

# Temporary Emergency Generation Power Plant

## Tarbert Power Station

### Environmental Report

February 2023

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# 1. Introduction

## 1.1 Background

This Environmental Report has been prepared by AECOM Limited (refer to Appendix A) on behalf of SSE Generation Ireland Limited ('the Applicant or SSE') in relation to the application to the Minister for the Environment, Climate and Communications ('the Minister') for approval to carry out the development of Temporary Emergency Generation within the boundary of Tarbert Power Station, Tarbert, Listowel, Co. Kerry ('the Designated Development'). The assessment of the Designated Development will be carried out by An Bord Pleanála ('the Board') to ensure that the objectives 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, amended by Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 ('the EIA Directive') are met.

The Environmental Report is provided as part of the application for approval for the Designated Development which will involve construction works, installation and operation and eventual decommissioning of three Open Cycle Gas Turbines with a total operational output capacity of 150MWe on 13.55ha of land ('the Site') within the existing operational Tarbert Power Station Site boundary.

The Site has been selected for Temporary Emergency Generation (TEG) development by the Irish Government under new legislation '*Development (Emergency Electricity Generation) Act 2022*<sup>1</sup>'. The facility will be connected to the existing 220kV EirGrid substation to the south of the Tarbert Power Station Site via an underground cable approximately 560m in length.

For the purposes of this Environmental Report, the following terms are used to describe the Designated Development and its wider parts:

- **'the Designated Development'** – relates to the 3 no. 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 electrical substation.
- **'the Site'** – relates to the area contained within the red line boundary which encompasses the main development area where the Designated Development is to be located (also known as Area B) including the construction compounds and laydown areas, and access and egress; and
- **'Tarbert Power Station Site'** – relates to the entire power station site where the existing power station is located and operational, and within which the Designated Development will be located.

This Environmental Report is supported by the following figures which detail the Designated Development layout and design:

- Figure 1: Site Location Map
- Figure 2: Site Layout

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<sup>1</sup> <https://data.oireachtas.ie/ie/oireachtas/bill/2022/99/eng/initiated/b9922d.pdf>

- Figure 3: Designated Development - Detailed Site Layout Plan

## 1.2 Legislative Framework

Given the urgent need for temporary emergency electricity generation for the purpose of ameliorating and protecting security of electricity supply in the State because exceptional circumstances have arisen in the market for that supply and further because of the situation in Ukraine, the *Development (Emergency Electricity Generation) Act 2022* ('the Act') was enacted to provide for emergency measures for electricity generation development.

The Act allows for the disapplication of the Planning and Development Act 2000 for the purpose of such development. The Act also allows for such development to be exempt from the provisions of the Environmental Impact Assessment (EIA) Directive, on the basis that the Designated Development is an exceptional case for the purposes of Article 2(4) of the EIA Directive and the application of those provisions would adversely affect the purpose, of the Designated Development.

The Act provides for the application of arrangements for the alternative assessment of such development for the purposes of ensuring the objectives of the EIA Directive are met. It also provides for the coordination of this assessment with the appropriate assessment of such development for the purposes of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, amended by Council Directive 97/62/EC of 27 October 1997, Regulation (EC) No. 1882/2003 of the European Parliament and of the Council of 29 September 2003, Council Directive 2006/105/EC of 20 November 2006 and Council Directive 2013/17/EU of 13 May 2013 ('the Habitats Directive').

The *Development (Emergency Electricity Generation) Regulations 2022* (S.I. No. 719 of 2022) establishes, *inter alia*, the procedure for making an application to the Minister for the Environment, Climate and Communications ('the Minister') under the Act, content and arrangements for publication of the Newspaper Notice, provision of application documents by the Minister to the Board, Public consultation, scope of the Environmental Report, Assessment by the Board and Recommendations to the Minister.

Regulation 3 (Application to the Minister) sets down the scope and format of the application under Section 4 of the Act for an approval under Section 7 of the Act. The checklist in Appendix D provides a roadmap describing where each requirement under Regulation 3 is addressed in this application.

### 1.2.1 Environmental Report

The Designated Development is exempt from the provisions of the EIA Directive on the basis that it is an exceptional case for the purposes of Article 2(4) of the EIA Directive and the application of those provisions would adversely affect the purpose of the Designated Development. The Minister will arrange for an environmental assessment of the Designated Development to be carried out by the Board to ensure that the objectives of the EIA Directive are met.

This Environmental Report has been prepared for the purposes of an assessment by the Board under section 5(2) of the Act and for the purpose of ensuring that the objectives of the EIA Directive are met.

Table 1.1 identifies where the information defined under Regulation 7(2) can be located within this Environmental Report.

**Table 1-1: Environmental Report Contents .**

**Information to be contained in an Environmental Report section where information is presented**

<i>A description of the designated development including information on the site, design, size, and other relevant features of the development;</i>	Section 2 – Description of the Designated Development
<i>A description of the relevant aspects of the current state of the environment (baseline scenario);</i>	Section 4 - Environmental Effects and Management
<i>A description of the approach taken for the purposes of describing the likely main effects on the environment at the construction and operational phases of the designated development;</i>	Section 1 - Introduction
<i>A description of the likely main effects of the designated development on the factors referred to in Regulation 8(2);</i>	Section 2 – Description of the Designated Development ; Section 3 – Description of Works; and Section 4 – Environmental Effects and Management
<i>A description of the features of the designated development and measures envisaged in order to avoid, prevent, or reduce and, if possible, offset the likely main effects on the environment;</i>	Section 2 – Description of the Designated Development
<i>Any other information or document that the applicant considers would be of assistance to the Board in carrying out an assessment under section 5(2) of the Act of 2022.</i>	Section 4 – Environmental Effects and Management Section 5 - Summary

The likely main effects of the Designated Development on the factors referred to in Regulation 8(2) are identified, described, and assessed within Section 4 of this document.

### 1.3 The Applicant

The Applicant, SSE Generation Ireland Limited, part of the FTSE-listed SSE plc, is a leading developer, owner and operator of flexible generation, energy-from-waste, and energy storage assets, with over 600 direct employees across the UK and Ireland. SSE's vision is to become the leading provider of flexible thermal energy in a net-zero world. SSE Generation Ireland Ltd. currently operates the existing Tarbert Power Station.



## 1.4 Need for the Development and Consideration of Alternatives

### 1.4.1 Need for the Development

EirGrid's *All-Island Generation Capacity Statement (GCS)*<sup>2</sup>, published in September 2021, set out a potential generation capacity shortfall in the short and medium term. This potential capacity shortfall could arise in periods of peak demand coinciding with low renewable and interconnector availability, and it arises largely due to non-delivery of previously contracted capacity, increasing electricity demand and the increasing unreliability of existing plants. The Legislature has determined that this is an electricity emergency and has therefore introduced emergency powers to address it under the *Act*.

The Commission for Regulation of Utilities (CRU) has statutory responsibility to monitor and take measures necessary to ensure the security of electricity supply. The CRU has published an Information note in this regard, titled *Security of Electricity Supply – Programme of Actions*<sup>3</sup>. The report summarised EirGrid's assessment of an electricity supply deficit over the next several winters. In addition, it outlined key elements of the programme of actions being undertaken by the CRU, in line with its statutory duties, in cooperation with EirGrid, the Department of Environment, Climate and Communications (DECC), the energy industry and other stakeholders, to provide additional stability and resilience to the Irish energy system.

CRU is assisted in this role by EirGrid, Ireland's electricity transmission system operator (TSO). On 7 June 2022, the CRU directed EirGrid to procure, using the most expeditious means available, approximately 450MW of additional generation capacity from winter 2023-24 to winter 2025-26 to ensure a secure electricity supply. This temporary generation capacity will be in place until 2027 at the earliest, with provision in the legislation to extend to 2028. This procurement process was provided for in the *EirGrid, Electricity and Turf (Amendment) Act 2022*<sup>4</sup>. EirGrid has commenced the process and they are working towards this 450MW of additional generation capacity, comprising two emergency generation projects, details of which are addressed below, being delivered by winter 2023-24.

