational phase, no impacts to land and soils are anticipated.

20.8.2 Noise and Vibration

During the construction phase, excavation, earthworks, and temporary stockpiling of soil will be carried out. Construction phase activities, including the movement of materials on-site can result in noise and vibration impacts to sensitive receptors surrounding the Site. Mitigation measures are outlined in Chapter 11 Noise and Vibration and the CEMP (refer to Appendix 5A). However, No Significant Adverse effects are expected at sensitive receptors.

During the operational phase, no impacts to land and soils are anticipated.

20.8.3 Water Environment

During the construction phase, excavation, earthworks, and temporary stockpiling of soil will be carried out. These activities have the potential to release sediment into the catchment area and cause negative impacts on water quality. It is anticipated that low levels of stockpiling will occur as the bulk of the material will be excavated either straight into trucks for transport offsite or reused in other areas around the Site.

Excavation and infilling impacts will result in a permanent negative effect. This is considered to be a Medium effect on a soil and groundwater environment. During the operational phase, process wastewater and wastewater will be generated. The process wastewater will be discharged to the surface water drainage system.

During the operational phase, there is also the potential for an increase in the volume and rate of surface water run-off from new impervious areas, leading to an impact on flood risk, upstream and downstream of the Site. Impacts on receiving waterbodies from anthropogenic pollutants in surface water run-off (including accidental distillate fuel spillages from tanks and pipelines) are considered a direct negative impact, but unlikely to occur with the embedded mitigation measures, including bunding of fuel tanks and inclusion of interceptors within the drainage system.

Mitigation measures with regard to the protection of soil, groundwater and surface water quality during both the construction and operational phases are outlined in Chapter 12 Water Environment and will be applicable to Chapter 13 Land and Soils.

The implementation of mitigation measures will significantly reduce the likelihood and magnitude of the potential impacts on the water environment during the construction, operational and decommissioning phases.

20.8.4 Traffic and Transport

During the construction phase, there is the potential for accidental spillage or leakage of oils and fuels from construction machinery or vehicles. This has the potential to impact on soils and groundwater underlying the Site if inappropriately handled or stored.

A CTMP and CEMP (refer to Appendix 14B and 5A respectively, EIAR Volume II) have been prepared as part of this planning application to mitigate negative impacts on the environment during the construction phase.

Similarly, during the operational phase there is the potential for accidental spills and leaks to occur from vehicles accessing the Site. Potential contaminants could migrate through the subsoils and impact underlying groundwater.

During the operational phase, the Proposed Development will run on HVO. The HVO will be delivered to Site by road in HDV tankers. Deliveries of HVO will be by road and will be stored on-site in proposed tanks before being pumped to its operating destination within the Site.

Mitigation measures will significantly reduce the likelihood and magnitude of the potential impacts on the water environment during the construction, operational and decommissioning phases. The magnitude of impact relating to the accidental pollution by spillages is considered likely to decrease from Slight Adverse to Negligible.

The implementation of mitigation measures will significantly reduce the likelihood and magnitude of the potential impacts on the land and soils during the construction, operational and decommissioning phases.

20.8.5 Climate

Chapter 17 Climate outlines the assessment of the effects of the Proposed Development on climate change in respect of greenhouse gases emissions and climate resilience. The assessment also considers the impact of climate change on the Proposed Development.

There will be unavoidable GHG emissions resulting from the construction phase and operational phase of the Proposed Development. However, embedded mitigation measures for the Proposed Development means that there are not predicted to be any significant effects in relation to land and soils.

20.8.6 Waste Management

Waste has the potential to impact soils and groundwater if waste is incorrectly stored or managed and with regard to the excavation and reuse / disposal of shallow made ground and soils. In the absence of control measures construction waste arisings including hazardous wastes may in turn impact on soils and groundwater.

Uncontained spillage of wastewater effluent and / or runoff from chemical and waste storage or handling areas impacting on soils and groundwater during the construction phase.

Mitigation measures with respect to the protection from accidental spills and leaks, sedimentation and the use of concrete and lime are set out in Chapter 13 Land and Soils, Chapter 18 Waste Management and the CEMP and the RWMP (refer to Appendix 5A and 18A respectively, EIAR Volume II).

During the operational phase HVO will be delivered to the Site and oils and chemicals will be stored on-site, necessary for the operation of Proposed Development. Such oils and chemicals may result in small quantities of operational waste. However, operational waste impacts from the Proposed Development are expected to be Negligible.