This capacity will remain available until 2027 at the earliest, with provision in the legislation to extend to 2028 if required by the order of the Minister in accordance with the provisions of the *EirGrid, Electricity and Turf (Amendment) Act 2022*. The temporary generation will be used only when needed and will be used as a backup in addition to generation capacity in the electricity market.

### 1.4.2 Alternatives Considered by EirGrid

#### 1.4.2.1 Do Nothing Scenario

The capacity auction for the period 1<sup>st</sup> October 2024 to 30<sup>th</sup> September 2025 was held at the end of January 2021. It is understood that the withdrawal of previously procured capacity and the failure of the recent auction to clear sufficient capacity mean there is a significant capacity shortfall against security standards for Ireland in the coming years.

<sup>2</sup> <https://www.eirgridgroup.com/site-files/library/EirGrid/208281-All-Island-Generation-Capacity-Statement-LR13A.pdf>

<sup>3</sup> [https://www.cru.ie/document\\_group/security-of-electricity-supply-programme-of-actions/](https://www.cru.ie/document_group/security-of-electricity-supply-programme-of-actions/)

<sup>4</sup> <https://www.oireachtas.ie/en/bills/bill/2022/63/>

EirGrid identified a potential generation gap of 700MW for the winter of 23/24, in the absence of any mitigation measures being implemented. The *Security of Electricity Supply – Programme of Actions* contains a number of both demand and supply-side mitigation measures that are anticipated to address this gap.

Many of these mitigation measures, already underway, are more closely aligned to Ireland's longer term decarbonisation objectives and are preferable options to further increased installation of temporary generation capacity. European legislation also requires that all market-based measures are exhausted, prior to implementing non-market-based measures such as temporary emergency generation.

Notwithstanding, the CRU considers the impact of the current mitigation measures will have the effect of reducing the generation gap for Winter 2023/24 but not to the extent of the potential generation gap identified. Therefore, having exhausted all measures, the CRU advised the Minister that up to 450MW ("TEG 2") of additional temporary emergency generation should be sought to address the remainder of this gap in addition to the 200MW ("TEG 1") currently in the process of being procured.

If the proposed emergency generation does not proceed, there is a clear risk that power outages could occur due to the forecasted system demand and shortfall forecasted system generation identified in the EirGrid Generation Capacity Statement. This would have a significant adverse effect in terms of energy requirements and supply at home, at work, for commercial developments and industry.

The assessment of alternatives for the Designated Development was undertaken in this context and influenced by the emergency context and need for the development.

#### **1.4.2.2 Technology Selection by EirGrid**

The CRU issued a direction to EirGrid to procure 450MW of temporary emergency generation. Under the EirGrid, Electricity and Turf (Amendment) Act 2022, EirGrid can, subject to approval, procure the necessary temporary Electricity Generation Plant and auxiliaries (including generation and similar equipment) EirGrid engaged with and obtained proposals from Original Equipment Manufacturers (OEM's) based on the supply of distillate or Gas Turbine Generator (GTG) Unit equipment.

EirGrid confirmed that they considered it appropriate and reasonable to prescribe the technology alternatives given the context of the electricity emergency situation and the requirement to meet a specific technical need. They also noted that there is currently an increase in demand for GTGs globally and there are limited options, in the context of this emergency to, to place orders of plant that would be installed rapidly and be operational within the time constraints. In considering this issue they also examined floating or barge technology in addition to typical land-based technology solutions.

The range of technology EirGrid considered reasonable was limited to generation technologies which can be installed quickly, generate significant amounts of electricity, and comply with environmental emission controls and legislation. This limited the technology selection to Dispatchable Generation. EirGrid confirmed that the technology type was limited to plant that it considered temporary in nature, as opposed to permanent. Dispatchable Generation are sources of electricity that can be used on demand and dispatched at the request of power grid operators, according to system needs. It does not include wind and solar generation for example which are considered non-dispatchable generation. EirGrid noted that the emergency power plant needs to start quickly and will run when electricity demand

is high and generation capacity from other sources available on the system is at risk of not meeting demand.

Other factors which EirGrid considered in the selection of technology type:

- capability and commitment to secure procurement of the temporary Electricity Generation Plant;
- capability and commitment to commence as soon as practicable;
- capability and commitment to work with and support the Site Owners to:
  - meet the completion timescale;
  - expedited commencement and execution of the project(s).

Based on the above, EirGrid identified that an OEM demonstrated a timeline which can potentially achieve delivery by the target date, therefore EirGrid proceeded to negotiate with that OEM as the preferred supplier of the electricity generation plant technology.

#### **1.4.2.3 Site Selection by EirGrid**

The specific electricity generation of up to 450MW of temporary emergency generation and ancillary works is intended to be located on two separate sites one at Shannonbridge generating station and one at Tarbert generating station. EirGrid confirmed that these two sites were arrived at following an extensive site selection process which, overall, considered approximately 18 potential sites.

EirGrid has advised that the potential sites were identified based on four main criteria, that they set out as a pre-requisite requirement in order to reasonably achieve the projects in an emergency context with challenging timelines for delivery. These included:

1. Grid Connection and ability to export.
2. Fuel Connection (Gas or Distillate).
3. Land suitable for generation equipment is available and currently owned by the site owner.
4. Ability to obtain an EPA license or in process of acquiring one.

EirGrid confirmed that the criteria were designed to maximise the use of existing generation sites which was facilitated through a review of existing generation licence holders in Ireland and avoid development of new generation sites. EirGrid advised that criteria design ensures the Designated Development will not require the acquisition or development of any greenfield areas, mitigating potential environmental impacts by avoidance and that it is reasonable in the context of an emergency situation and facilitated a sieving approach in considering reasonable alternatives sites.

Once suitable potential sites were identified by EirGrid, they confirmed that the site owners were notified and requested to participate and that following engagement with the site owners sub-criteria were identified in addition to the main criteria above. These included additional criteria with which the participant sites were considered and further sieved. This included at a high level:

- Details of existing Connection Agreements and other Market Obligations;
- Details of future potential Connection Agreements and other potential Market Obligations;
- Details of the Generation that can be expected from each site;

- Ability to meet the target date energisation date of 1 October 2023 and operate for a minimum 3-year duration;
- Details of Environmental Reporting and Monitoring on Site;
- Details of the sites existing IPCC licensed site;
- Details of network constraints, that may restrict full export of power;
- Feasibility of making the required transmission connections without adverse impact on the existing generation plant output.

EirGrid then assessed each participant site against the main and sub-criteria. The outcome of this assessment produced three site classification types:

- **Red:** Site does not satisfy main and sub criteria– Further Information Required;
- **Amber:** Site may not satisfy main and sub criteria – Further Information Required;
- **Green:** Site satisfied main and sub-criteria.

EirGrid confirmed that the participant sites which were considered in the red and amber classification were further engaged with and asked to respond, where necessary, to clarify/address any points raised regarding their sites and that following this engagement, the site participants were once again assessed against the criteria on the basis of any new information received. Once this was completed EirGrid made a recommendation to CRU that Shannonbridge and Tarbert generation stations should be selected.

#### 1.4.2.4 Summary of technology and site selection by EirGrid

EirGrid confirmed that the potential technologies and sites were considered in the earliest possible time in the process and in the context of an electricity emergency.

EirGrid advised that the potential alternative technologies considered, on the basis of procurement exercise, were reasonable, credible, and technically feasible to meet the precise emergency need arising.

EirGrid advised that the potential alternative sites considered, on the basis of a sieving approach with a defined multi-criteria analysis, were reasonable, credible, and technically feasible to meet the precise emergency need arising.

## 1.5 Existing Site and Conditions

The Site is located in Tarbert, Listowel, County Kerry (Co. Kerry), approximately 1.8km north of the town of Tarbert. The Site is located within the existing Tarbert Power Station Site boundary which occupies an area of approximately 42ha.

The Site is off the N67, a National Secondary road in Tarbert, Co. Kerry, positioned on the west of the existing Power Station and is a brownfield site, surrounded by electricity generating, transmission and fuel storage infrastructure. The Site is therefore deemed suitable for a development of this nature. Furthermore, it will utilise an area of existing made ground, which is relatively flat in nature.

There are a number of residential dwellings and a public house (currently closed) located close to the proposed entrances off the N67. The National Oil Reserve Agency (NORA) Oil Storage Terminal is located to the southwest across a causeway. The Designated Development is bound to the north by fuel storage tanks which supply Tarbert Power Station and the Shannon Estuary; to the east by the Power Station, EirGrid 110kV and 220kV electrical transmission substations and an access road from the N67 National Secondary; to the south by a lagoon draining the Shannon Estuary and agricultural lands further south on the mainland; and to the west/northwest by Tarbert Jetty and the Shannon Estuary.

The Site will be accessed via the N67 from the southern or eastern entrances, which also serve the existing Power Station and the Tarbert-Killimer Ferry Terminal. The N67 connects the Site to the N69 Tralee / Limerick Road, located approximately 1.8km to the south.

The Site is located adjacent to the Lower River Shannon Special Area of Conservation (SAC) and the River Shannon and River Fergus Estuaries Special Protect Area (SPA). Tarbert Bay is also a proposed Natural Heritage Area (pNHA).

Plate 1.1 shows an aerial view of the existing site and Plate 1.2 shows an image taken viewing the Site from the north, with the existing Tarbert Power Station and emissions stack dominant within the view.



**Plate 1.1: Google Earth (2022) of Tarbert Power Station and its surroundings**



**Plate 1.2: Tarbert Power Station. Source: Sean Hartwell Photography, 2020.**

## 1.6 Description of the Designated Development

Refer to Section 2 of this document for full details on the Designated Development.

### 1.6.1 Location of the Designated Development

The Designated Development Site is situated north of Tarbert, Co. Kerry, Ireland (Irish Grid Reference X: 107161; Y: 212865). The entire Site is located within the administrative area of Kerry County Council (KCC).

The Site on which the Designated Development will be located is to the immediate west of the existing Tarbert Power Station Site. The development Site boundary (red line) encloses an area of 13.55ha. This red line boundary encompasses the area required for the construction of the Designated Development as well as construction laydown areas and access routes in and around the Tarbert Power Station Site.

### 1.6.2 Site History

The electricity generating station at Tarbert Power Station was developed in the 1960's, it is a 626MWe Heavy Fuel Oil (HFO) fired power plant, which has been operational since 1969. Located on the southern shore of the Shannon Estuary, on Tarbert Island, which is a man-made 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. It was constructed in two stages, units one and two commissioned in 1969 and units three and four commissioned in 1976 and 1977. Units three and four were refurbished in 2003

and 2004 and are fuelled by HFO with 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 Designated Development, which comprises four HFO tanks, each with a 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 located south of the Site are not related to the Power Station and are under the control of the National Oil Reserves Agency (NORA).

The plant has 38 employees and is available for operation 24 hours per day, 365 days per year. Unit start-up and shutdown are based on instructions from the grid controller.

**Table 1-2: Historic Planning Search of the Site**

Planning Application	Date Submitted	Summary Details	Applicant	Status
18392	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 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
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

## 1.7 Industrial Emissions Licence

The existing Tarbert Power Station is managed in accordance with its Industrial Emissions (IE) Licence P0607-02 and in accordance with the EU Emissions Trading System (ETS) and associated Greenhouse Gas Permit (GHG075-10383-4) as administered by the Environmental Protection Agency (EPA).

The Designated Development will be licenced by the EPA under the IE licencing process. An application to alter the existing IE licence or an application for a new IE licence will be made to the EPA for the new installation. Pre-application discussions have commenced between the Applicant and the EPA regarding the information required to support an application.

## 1.8 Methodology and Approach

The assessment of the likely main effects of the Designated Development on the environment arising from the construction, operation and decommissioning of the Designated Development are described in this report. There will be no demolition works associated with the Tarbert Power Station Site for the Designated Development. The assessments undertaken have used the best available information at the time of writing this report and more details are provided within the relevant sections as appropriate.

### 1.8.1 Scope of this Report

This Environmental Report is prepared for the purposes of an assessment by the Board of the Designated Development under section 5(2) of the Act of 2022. This document considers the likely main effects of the Designated Development on the environment and how any such effects will be mitigated. The following environmental aspects will be addressed:

- Description of the Designated Development
- Population and Human Health
- Biodiversity, with particular attention to species and habitats protected under Council Directive 92/43/EEC of 21 May 1992 and Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009
- Land and Soils
- Water
- Air Quality
- Climate
- Noise and Vibration
- Materials Assets
- Cultural Heritage
- Landscape and Visual
- Traffic Management
- Waste; and



- the interaction between the factors referred to above.

This report contains a description of the features of the Designated Development and the baseline environmental conditions and includes an assessment of the likely main effects of the Designated Development on the environment. This assessment has been used to define the measures envisaged in order to avoid, prevent, or reduce and, if possible, offset the likely main effects of the Designated Development on the environment.

## 1.9 Appropriate Assessment

A statement of information for the purposes of the carrying out by the Board of a screening for Appropriate Assessment (an Appropriate Assessment (AA) Screening Report) has been prepared to enable the competent authority to assess, in view of best scientific knowledge, if the Designated Development, individually or in combination with another plan or project, is likely to have a significant effect on any European site.

The Appropriate Assessment (AA) Screening Report has been prepared in accordance with the European Commission (EC) guidance document *Assessment of Plans and Projects Significantly affecting Natura 2000 Sites: Methodological Guidance* on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC (EC, 2001). It also accords with the guidance provided in the Office of the Planning Regulator (OPR) document on Appropriate Assessment Screening for Development Management (OPR, 2021).

A Natura Impact Statement (NIS) has also been prepared as part of this application.

The NIS concluded that, subject to identified mitigation measures, the Designated Development will have no adverse effect on the integrity of any European site, either alone or in-combination with other plans or projects.

## 1.10 Control of Major Accident Hazards (COMAH) and Major Accidents

The European Communities, Control of Major-Accident Hazards involving Hazardous Substances (COMAH) Regulations under Directive 2012/18/EU were transposed into Irish legislation through *S.I. No. 209 of 2015 Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015*.

The regulations require operators of establishments where specified substances are present, in quantities equal to or in excess of defined threshold, to take all measures necessary to prevent major accidents, limit their consequences and ensure a high level of protection for populations and the environment.

Establishments which store more than 2,500 tonnes of distillate oil on site fall under the remit of the COMAH Regulations and are classified as 'lower tier' unless the amount stored exceeds 25,000 tonnes when they become 'upper tier' sites.

The quantity of distillate oil to be stored on the Site is 2,660 tonnes (three circular oil storage tanks positioned on the north-western section of the Site), capacity to store approximately 3000m<sup>3</sup>.

Tarbert Power Station is currently designated as an upper tier site due to the type and volume of liquid fuel stored on the Tarbert Power Station Site. The most recent COMAH inspection was completed 27<sup>th</sup> July 2022.

The Designated Development will operate on distillate fuel only and will therefore require additional storage of distillate on Site. The COMAH status of the Site will not alter, and the Applicant is fully aware of the actions required to comply with the legislative requirements.