Mitigation measures will significantly reduce the likelihood and magnitude of the potential impacts on land and soils during the construction, operational and decommissioning phases. The magnitude of impact relating to the accidental pollution by spillages is considered likely to decrease from Slight Adverse to Negligible.

20.8.7 Major Accidents and Disasters

During the operational phase, the MA&Ds assessment considers the substances present at the Site, identifying those which are potentially dangerous, such as flammable materials and substances toxic to human health and / or the environment. A release of pollutants could result in harm to the environment by discharging into the River Shannon estuary or surrounding environment.

However, Chapter 19 MA&Ds (EIAR Volume I) identified that the design of the Proposed Development will incorporate appropriate standards and mitigation measures necessary to reduce the risks of accidents and disasters to an acceptable level.

As such, these events are very unlikely to occur and therefore there are no expected positive or negative interacting effects between MA&Ds and environmental receptors such as land, soils and groundwater.

20.8.8 Population and Human Health

Land and Soils and Population and Human Health interactions are summarised in Section 20.10.

20.9 Traffic and Transport

Traffic and transport interactions are summarised below and in the relevant sections of this chapter: 20.9.1 Waste Management and 20.9.2 Major Accidents and Disasters. There are no interactions between traffic and transport and the following environmental aspect: material assets.

20.9.1 Waste Management

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. The interaction between traffic and transport and waste is associated with the disposal of waste.

A CTMP, CEMP and RWMP (Appendix 14B, 5A and 18A respectively, EIAR Volume II) have been prepared to mitigate negative impacts on the environment during the construction phase. As a result of the implementation of mitigation, significant residual impacts from material imports and exports on construction traffic will not arise.

During the operational phase, HVO will be delivered to the Site as well as other oils and chemicals necessary for the operation of Proposed Development. Such chemicals may result in small quantities of operational waste. Similarly, the operational phase will generate small quantities of waste from the offices, including paper and packaging. However, operational waste impacts from the Proposed Development are expected to be Negligible.

20.9.2 Major Accidents and Disasters

Due to the nature and size of the Proposed Development there is a risk of an abnormal or heavy load falling from its transport vehicle onto the road network in the event of a collision or crash. The CTMP

(Appendix 14B, EIAR Volume II) predicts that all construction traffic associated with the Proposed Development (heavy haul, general delivery and site operatives) will arrive via the N67 and N69.

During the operational phase, the MA&Ds assessment considers the substances present at the Site, identifying those which are potentially dangerous. HVO will be delivered to the Site by road in HDV tankers. During the operational phase, there will be limited vehicle movements associated with the supply of HVO for the Proposed Development. The traffic and transport assessment has determined that the operational traffic volumes will be Not Significant.

As such, these events are very unlikely to occur also due to the mitigation measures in place and therefore there are Negligible expected positive or negative interacting effects between MA&Ds and environmental receptors such traffic and transport.

20.9.3 Population and Human Health

Traffic and Transport and Population and Human Health interactions are summarised in Section 20.10.

20.9.4 Climate

Traffic and Transport and Climate interactions are summarised in Section 20.12.

20.10 Population and Human Health

Population and human health interactions are summarised in the following section and in the relevant sections of this chapter: 20.10.1 Air Quality, 20.10.2 Noise and Vibration, 20.10.3 Land and Soils, 20.10.4 Traffic and Transport, 20.10.5 Climate, 20.10.6 Waste Management and 20.10.7 Major Accidents and Disasters. There are no interactions between population and human health and the following environmental aspects; biodiversity; water; material assets; cultural heritage; and landscape and visual.

20.10.1 Air Quality

Construction phase activities and traffic may result in temporary air quality and neighbourhood amenity effects. Pollution caused by traffic has the potential to cause negative impacts on local air quality, if not mitigated. However, the risk of dust impacts occurring during construction is assessed to be a low risk to human health, due to the limited number of receptors near dust sources. Mitigation measures are outlined in Chapter 7 Air Quality and the CEMP (Appendix 5A, EIAR Volume II). With these mitigation measures in place there will be no likely significant effect on human health from construction phase dust.

During the operational phase, it is expected that the Proposed Development will not result in any significant changes to the local air quality. During the operational phase the traffic impacts associated with the Proposed Development will Not be Significant.

20.10.2 Noise and Vibration

Construction phase activities have the potential to result in temporary noise and vibration impacts on receptors within the vicinity of the Site. However, the noise and vibration assessment has determined that there will be No Significant Adverse effects at residential receptors provided mitigation measures are implemented.

An assessment of noise generation caused by construction traffic was carried out. The assessment predicts that there will be No Significant effects due to the presence of construction phase traffic.

An assessment of noise generation caused by the operations of the Proposed Development was carried out. The assessment concluded that two NSR will be compliant, and the effects are considered Not Significant. However, there will be a night-time noise criterion exceedance at one NSR. Mitigation measures will be implemented to reduce any impacts on the nearby receptors. Post mitigation, No Significant residual impacts are expected.

20.10.3 Land and Soils

The quality of the local environment can have a significant impact on the physical and mental health of the local population.

During the construction phase, excavation, earthworks, and temporary stockpiling of soil will be required. Stockpiles have the potential to cause negative impacts on air and water quality. However, a CEMP has been prepared (Appendix 5A, EIAR Volume II), to ensure that there will be no impacts on any vector that would pose a risk to human health.

During the operational phase no impacts to population and human health are anticipated.

20.10.4 Traffic and Transport

The study area of the Proposed Development is predominantly rural with limited public transport available. Local residents rely heavily on the local and regional road network. During the construction phase, HDV traffic, general delivery traffic and site operatives will all be required to travel to and from the Site. The construction phase is predicted to last up to 29 months.

The construction traffic will travel to and from the Site via the N67 and N69. The traffic assessment has concluded that the N67 and N69 can adequately facilitate construction traffic accessing the Site. The potential impact of construction traffic will be Temporary.

The transport assessment notes that construction traffic will lead to an increase in the number of vehicles using these two roads. The assessment concludes that the construction traffic congestion will not be considerable enough to deter local residents from accessing workplaces, educational facilities, or community facilities. A CTMP has been prepared as part of this planning application, refer to Appendix 14B, EIAR Volume II.

During the operational phase, the Proposed Development will not have a likely significant effect on the local residents in the community, due to the estimated low volume of operational traffic associated with the Proposed Development.

20.10.5 Climate

Chapter 17 Climate outlines the assessment of the effects of the Proposed Development on climate change in respect of GHG emissions and climate resilience. The assessment also considers the impact of climate change on the Proposed Development.

During the construction phase GHG emissions were assessed against construction activities such as: embodied carbon of construction products; embodied carbon associated with waste disposal and

enabling works; and transport emissions. Construction is estimated to emit approximately 10,399 tonnes of GHG. The impact of the Proposed Development in terms of climate change as a determinant of human health and well-being during construction is assessed to be Negative (-).

During the operational phase GHG emissions were assessed against the GHGs associated with operating and maintaining the Proposed Development, such as: operational emissions are based on a design life of 25 years; fuel and transportation. The total Lifecycle GHGs from operating the Proposed Development over its (at least) 25-year life are estimated to be 1,533,021 tonnes of CO₂ or equivalent. There will be an increase in GHG emissions as a result of the Proposed Development.

The impact of the Proposed Development in terms of climate change as a determinant of human health and well-being during operation is assessed to be Negative (-), however Not Significant when considering the ability of Ireland to achieve its stated net zero pathway.

20.10.6 Waste Management

Waste has the potential to effect human health, if incorrectly stored or managed. In addition, incorrect management of waste can result in littering that can cause a nuisance to the public and attract vermin.

A RWMP (Appendix 18A, EIAR Volume II), will ensure appropriate management of waste and avoid any significant adverse effects on the local population during the construction phase.

During the operational phase oils and chemicals will be necessary for the operation of Proposed Development. Such oils and chemicals may result in small quantities of operational waste. However, operational waste impacts from the Proposed Development are expected to be Not Significant.

20.10.7 Major Accidents and Disasters

Construction activities include works required to connect electrical power generated at high voltage (HV) at the Proposed Development to the transmission system via equipment such as transformers and switchgear. There are hazards associated with HV electricity, particularly during construction when work is carried out at or near to overhead power lines and underground cables. Contact with HV electricity can cause fatal injuries therefore must be carefully managed to control risks. An accident which causes an interruption to the supply of electricity to local residents and businesses could be within the criteria for a MA&Ds event.

A comprehensive Health & Safety (H&S) programme will be implemented to minimise any risks to and ensure the health and safety of construction personnel, site visitors and any local residents. The Proposed Development will comply with all H&S Regulations during the construction phase.