## 2. Description of the Designated Development

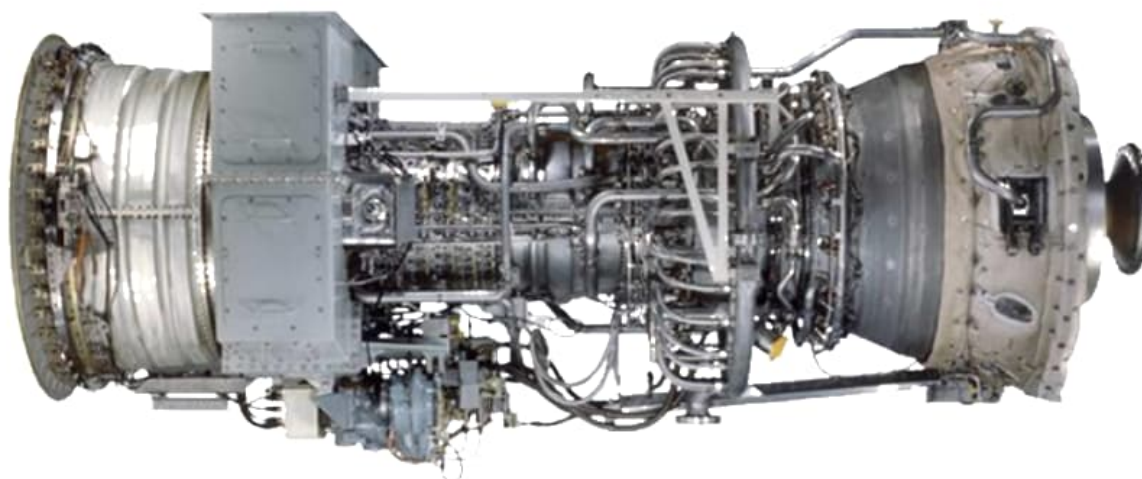
### 2.1 Introduction

This section of the Environmental Report provides a detailed description of the Designated Development, which will consist of three new open cycle gas turbine units and ancillary infrastructure and development, site works and services at the Tarbert Power Station Site in Co. Kerry.

The Designated Development consists of the installation of three OCGT units which will collectively have the capacity to generate 150MWe of temporary emergency electricity, site development and associated ancillary works required for the operation of the plant. The plant will operate as an emergency plant, with a maximum running time of 500 hours per annum, spending the majority of time on standby, and will be run to meet emergency security of supply needs while complementing renewable power generation sources.

The objective of the project is to facilitate and ensure security of supply and provide support to the electricity network during periods when there is a gap between the renewable power generation and power demand.

The three LM6000 units (shown in Plate 2.1) have been selected for development as they are able to respond to changes in electricity demand by starting up quickly and achieving full output within a short period of time.



**Plate 2.1: LM6000 Gas Turbine (Source GE)**

With regard to the operational phase, it is envisaged that the Designated Development will have to be temporarily operational at the Site for approximately five years. At the end of the temporary period, the Designated Development will be decommissioned, dismantled, and removed from this Site. Decommissioning would therefore be expected to commence at some point during 2027 and 2028.

## 2.2 Site Information

### 2.2.1 Site Location

The Site on which the main elements of the Designated Development will be located is on the western side of the existing Tarbert Power Station Site, immediately west of the four existing fuel tanks which are associated with the existing operating power station, shown in Plate 2.2. The Site for the Designated Development works is 13.55ha. Refer to Figure 1 and Figure 2 (submitted with this application).

This red line boundary encompasses the area required for the construction of the Designated Development as well as construction laydown areas and access routes in and around the Tarbert Power Station Site.



Plate 2.2: Location of the Designated Development

## 2.3 Main Features of the Designated Development

The purpose of this section is to provide further detail on the various components of the Designated Development including structures and infrastructure. All of the various components which make up the Designated Development are contained within the area shown on the Designated Development Plan (refer to Figure TAR/00/E/001b-003/GA/202 – Plant Layout) and are described or encompassed within the description of the Designated Development.

There will be three gas turbine units located at the Tarbert Power Station Site, each with the capacity of 50MWe which will run on distillate fuel. The Designated Development will comprise the following main components:

- 3 No. 50 MW Gas Turbine generators
- 3 No. Exhaust stacks – 30m tall
- 3 No. Fin fan Coolers with several control modules
- 6 No. Fuel oil tanks (80m<sup>3</sup>) (containerised).
- 6 No. Containerised switchgear and control modules.
- 1 No. Fuel oil drain tank for filter change over.
- 3 No. Fuel oil storage tanks (1000m<sup>3</sup>).
- 2 No. Demineralisation treatment units.
- 1 No. Demineralisation water storage tanks (1320m<sup>3</sup>).
- 1 No. Raw and Fire water storage tank (2500m<sup>3</sup>).
- 2 No. Distillate fuel unloading and forwarding.
- 2 No. Pre Filters.
- 1 No. Coalescer Filter.
- 3 No. Fuel oil heaters.
- Instrument air compressors.
- 3 No. Generator circuit breakers.
- 2 No. Generator step-up transformers.
- 1 No. Administration building.
- 1 No. 220kV substation, and
- Circa. 560m underground cable to connect to an existing onsite 220kV substation

The construction phase of the Designated Development will comprise:

- temporary construction and laydown areas comprising hardstanding, laydown, and open storage areas;
- temporary facilities and stores;
- materials and plant storage;
- contractor compound and construction staff office and welfare facilities;
- temporary vehicle parking facilities; and
- signage.

In connection with and in addition to the above, the following infrastructure will be included:

- internal roads;
- external lighting, including lighting columns;
- security fencing and gates; and
- utilities, pipes, cables and connection to surface water drainage systems, oil-water separators, including channelling, culverting, crossings and works to existing drainage systems.

The Designated Development elements are described in detail in the following sections.

### **2.3.1 Gas Turbine Units**

The Designated Development will include three (3 no.) gas turbine units, each comprising a single gas turbine and a single alternating current (AC) generator. The generators and gas turbines will be equipped with weatherproof, acoustic enclosures with dedicated ventilation systems.

The net power output of the gas turbines will be up to 150MWe approximately. Power export will be facilitated via:

- The grid connection agreement having the net generation capacity (i.e., 150MWe combined total);
- The electrical systems will be sized to the maximum export load (i.e., transformers, generator, and cables); and
- The gas turbines will be designed, installed, and controlled to deliver the specific energy output that is proposed. This is an essential part of maximising the efficiency and performance of the machine.

The turbines and ancillary plant elements will have a containerised control module which will house the turbine controls and a containerised electrical module which will supply power to the turbines and their associated auxiliary systems.

The turbines will use forced air-cooling radiators to dissipate heat from the lubrication oil and other essential systems when operational. No wet cooling system is required.

The turbines will fire distillate fuel to generate power (transported to site via heavy goods vehicle (HGV) tanker and stored on Site in above ground tanks). The configuration allows the turbine to respond with full power output within 20 minutes of being instructed to do so. This fast response allows the turbine to provide essential balancing services to the grid.

The gas turbine units have been specified to comply with the NO<sub>x</sub> emissions requirements of the BAT requirements (2021) for a plant running under 500hours per annum, without supplemental emissions abatement, through the use of primary means and using water injection for NO<sub>x</sub> abatement. Selective Catalytic Reduction (SCR) is not considered to be BAT for plant running for limited hours (less than 1500hours per annum) due to the temperature window of the flue gas that is required to optimise SCR performance. Consequently, the flue gases generated will pass directly from the gas turbine unit to a flue stack structure.

### **2.3.2 Emissions Stack**

The proposed emissions stacks will be 30.0m high, 4.0m in diameter and will be constructed for each gas turbine. The stack will be stainless steel lined to avoid corrosion.

Flue gases from a gas turbine can be up to 600°C in temperature and the emissions stack structure includes a number of measures to accommodate such a high temperature gas. The stack will be double skinned with a layer of insulation between the inner and outer cylinders to the stack. This minimises heat transfer to the surrounding structure.

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 temperatures. The gas turbines will be compliant with current best available techniques for NOx limits.

### **2.3.3 Acoustic Walls and Barriers**

An acoustic wall will surround each of the three generating units on the Site. These acoustic walls will be 8m high and 18m in length along the southeast of each unit. There will also be one 5m high acoustic wall 45m in length in the most southern point of the Site.

An acoustic barrier 4m in height will surround the western and southern extents of the Designated Development Site during the construction phase. This configuration allows for attenuation of the noise emissions from the construction works and provides visual screening to ecological receptors.

### **2.3.4 Fin Fan Coolers**

A bank of fin fan coolers will be situated to the east of each gas turbine unit.

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

The coolers comprise fixed speed fans that draw air over banks of finned tubes through which the hot oil from the operational equipment is circulated. The finned tube banks 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 fixed speed will be set to match the cooling requirements of the power generating equipment. This minimises the noise impact of the fans and reduces power load during operation.

### **2.3.5 Fire Water Storage Tank**

A combined raw and fire water storage tank will be provided on the Site with a volume of 2500m<sup>3</sup> for the temporary emergency generators.

### **2.3.6 Piping and Cabling**

Pipework and cabling connections will be laid between the gas turbine units and the two generator step-up transformers located to the east of the units, the fuel storage tanks and the water forwarding pump. The pipework and cabling will be a combination of underground and above ground in gantries where required (mostly across access roads within the Site).

A raw water pipe will be laid above ground to feed the fire water storage tank, this pipe will be approximately 610m in length with six inch diameter. It will be laid between the Site of the Designated

Development and the existing onsite water reservoir positioned to the east of the existing Tarbert Power Station.

### **2.3.7 Distillate Fuel**

The distillate will be stored in three new fuel storage tanks located on the northern section of the Site and six containerised tanks to the southeast of these proposed storage tanks. The fuel will be forwarded from the storage tanks to the turbine units, sections of which will be in an above ground gantry.

The overhead gantry is sufficiently high over internal access roads as not to impede vehicle access within the Site.

### **2.3.8 Administration Building**

Administration building and facilities associated with the Designated Development will be located to the east of the three turbines units and new substation. These will be used for the management of the temporary emergency generation plant.

### **2.3.9 Site Access and Internal Access Roads**

The existing site access off N67 will be used for construction personnel, traffic, and the existing power station staff. Security fencing, CCTV and other security measures including external lighting will be installed within the Site, for health, safety, and security purposes.

Internal roadways will be hard surfaced with drainage systems to manage surface water runoff and pollution risk.

### **2.3.10 Security Fencing, Gates, and Boundary Treatments**

The perimeter of the entire Power Station Site is surrounded by fencing and barbed wire. There will also be additional security fencing around specific areas of the Site for added security and safety of the equipment.

### **2.3.11 Surface and Foul Water Drainage**

The Designated Development will be located west of the existing Tarbert Power Station, and a drainage system will be provided for surface water which will be directed into a site drainage system which is fitted with oil interceptors. There will be segregated and bunded areas for fuel offloading and storage within the Site.

Areas where there is a chance of potential oil leakage i.e., fuel oil areas, GSUT area, GT area, will be connected to oil water separator (oil interceptor). Balance clean area shall be connected to existing estuary discharge along with treated water from oil water separator.

In the event of an incident, for example a spillage, firewater runoff will be retained on Site through kerbing, bunding and closure of drainage systems in accordance with the requirements of the IE Licence and COMAH.



### **2.3.12 Lighting**

The external lighting scheme will be designed to provide safe working conditions in all areas of the Site whilst reducing light pollution and the visual impact on the local environment. This will be achieved by the use of luminaires that eliminate the upward escape of light.

### **2.3.13 Contractor Compounds**

The construction and laydown areas will be located within the Site, one is located in a zone known as 'Area A', immediately west of the existing Power Station, another in an area north of 'Area A' towards Tarbert Lighthouse, both of these construction compounds are northeast of the Designated Development Site. There will also be a construction compound to the east of existing Power Station on an area of present hardstanding.

The principal contractor will be responsible for securing these areas with temporary fencing, set up of initial site accommodation and welfare facilities, and connections into the existing services on the Tarbert Power Station Site. To ensure site security there will be a single point of entry to the Site for all construction personnel.

Construction access to the Site will be from the existing site accesses from the N67.

It is expected that the extent of HGV movements will vary at different stages of the construction works in response to the activities taking place at any given time. Typical levels during the construction phase are expected to be above the operational level.

### **2.3.14 Grid Connection**

As part of the Designated Development a new substation will be constructed adjacent to the temporary emergency generation plant. This substation will be connected to the existing 220kV EirGrid substation to the east of the Designated Development (within the red line boundary and the existing Tarbert Power Station Site) via an underground cable circa. 560m in length. Minor works will be required at the existing EirGrid substation to facilitate the connection of the Designated Development, including upgrades to one of the existing substation bays.

## 3. Description of Works

### 3.1 Introduction

This section of the Environmental Report provides a description of the construction, operational, and decommissioning phase activities associated with the Designated Development at Tarbert Power Station.

There will be no dismantling or demolition apart from those related to the decommissioning works required on the Designated Development Site at the end of its use.

### 3.2 Pre-Construction Works

The pre-construction phase of development includes preparatory works and consultation with statutory bodies (Health and Safety Authority (HSA), EPA etc). Following this process, site clearance activities will commence. Activities will include preparation of the construction working area, laydown area and site clearance as required.

The Site has been in use for electricity generation for many years and its history of use is well known and documented. A number of areas of the Site will require excavation for construction purposes. In addition to previous studies carried out, soil in these areas will be tested in advance of or during the construction phase to identify the appropriate waste classification which will determine the appropriate route for disposal.

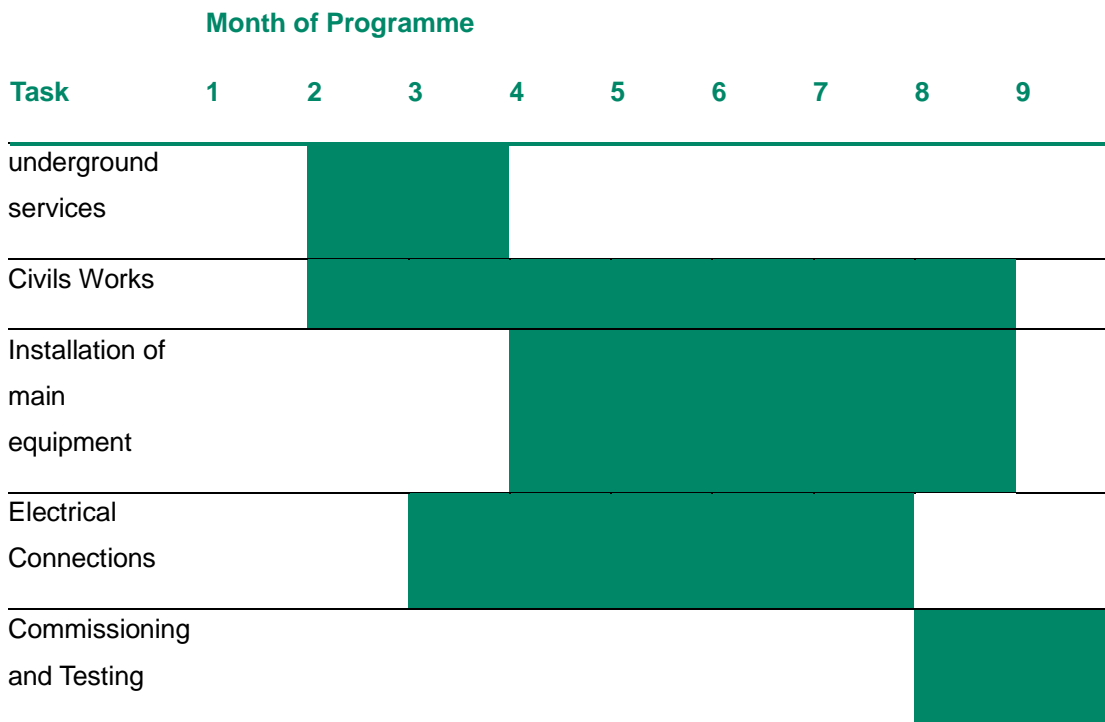
### 3.3 Construction Phase Description and Duration

Construction activities will progress from site set up and preparation, to construction and modular assembly works of the various components, followed by commissioning and testing of the Designated Development.