During the operational phase, the assessment considers the substances present at the Proposed Development, identifying those which are potentially dangerous, such as flammable materials and substances toxic to human health and / or the environment. A Site Emergency Response Plan (ERP) will be developed in relation to the Proposed Development in accordance with legislative requirements including COMAH and IE Licence, which will include a fire strategy and appropriate training procedures.

Chapter 19 MA&Ds identified that the design of the Proposed Development will incorporate appropriate standards and mitigation measures necessary to reduce the risks of accidents and disasters to an

acceptable level. As such, these events are very unlikely to occur and therefore there are no expected positive or negative interacting effects between MA&Ds and human / environmental receptors.

20.11 Material Assets

There are no Material Assets interactions with the other environmental effects.

20.12 Climate

Climate interactions are summarised below and in the relevant sections of this chapter: 20.12.1 Traffic and Transport and 20.12.2 Waste Management. There are no interactions between climate and the following environmental aspects; noise and vibration; material assets; cultural heritage; landscape and visual and climate.

20.12.1 Traffic and Transport

The interaction between climate and traffic and transport is regarding GHG emissions from traffic movements and the impact these increased emissions will have.

During the construction phase GHG emissions were assessed against construction activities such as transport emissions. The transport assessment notes that construction traffic will lead to an increase in the number of vehicles using the N67 and N69 roads. Construction materials transport emissions have been calculated based on the estimated daily traffic generation and are assumed to be a 50km round trip. However, there will be no significant effect between traffic and transport and climate during the construction, as the construction phase will be Short-Term, and the CEMP will outline mitigation measures to offset any effects.

During the operational phase, additional road traffic emissions will be limited to those associated with vehicle movements for plant maintenance and other deliveries. The increase in traffic movements during the operational phase is not expected to generate additional emissions to the extent that it could contribute to significant GHG emissions from traffic.

20.12.2 Waste Management

The interaction between waste and climate is regarding GHG emissions associated with the disposal of waste during the construction phase.

The GHG assessment has determined that the fuel associated with the disposal of construction waste was assumed to be 10% of fuel used for the transport of materials, construction plant and machinery. A CTMP, CEMP and RWMP (Appendix 14B, 5A and 18A respectively, EIAR Volume II) have been prepared to mitigate negative impacts on the environment during the construction phase.

During the operational phase, small quantities of oils and chemicals will also be delivered to the Site. The oils and chemicals may result in small quantities of operational waste. During the operational phase some process wastes to be exported from the Site and general waste from the buildings. However, operational waste impacts from the Proposed Development are assessed to be Not Significant.

20.13 Waste Management

The interactions between waste management and other environmental aspects have been discussed in the sections above: 20.4 Biodiversity, 20.7 Water Environment, 20.8 Land & Soils, 20.9 Traffic & Transport, 20.10 Population and Health and 20.12 Climate. There are no interactions between waste management and the following environmental aspects: air quality; cultural heritage; landscape and visual; noise and vibration; material assets and MA&Ds.

20.14 Major Accidents and Disasters

The interactions between MA&Ds and other environmental aspects have been discussed in the sections above: 20.2 Air Quality; 20.4 Biodiversity, 20.7 Water Environment, 20.8 Land and Soils, 20.9 Traffic and Transport and 20.10 Population and Human Health. There are no interactions between MA&Ds and cultural heritage, landscape and visual, noise and vibration, waste management and climate.

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SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 21 Summary of Mitigation

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Table of Contents

21.	Summary of Mitigation	21-1
21.1	Introduction	21-1
21.2	References	21-13

Tables

Table 21.1:	Description of Nature of Effects.....	21-2
Table 21.2:	Summary of Significant Environmental Effects	21-4
Table 21.3:	Schedule of Environmental Commitments	21-10

21. Summary of Mitigation

21.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) outlines the conclusions of the technical assessments on the Proposed Development. This chapter includes a summary of those adverse and beneficial environmental effects described throughout each of the technical chapters (Chapters 7 to 19) of this EIAR, which will be implemented during the demolition, construction, operational and decommissioning phases of the Proposed Development, refer to Table 21.2.

This chapter also presents a Schedule of Environmental Commitments presented in Table 21.3 which summarises all the impact avoidance, mitigation, and enhancement measures that the Applicant is committed to delivering as part of the Proposed Development.