The preliminary works are scheduled to commence in March 2023, with initial site access and set up, pre-construction works, ground works, piling and construction of plant equipment. The construction programme and commissioning are expected to be completed within approximately nine months see Table 3.1 for an indicative programme.

**Table 3-1:** Indicative Construction and Commissioning Programme

	Month of Programme								
Task	1	2	3	4	5	6	7	8	9
Site Access - Enabling and Preparation									
Groundworks associated with									



All waste arisings will be managed in accordance with legislation and regulations in place and are detailed in the Section 4.13 of this document.

### 3.3.1 Site Management – Construction Hours, Staffing, Access, and Parking

The appointed Contractor will confirm the duration of construction phase works in the Contractor’s Construction Environment Management Plan (CEMP). The Final CEMP will be agreed with Kerry County Council (KCC).

#### Construction Hours

To address the urgent need to install the temporary emergency generation power plant, construction phase works will take place over a minimum of two eight hour shifts and on occasions, three eight hour shifts per day, seven days a week, during construction and commissioning phases, acting in full compliance with Irish labour and Health and Safety laws.

#### Staffing / Employment

Construction staff numbers will vary throughout the duration of the construction phase of the Designated Development, it is estimated that construction staff numbers will peak at approximately 200 personnel. Staff will comprise engineering, management, skilled and semi-skilled workers during the nine-month construction programme.

#### Site Access

Access for construction phase traffic will be available via the two existing retained entrances to the Tarbert Power Station off the N67. Direct access to the Designated Development Site will be via a site gate and the existing internal roadways.

#### Parking

There will be specific on-site parking locations for staff vehicles, separate from construction vehicles and laydown areas.

### **3.3.2 Construction Compounds / Laydown Areas**

Construction compound areas are all contained within the Site, and include a zone known as 'Area A' which is located northeast of the Designated Development, an area to the north of this which is in closer proximity to the lighthouse, and an existing area of hardstanding to the east of Tarbert Power Station. These areas will provide separate space for the storage of equipment, plant and materials associated with the Designated Development.

The construction compounds and laydown areas will not be for long-term storage of materials and storage but will be for the duration of the construction phase only.

### **3.3.3 Health and Safety**

All works shall be carried out in a safe manner and in compliance with all the requirements of the Safety and Health at Work Act 2005, Health and Welfare at Work (Construction) Regulations (S.I. No. 291 of 2013).

### **3.3.4 Pre-construction works**

The pre-construction phase of the works is expected to include preparatory works and site clearance activities. The typical activities will include preparation of the construction working area, laydown areas and site clearance.

### **3.3.5 Ground works and excavation**

Ground investigations are programmed to commence and will be completed as soon as possible. These investigations will provide detailed data to inform the existing ground conditions on this section of the Site and inform ground works required for the Designated Development including excavations and foundations. The identified existing below ground services connections across the Site include - a 10kV voltage cable and a fire water pipe – which will both be rerouted to the perimeter of the Site for the Designated Development to be constructed safely.

### **3.3.6 Concrete works**

Concrete works are proposed to commence following completion of ground investigation, detailed design, and initial ground works of rerouting of any identified existing below ground services. The depth of the concrete works will be informed by the completion of the ground investigation works during the design phase and are expected to be between 1.5m – 30m depth.

### **3.3.7 Piling**

Piling works may be required on Site for the Designated Development, if they are required, they will be scheduled, the piling method selected and works closely monitored in relation to noise and vibration due to proximity of neighbouring residents and ecological receptors. Appropriate mitigation includes the choice of piling method, the distance piling can be undertaken from the designated ecological receptor and seasonal restrictions on piling works, as set out in the NIS (AECOM, February 2023). These works will be managed through the CEMP, to reduce any potential significant impacts. Impact and vibration

piling have been assessed as piling options to be employed on Site, these have been assessed to consider a depth range of 1.5 - 30m.

### 3.3.8 Plant Construction Works

The Main Contractor will be responsible to SSE for the design and installation of the emergency generation plant. Most of the new equipment will be skid mounted or containerised elements fabricated off site and delivered finished or ready for final assembly on Site.

## 3.4 Construction Traffic

The majority of construction traffic is expected to be generated between month one and month seven of the Construction Programme of the project. Based on development of a similar nature, it is estimated that there will be up to 15 HGVs arrivals per day (30 two-way movements) associated with delivery of goods and equipment.

In addition to these trips, there are also expected to be a maximum of 80 HGV arrivals (160 two-way trips) associated with cut and fill movements. These trips will occur during months two and four.

It is estimated that a number of abnormal load deliveries will also be required during the construction phase of the project. The emergency generation plant and equipment will be shipped to Ireland, possibly to Foynes Port in Co. Limerick, which is to the approximately 28km east of the Site and then transported on road via the N69 and N67. This would reduce road traffic where possible. The expected abnormal loads are:

- 3 x gas turbine units;
- 7 x control modules;
- 3 x generator circuit breakers;
- 3 x generators;
- 3 x 30m turbine stacks;
- 2 x Generator Step-up Transformers;
- 1 x raw and fire water storage tank;
- 1 x demineralisation water storage tanks; and
- 3 x liquid fuel storage tanks.

More details on Abnormal Loads are provided in the Framework CTMP, see Appendix C.

The existing entrance from the N67 will be used to access the Site during the construction phase of works. Traffic control will be used to and from Site as required, managed by an allocated member of the construction team.

The number of construction workers required during the construction phase is expected to peak at approximately 200 persons. Staff are expected to travel to Site via a combination of carsharing and private passenger vehicles with approximately 50 staff vehicles movements during the peak construction staffing periods.

A mobile crane is likely to be required on Site for part of the construction works.

## 3.5 Testing and Commissioning

Construction activities will gradually phase from pre-construction site preparation to predominantly construction and modular assembly works followed by commissioning and testing of the Designated Development.

The Contractor will be appointed to the role of Project Supervisor Construction Stage (PSCS) for the installation, commissioning and testing of all equipment including the gas turbines.

## 3.6 Operational Phase

### 3.6.1.1 Industrial Emissions (IE) Licence

The Site of the Designated Development will be operated, maintained, and managed by SSE. The plant will be attended by up to five operation staff (day-time) and two staff (night-time) seven days a week. Operational staff will be responsible for controlling the generation plant in accordance with strict conditions on how any activity must operate so as to protect the environment from pollution that might otherwise arise. The Designated Development will operate under an IE licence regulated by the EPA. Refer to section to Section 1.7 of this report.

### 3.6.1.2 Fuel

The Designated Development will be fired on distillate oil which will be delivered to the Site by road tanker and offloaded at one of the two unloading pumps. This area is designed to contain any spillages that may occur during offloading from the road tankers.

The distillate oil will be stored in the three circular storage tanks positioned on the north-western section of the Site, each with a storage capacity of 100m<sup>3</sup>. Refer to Section 2.3 of this report.

### 3.6.1.3 Operational Staff

The Site of the Designated Development will be operated, maintained, and managed by SSE. The plant will be attended by up to five operation staff (day-time) and two staff (night-time) seven days a week. Operational staff will be responsible for controlling the generation plant and responding to calls from the system operator to start and stop the plant.

### 3.6.1.4 Operational Phase Traffic

During the operational phase, it is anticipated that the Designated Development will run primarily on distillate oil only. Distillate oil will be delivered to the Site by road tanker and offloaded via either of two unloading modules.

### 3.6.1.5 Operational Maintenance

Scheduled maintenance of the three gas turbines will be undertaken on a phased basis. Maintenance requirements will be dependent on the operating profile of the plant but are expected to occur annually and take approximately three days depending on the level of maintenance required.

Given the low number of operating hours per annum (500 hours), unscheduled maintenance due to plant breakdown will be minimal. Maintenance will be carried out by a trained crew in accordance with the procedures specified by the manufacturer and contractor. A maintenance crew of approximately three persons will attend Site in such instances.

Waste materials generated on Site will be domestic such as paper and food waste from the personnel on Site, non-hazardous such as clean metal and wood waste from delivery pallets and hazardous waste oils and greases generated from the operation of the plant.

All waste will be appropriately segregated and will be collected by suitably licenced waste contractors for disposal and in accordance with the IE licence and the Waste Management Act 1996, as amended and associated Regulations.

#### **3.6.1.6 Safety, Health and Environment – Emergency Planning**

Site-specific Health and Safety (H&S) measures will be prepared and will include commissioning procedures to ensure compliance with relevant health and safety legislation.

Measures to prevent or reduce the risk of emergency situation (fires, spillages, floods) and other major incidents will be embedded in the design of the Designated Development.

Operational procedures will be in place that will clearly outline responsibilities and the appropriate communication channels for operational staff/site personnel. Operational staff will receive the appropriate training required for their role, including immediate reaction or assistance for emergency situations. These operational procedures will be included in the Stations Management Systems procedures and will be monitored for effectiveness by the Station Management.

## **3.7 Decommissioning**

The operational life of the Designated Development is anticipated to be up to five years. After this time, the temporary emergency generation plant will be disconnected, dismantled, and removed from the Site.

Remaining equipment such as pipework, cabling and storage tanks will be made safe and retained for potential future use on Site. Equipment will be stored under appropriate conditions and the Site, and all associated structures will be secured. All lubricating oils and other potentially polluting materials will be removed from Site.

Waste materials generated during the decommissioning phase will be removed from Site.

The activities associated with the decommissioning phase of the project will be similar to those associated with the construction phase.

## 4. Environmental Effects and Management

### 4.1 Introduction

This section of the Environmental Report is an environmental overview of each of the relevant technical topics and considers the likely main effects on the environment at the construction and operational phases which are necessary to facilitate the Designated Development. As noted in section 3.7, the effects from the decommissioning phase of the Designated Development will be similar to those associated with the construction phase and are not separately assessed in this report.

This report includes relevant environmental information to the extent that this information was reasonably available to the Applicant at the time of the application and within the reporting timeframe available in the context of the Designated Development. Given the nature of the Designated Development, air quality and noise effects are considered to be those that require more detailed analysis and are addressed first within this report.

All mitigation measures outlined within this Environmental Report will be implemented in full by the appointed Contractor prior to works commencing on-site. The mitigation measures outlined in this report should be read in conjunction with any other reports produced for the Designated Development and are detailed within the Framework CEMP (Appendix B). Any updates will be in accordance with any relevant planning conditions which apply to the Designated Development.

### 4.2 Air Quality

#### 4.2.1 Introduction

This section reports the assessment of the impact of emissions to air from the operation of the three 50MW Temporary Emergency Generation units at the Site. It considers the impact of emissions on sensitive nature conservation habitats and selected human health receptors within a 15km radius of the Site.

It is anticipated that during the construction phase of the Designated Development, construction activities will have the potential to generate dust and finer particulate emissions that could adversely affect sensitive receptors located close to the Site boundary, and receptors located close to public roads used by construction traffic. The assessment considers the potential for impacts from emissions to air during the construction phase, based on the assumption that construction dust can be appropriately controlled by the application of best practice dust mitigation which will be implemented, which is standard practice on all well managed construction sites across the country. The construction vehicle movements will be of a frequency and duration that such emissions are unlikely to put an Air Quality Standard (AQS) or Environmental Assessment Level (EAL) at risk of an exceedance.

During the operational phase, the Designated Development will be a source of nitrogen oxides (NO<sub>x</sub>), nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), carbon monoxide (CO), particulate matter with an aerodynamic diameter of <10µm in diameter (PM<sub>10</sub>) and particulate matter with an aerodynamic



diameter of <2.5µm in diameter (PM<sub>2.5</sub>) emissions, which have the potential to harm species of flora at nearby habitats and nearby human health receptors. Dispersion modelling of emissions is therefore required to predict the contribution of site emissions to annual mean NO<sub>x</sub>, annual mean and hourly mean (99.79<sup>th</sup> percentile) concentrations of NO<sub>2</sub>, hourly mean, 24-hour mean and annual mean SO<sub>2</sub>, 8-hour rolling CO concentration, annual mean and 24-hour mean of PM<sub>10</sub>, and annual mean of PM<sub>2.5</sub>. This assessment also considers the annual rate of nitrogen deposition at the nearest relevant sensitive ecological receptors within 15km of the Site.

The predicted pollutant contribution and total concentrations at selected receptors have been compared with relevant Air Quality Standards (AQSs) and environmental assessment levels (EALs) to determine the magnitude of impact and subsequent effects.

#### 4.2.2 Legislation and Policy

##### National Air Quality Standards

The National Air Quality Standards<sup>5</sup> (Government of Ireland, 2011) were transcribed from the following EU legislation:

- European Union (EU) air quality legislation is provided within Directive 2008/50/EC (Clean Air for Europe (CAFE))<sup>6</sup>, which came into force on 11<sup>th</sup> 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<sub>2.5</sub>). The consolidated Directives include:
  - Directive 99/30/EC - the First Air Quality ‘Daughter’ Directive - sets ambient Air Quality Limit Values (AQLVs) for NO<sub>2</sub>, oxides of nitrogen (NO<sub>x</sub>), sulphur dioxide, lead and particulate matter with an aerodynamic diameter of less than 10µm (PM<sub>10</sub>);
  - 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. 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 4.1.

**Table 4-1: Relevant Air Quality Standards (AQS)**

Averaging Period	Air Quality Standard (µg/m <sup>3</sup> )
Annual mean NO <sub>2</sub> concentration	40

<sup>5</sup> Government of Ireland (2011) *Air Quality Standards Regulations* <https://www.irishstatutebook.ie/eli/2011/si/180/made/en/pdf>

<sup>6</sup> Council for European Communities (2008) *Ambient air quality and cleaner air for Europe Directive, 2008/50/EC*

Averaging Period	Air Quality Standard ( $\mu\text{g}/\text{m}^3$ )
Annual mean NO <sub>x</sub> concentration	30 <sup>1</sup>
1-hour NO <sub>2</sub> concentration	200
Annual mean SO <sub>2</sub> concentration	20 <sup>1</sup>
1-hour SO <sub>2</sub> concentration	350
24-hours SO <sub>2</sub> concentration	125
Max 8-hours CO concentration	10,000
Annual PM <sub>10</sub> concentration	40
24-hours PM <sub>10</sub> concentration	50
Annual PM <sub>2.5</sub> concentration	25

<sup>1</sup>Applicable only at ecologically sensitive receptors.

In addition to the relevant AQSs outlined in Table 4.1, the impacts at ecological receptors have also been assessed against appropriate Environmental Assessment Levels (EALs) for nitrogen deposition, referred to as Critical Loads (CL). The CLs reported in Table 4.2 have been sourced from the Air Pollution Information System (APIS)<sup>7</sup> based on habitats identified within the relevant Conservation Objective Reports<sup>8,9</sup>.

**Table 4-2: Relevant Environmental Assessment Levels**

Habitat	Critical Nitrogen load (kg/N/hr/yr)
Coastal saltmarshes	20
Molinia meadows	15
Woodland	10
Perennial Vegetation of Stony Banks	8
Bogs	5

### 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<sup>10</sup>;
- European Communities (Birds and Natural Habitats) (Amendment) Regulations 2015<sup>11</sup>;
- European Union (Industrial Emissions) Regulations 2013 S.I. 138 of 2013<sup>12</sup>;

<sup>7</sup> APIS (2016) *Habitat/species pollutant impacts database* <https://www.apis.ac.uk/search-pollutant-impacts>

<sup>8</sup> National Parks and Wildlife Services (NPWS) (2022) *Special Protection Areas (SPA)* <https://www.npws.ie/protected-sites/spa>

<sup>9</sup> National Parks and Wildlife Services (NPWS) (2022) *Special Areas of Conservation (SAC)* <https://www.npws.ie/protected-sites/sac>

<sup>10</sup> European Union (Environmental Impact Assessment) (Environmental Protection Agency Act 1992) (Amendment) Regulations 2020. <https://www.irishstatutebook.ie/eli/2020/si/191/made/en/pdf>

<sup>11</sup> European Communities (Birds and Natural Habitats) (Amendment) Regulations 2015.