21.1.1 Summary of Significant Environmental Effects

The Planning and Development Act 2000 requires an EIAR to contain: “A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment”. For the purposes of this EIAR design mitigation and embedded mitigation are defined as:

- **Design Mitigation:** this identifies mitigation that has been incorporated into the design of the Proposed Development (e.g., a key part of the design concept was to mitigate the visual impact of the proposal. It obtained inspiration from the adjoining industrial and power generating infrastructure and the design was developed in a way that would allow the proposed plant and structures to sit easily against this backdrop).
- **Embedded Mitigation:** measures will be identified in order to avoid, reduce and, if possible, offset significant adverse effects identified during the EIA process. Where possible, these mitigation measures will be incorporated into the form or design of the Proposed Development. Once these measures are incorporated into the design, they are termed ‘embedded mitigation’. Embedded mitigation relevant to the construction phase will be described within the CEMP (CEMP). For the operational phase, such embedded mitigation will be represented primarily in the design. Embedded mitigation measures are therefore either incorporated into the design from the outset or identified through the assessment process.

Table 21.2 provides a summary of the significant environmental effects of the Proposed Development that have been identified, following implementation of the embedded mitigation or impact avoidance measures included in the design of the Proposed Development (as detailed in Chapters 7 to 19, where relevant).

Table 21.3 provides a summary of the schedule of environmental commitments. that have been identified in the EIAR technical assessments to mitigate significant environmental effects.

Effects have been assessed for the construction phase, operational phase (including maintenance) and decommissioning phase scenarios.

For the purposes of this EIAR (as outlined in EIAR Chapter 1) an effect is considered to be ‘significant’ if it is assessed to be moderate (adverse or beneficial) or major (adverse or beneficial). Minor and negligible effects are only referenced in this chapter where a ‘significant’ (moderate or major) effect has been reduced to a ‘not significant’ effect following mitigation.

To provide further clarification on the nature of the effects, each has been identified for the purposes of this EIAR Chapter 21 Conclusion summary as:

Table 21.1: Description of Nature of Effects

Effect	Description
Long term (Lt)	Effects occurring throughout the operation of the Proposed Development (and potentially beyond), e.g., due to a change in land use as a result of the development;
Medium term (Mt)	Effects occurring for a period of approximately five to fifteen years, e.g., a visual effect from a development that is removed when mitigation planting has matured;
Short term (St)	Effects occurring only over a relatively short period of time (less than five years), e.g., an effect that only lasts for the duration of the construction period;
Temporary (T)	Effects that are not permanent because the effect would no longer occur if the impact was removed, e.g., a disturbance effect that ceases when the source of the disturbance is no longer present;
Permanent (P)	Effects that are permanent and cannot be readily reversed, e.g., the loss of an ecological habitat that cannot be replaced;
Direct (D)	Effects that occur as a direct result of an impact caused by a development, e.g., a change in noise level as a result of development-related activity; or
Indirect (In)	Also known as secondary effects, effects that occur as a result of a pathway of impacts, e.g., socio-economic benefits due to construction workers spending money at local businesses.

21.1.2 Guidance

Works will be undertaken in accordance with the following environmental management technical guidance documents:

- CIRIA¹ (2001). *Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532)*.
- CIRIA (2006). *Control of water pollution from linear construction projects. Technical guidance (C648)*.

¹ Construction Industry Research and Information Association

- CIRIA (2016). *Environmental Good Practice on site pocketbook (C762)*.
- EPA (2021). *Best Practice Guidelines for The Preparation of Resource Management Plans for Construction & Demolition Projects*.

Table 21.2: Summary of Significant Environmental Effects

DEVELOPMENT PHASE	ENVIRONMENTAL IMPACT (FOLLOWING DEVELOPMENT DESIGN AND EMBEDDED MITIGATION MEASURES)	CLASSIFICATION OF EFFECT PRIOR TO MITIGATION	MITIGATION/ ENHANCEMENT (IF IDENTIFIED)	CLASSIFICATION OF RESIDUAL EFFECT AFTER MITIGATION	NATURE EFFECT(S) (LT/ MT/ ST AND T/ P AND D/ IN)	OF T/ P	MITIGATION ITEM NUMBER (REFER TO TABLE 21.3)
AIR QUALITY (EIAR CHAPTER 7)							
Construction	No significant effects identified.						N/A
Operation	No significant effects identified.						N/A
Decommissioning	No significant effects identified.						N/A
CULTURAL HERITAGE (EIAR CHAPTER 8)							
Construction	No significant effects identified.						N/A
Operation	No significant effects identified.						N/A
Decommissioning	No significant effects identified.						N/A
BIODIVERSITY (EIAR CHAPTER 9)							
Construction and Decommissioning	Mortality or Injury to common lizard, hare, and hedgehog.						
	Mortality or injury to breeding birds and their eggs.						
	Breeding bird habitat loss and damage.	Significant at local / site level.	Excavations will be left with a method of escape.	Not significant	Lt / P / D		B1
	Disturbance/ displacement of breeding birds.		Safeguard Breeding Birds and nesting locations.				
	Risk of disturbance to white- tailed eagle.						

DEVELOPMENT PHASE	ENVIRONMENTAL IMPACT (FOLLOWING DEVELOPMENT DESIGN AND EMBEDDED MITIGATION MEASURES)	CLASSIFICATION OF EFFECT PRIOR TO MITIGATION	MITIGATION/ ENHANCEMENT (IF IDENTIFIED)	CLASSIFICATION OF RESIDUAL EFFECT AFTER MITIGATION	NATURE OF EFFECT(S) (LT/ MT/ ST AND T/ P AND D/ IN)	MITIGATION ITEM NUMBER (REFER TO TABLE 21.3)
		Significant at national level.				
Operation	No significant effects identified.					
LANDSCAPE AND VISUAL (EIAR CHAPTER 10)						
Construction	Effects to landscape character or visual amenity within the locality or the wider study area resulting from the visibility of temporary site infrastructure such as site traffic, machinery working on elevated ground and construction compounds.	The landscape and visual effects and their significance at construction stage will range from Not Significant to Adverse to Slight/ Neutral	Tall machinery will only be on Site for a limited period. Construction traffic will be managed to reduce visual disturbances on local residents. Lighting will be kept to essential locations only, with the position and direction of lighting being designed to minimise intrusion and disturbance to adjacent areas (see Appendix 5A, EIAR Volume II). Lighting will be minimised in terms of number of lights and the power of the lights (lux level). Directional lighting, facing and located away from any surrounding vegetation; and Lighting will be turned off where possible when not in use except to meet the minimum requirements for Health and Safety.	Range from Not Significant to Slight in close proximity to the construction site (up to approximately 500m from the Proposed Development Site). Not Significant in the wider study area (beyond approximately 500m).	St/T	LV1 and 2

DEVELOPMENT PHASE	ENVIRONMENTAL IMPACT (FOLLOWING DEVELOPMENT DESIGN AND EMBEDDED MITIGATION MEASURES)	CLASSIFICATION OF EFFECT PRIOR TO MITIGATION	MITIGATION/ ENHANCEMENT (IF IDENTIFIED)	CLASSIFICATION OF RESIDUAL EFFECT AFTER MITIGATION	NATURE OF EFFECT(S) (LT/ MT/ ST AND T/ P AND D/ IN)	MITIGATION ITEM NUMBER (REFER TO TABLE 21.3)
Operation	Likely effects of the development on views and visual amenity such as the potential for the development to alter (beneficial or adverse) the composition of the view from a viewpoint. The main landscape and visual effects of the Proposed Development will be associated with the introduction of the air intake and emissions stack, integrating with the established industrial character of the site and its surroundings.	The landscape effects will range from Not Significant to Neutral Visual effects range from Low to None.	Given the scale and location of the Proposed Development, the main landscape and visual mitigation measures focus on architectural mitigation (colour and finishes of the scheme) and minimising lighting during night-time. Hence measures will be implemented immediately and come into effect following the completion of construction works.	The landscape effects will range from Not Significant to Neutral. Residual visual effects will range from Low to None.	Mt/Lt	LV1 and 2
Decommissioning	As per landscape construction phase.					N/A
NOISE AND VIBRATION (EIAR CHAPTER 11)						
Construction	No significant effects identified with the exception of NSR 1 during the peak month.	Temporary / Short-Term	Selection of quieter construction plant and implementation of general mitigation measures comprising those in BS 5228-1 Table B.1	Not significant	St/T	N1
Operation	No significant effects identified with the exception of NSR1	Long Term / Reversible	Minimum acoustic requirements on the performance of an acoustic louvre and	Not significant	Lt/Reversible	N2

DEVELOPMENT PHASE	ENVIRONMENTAL IMPACT (FOLLOWING DEVELOPMENT DESIGN AND EMBEDDED MITIGATION MEASURES)	CLASSIFICATION OF EFFECT PRIOR TO MITIGATION	MITIGATION/ ENHANCEMENT (IF IDENTIFIED)	CLASSIFICATION OF RESIDUAL EFFECT AFTER MITIGATION	NATURE OF EFFECT(S) (LT/ MT/ ST AND T/ P AND D/ IN)	MITIGATION ITEM NUMBER (REFER TO TABLE 21.3)
			gas turbine building envelope.			
Decommissioning	No significant effects identified.					N/A
WATER ENVIRONMENT (EIAR CHAPTER 12)						
Construction	No significant effects identified.					N/A
Operation	No significant effects identified.					N/A
Decommissioning	No significant effects identified.					N/A
LAND AND SOILS (EIAR CHAPTER 13)						
Construction	No significant effects identified.					N/A
Operation	No significant effects identified.					N/A
Decommissioning	No significant effects identified.					N/A
TRAFFIC AND TRANSPORT (EIAR CHAPTER 14)						
Construction	HGV construction traffic flow generated by the development on minor roads.	Temporary Negative	/ Implementation of the detailed Construction Traffic Management Plan	Not Significant	St/T/D	T1
Operation	No significant effects identified.					N/A
Decommissioning	No significant effects identified.					N/A
POPULATION AND HUMAN HEALTH (EIAR CHAPTER 15)						
Construction	No significant effects identified.					N/A

DEVELOPMENT PHASE	ENVIRONMENTAL IMPACT (FOLLOWING DEVELOPMENT DESIGN AND EMBEDDED MITIGATION MEASURES)	CLASSIFICATION OF EFFECT PRIOR TO MITIGATION	MITIGATION/ ENHANCEMENT (IF IDENTIFIED)	CLASSIFICATION OF RESIDUAL EFFECT AFTER MITIGATION	NATURE OF EFFECT(S) (LT/ MT/ ST AND T/ P AND D/ IN)	MITIGATION ITEM NUMBER (REFER TO TABLE 21.3)
Operation	No significant effects identified.					N/A
Decommissioning	No significant effects identified.					N/A
MATERIAL ASSETS (EIAR CHAPTER 16)						
Construction	No significant effects identified.					N/A
Operation	No significant effects identified.					N/A
Decommissioning	No significant effects identified.					N/A
CLIMATE (EIAR CHAPTER 17)						
Construction	No significant effects identified.					N/A
Operation	No significant effects identified.					N/A
Decommissioning	No significant effects identified.					N/A
WASTE MANAGEMENT (EIAR CHAPTER 18)						
Construction	No significant effects identified.					N/A
Operation	No significant effects identified.					N/A
Decommissioning	No significant effects identified.					N/A
MAJOR ACCIDENTS AND DISASTERS (EIAR CHAPTER 19)						
Construction	No significant effects identified.					N/A
Operation	No significant effects identified.					N/A
Decommissioning	No significant effects identified.					N/A

Note: Lt = long term, Mt = medium term, St = short term, P = permanent, T = temporary, D = direct and In = indirect.

21.1.3 Schedule of Environmental Commitments

As described throughout each of the chapters within the EIAR, there are instances where the environmental effects associated with the Proposed Development may be of such a magnitude as to warrant mitigation measures. These measures are deemed necessary to minimise environmental impacts during the operation, construction and/ or maintenance phases of the Proposed Development.

This Schedule of Environmental Commitments (Table 21.3) provides a collective summary of the proposed mitigation measures. Specifically, the following have been tabulated:

- Mitigation measure item number.
- Approximate location of mitigation measure.
- Mitigation objective and commitment.
- Potential timing of the mitigation measure.
- Potential monitoring requirements; and
- Potential additional consultation proposed.

As described in the schedule, there may be a requirement for additional consultation to be carried out (i.e., with statutory bodies and other interested parties). Table 21.3 provides a brief summary of the overall committed mitigation measures.

Table 21.3: Schedule of Environmental Commitments

MITIGATION ITEM NO.	APPROX LOCATION	MITIGATION OBJECTIVE AND COMMITMENT	POTENTIAL MEASURE	MITIGATION TIMING OF MEASURE	MITIGATION MONITORING REQUIREMENTS	ADDITIONAL REQUIREMENT
AIR QUALITY (EIAR CHAPTER 7)						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
CULTURAL HERITAGE (EIAR CHAPTER 8)						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
BIODIVERSITY (EIAR CHAPTER 9)						
B1	Construction area	Safeguard breeding birds. Safeguard small mammals and reptiles.	No site clearance between March and August unless first checked by an ECoW. Excavations will be left with a method of escape.	Year round	None	None
LANDSCAPE AND VISUAL (EIAR CHAPTER 10)						
LV1	Proposed Site Location	Maximise visual integration of proposed buildings into their environment.	Selection of appropriate colours, materials and textures for built structures to minimise their visual impact and to allow buildings to be as unobtrusive as possible against their backdrop.	Planning and Operational Phase	Regular maintenance during operation	N/A
LV2	Proposed Site Location	Reduction of visual effects due to additional lighting.	Lighting will be kept to essential locations only, with the position and direction of lighting being designed to minimise intrusion and disturbance to adjacent	Operational Phase	Regular maintenance during operation	N/A

MITIGATION ITEM NO.	APPROX LOCATION	MITIGATION OBJECTIVE AND COMMITMENT	POTENTIAL MEASURE	MITIGATION TIMING OF MEASURE	MITIGATION MONITORING REQUIREMENTS	ADDITIONAL REQUIREMENT

areas. Use of full cut-off lanterns are proposed to minimise light spillage and upward escape of light onto adjacent areas.

NOISE AND VIBRATION (EIAR CHAPTER 11)

N1	Site	Selection of quieter construction plant and implementation of general mitigation measures comprising those in BS 5228-1 Table B.1	All noise and vibration generating construction plant will be shut down when not in use. The loading and unloading of materials will take place away from NSRs, ideally in locations which are acoustically screened. Materials will be handled with care and placed rather than dropped where possible. Drop heights of materials from lorries and other plant will be kept to a minimum.	Construction phase	Controls to be monitored to ensure they are enforced.	N/A
N2	OCGT building	To reduce break out noise from internal sound sources from within the OCGT building	Minimum specification provided for Gas Turbine Building wall/roof construction and gas turbine air intake louvre.	Operational phase	N/A	N/A

WATER ENVIRONMENT (EIAR CHAPTER 12)

N/A	N/A	N/A	N/A	N/A	N/A	N/A

SOILS AND GEOLOGY (EIAR CHAPTER 13)

MITIGATION ITEM NO.	APPROX LOCATION	MITIGATION OBJECTIVE AND COMMITMENT	POTENTIAL MEASURE	MITIGATION TIMING OF MEASURE	MITIGATION MONITORING REQUIREMENTS	ADDITIONAL REQUIREMENT
N/A	N/A	N/A	N/A	N/A	N/A	N/A
TRAFFIC AND TRANSPORT (EIAR CHAPTER 14)						
T1	Site access Road	Control of HGV construction traffic flow generated by the development on minor roads.	Construction Traffic Management Plan.	During the Construction phase	Controls to be monitored to ensure they are enforced.	N/A
POPULATION AND HUMAN HEALTH (EIAR CHAPTER 15)						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
MATERIAL ASSETS (EIAR CHAPTER 16)						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
CLIMATE (EIAR CHAPTER 17)						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
WASTE MANAGEMENT (EIAR CHAPTER 18)						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
MAJOR ACCIDENTS AND DIASTERS (EIAR CHAPTER 19)						
N/A	N/A	N/A	N/A	N/A	N/A	N/A

21.2 References

CIRIA (2001). *Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532)*.

CIRIA (2006). *Control of water pollution from linear construction projects. Technical guidance (C648)*.

CIRIA (2016). *Environmental Good Practice on site pocketbook (C762)*.

Environmental Protection Agency (EPA) (2002). *Guidelines on Information to be contained in Environmental Impact Statements*.

Environmental Protection Agency (EPA) (2003). *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements*.

Environmental Protection Agency (EPA) (2016). *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities*.

Environmental Protection Agency (EPA) (2017). *Advice Notes for Preparing Environmental Impact Statements*.

Environmental Protection Agency (EPA) (2021). *Best Practice Guidelines for The Preparation of Resource Management Plans for Construction & Demolition Projects*.

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ESB (2008). *Code of Practice for Avoiding Danger from Overhead Electricity Lines*.