<https://www.irishstatutebook.ie/eli/2015/si/355/made/en/pdf>

<sup>12</sup> European Union (Industrial Emissions) Regulations 2013. <https://www.irishstatutebook.ie/eli/2013/si/138/made/en/pdf>

- Environmental Protection Agency (Industrial Emissions) (Licensing) Regulations 2013 S.I. 137 of 2013<sup>13</sup>; and
- European Communities (Birds and Natural Habitats) Regulations 2011<sup>14</sup>.

### National Planning Policy

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)<sup>15</sup>, 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.'*

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<sup>16</sup>. This document is focused on Ireland's long-term economic, environmental, and social progress up to 2027, and references improvements in air quality as an additional benefit to improving energy efficiency for the primary purpose of reducing carbon emissions.

### Local Planning Policy

Kerry County Development Plan<sup>17</sup> 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 KCDP

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<sup>13</sup> Environmental Protection Agency (Industrial Emissions) (Licensing) Regulations 2013.

<https://www.irishstatutebook.ie/eli/2013/si/137/made/en/pdf>

<sup>14</sup> European Communities (Birds and Natural Habitats) Regulations 2011.

<https://www.irishstatutebook.ie/eli/2011/si/477/made/en/pdf>

<sup>15</sup> Government of Ireland (2019) *National Planning Framework*.

<https://www.gov.ie/pdf/?file=https://assets.gov.ie/166/310818095340-Project-Ireland-2040-NPF.pdf>

<sup>16</sup> Government of Ireland (2021) *National Development Plan (2021 – 2030)*

[file:///C:/Users/ReevesI/Downloads/200358\\_a36dd274-736c-4d04-8879-b158e8b95029.pdf](file:///C:/Users/ReevesI/Downloads/200358_a36dd274-736c-4d04-8879-b158e8b95029.pdf)

<sup>17</sup> Kerry County Council (2022) Kerry County Development Plan 2022-2028 Volume 5

<http://docstore.kerrycoco.ie/KCCWebsite/planning/devplan/vol5updatednew.pdf>

## 4.2.3 Methodology

### 4.2.3.1 Construction Emissions

The construction work proposed has the potential to generate emissions from construction activities, site plant and non-road mobile machinery.

A qualitative assessment has been undertaken in line with Institute of Air Quality Management (IAQM) guidance<sup>18</sup>. The approach set out in the guidance is to identify the level of mitigation required, based on the likely magnitude of emissions generated by the work and the sensitivity of the area to the impact of such emissions, to ensure that that effect of emissions is not significant.

It is predicted that the construction and decommissioning phases of the Designated Development will lead to an increase of 186 two-way Heavy Goods Vehicle (HGV) movements per day and 100 two-way car movements per day. This is 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<sup>19</sup>. This screening criteria (as outlined in section 4.9.3.4 of the TII guidance) is as follows:

- Road alignment will change by 5m or more; or
- Annual average daily traffic (AADT) flows will change by 1,000 or more; or
- Heavy goods vehicle (HGV) (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 both the HGV and AADT vehicle movements are well below the relevant criteria and the fact that these will access the Designated Development along the existing 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.

### 4.2.3.2 Operational Phase Emissions

The assessment of operational phase emissions has made use of the current version of the Atmospheric Dispersion Modelling System ADMS 5 (version 5.2.4), published by Cambridge Environmental Research Consultants (CERC). ADMS 5 is software approved for use by the EPA 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 this section.

## Source Emissions Data

Source characteristics and emissions data has been obtained from information provided by the Applicant's design team. Information provided has included proposed stack emissions monitoring reports. This information has been scrutinised and data relevant to the dispersion modelling assessment

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<sup>18</sup> Holman et al (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>

<sup>19</sup> TII (2022) Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Development [PE-ENV-01106 \(tiipublications.ie\)](https://www.tiipublications.ie)

extracted and used as model input data, as listed in Table 4.3. Stack locations are illustrated on Plate 4.1.

**Table 4-3: ADMS 5 Model Source Input Data**

Source	Gas Turbine 1 (GT 1)	Gas Turbine 2 (GT 2)	Gas Turbine 3 (GT 3)
Stack location X	107145	107118	107090
Stack location Y	149454	149466	149479
Release heights (m)	30	30	30
Stack diameter (m)	4.0	4.0	4.0
Exit Velocity (m/s)	15	15	15
Exhaust Mass Flow (kg/s)	138.1	138.1	138.1
Temperature (°C)	451.6	451.6	451.6
Exhaust Volume Flow (Nm <sup>3</sup> /h)	392636	392636	392636
NO <sub>x</sub> Emission conc. (mg/Nm <sup>3</sup> )	90.0	90.0	90.0
CO Emission conc. (mg/Nm <sup>3</sup> )	100.0	100.0	100.0
PM <sub>10</sub> Emission conc. (mg/Nm <sup>3</sup> )	17.0	17.0	17.0
SO <sub>2</sub> Emission conc. (mg/Nm <sup>3</sup> )	66.0	66.0	66.0
Emission rate (g/s NO <sub>x</sub> )	9.8	9.8	9.8
Emission rate (g/s CO)	10.9	10.9	10.9
Emission rate (g/s PM <sub>10</sub> )	1.9	1.9	1.9
Emission rate (g/s SO <sub>2</sub> )	7.2	7.2	7.2

<sup>1</sup>Stack locations are in Irish National Grid



**Plate 4.1: Proposed location of the three stacks on the Site.**

**Notes:** Stacks (emission release points) shown as numbered red points

### Cumulative Source Emissions Data

In addition to the Designated Development's sources, cumulative sources from the surrounding area have also been modelled for  $\text{NO}_x$  and  $\text{NO}_2$ . The cumulative sources included within this assessment are Shannon LNG, Moneypoint Power Station, and Tarbert Power Station. Although Tarbert Power Station is due to close by the end of 2023, it is possible that there will be up to five weeks of operational overlap between the Designated Development and Tarbert Power Station, so this has been included within the cumulative assessment. Source characteristics and emissions data has been obtained from information provided by the Applicant's design team, 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 4-4. Stack locations are illustrated in Plate 4.1. It should be noted that only  $\text{NO}_2$  and  $\text{NO}_x$  cumulative impacts have been considered as part of this assessment, to account for the worst-case scenario.

**Table 4-4: Cumulative Sources ADMS 5 Model Source Input Data**

Source	Tarbert Power Station	Money Point Power Station			Shannon LNG <sup>2</sup>							
	Unit 3	A1-1	A1-3	Aux. Boiler	FSRU Main Engine 1_NG	FSRU Main Engine 2_NG	FSRU Main Engine 3_NG	FSRU Main Engine 4_NG	FSRU Main Engine 1_LF	FSRU Main Engine 2_LF	FSRU Main Engine 3_LF	FSRU Main Engine 4_LF
Stack location X <sup>1</sup>	107616	103503	103637	103549	102932	102931	102931	102930	102932	102931	102931	102930
Stack location Y <sup>1</sup>	149543	151696	151646	151802	149328	149332	149336	149340	149328	149332	149336	149340
Release heights (m)	152	220	220	3	50	50	50	50	50	50	50	50
Stack diameter (m)	3.7	6.89	6.89	0.45	1.07	1.13	1.13	1.13	1.07	1.13	1.13	1.13
Exit Velocity (m/s)	13.11	28.94	14.47	11.8	17.1	18.9	18.9	18.9	9.98	12.2	12.2	12.2
Exhaust Mass Flow (kg/s)	-	-	-	-	-	-	-	-	-	-	-	-
Temperature (°C)	140	72	72	200	303	319	319	319	284	297	297	297
Exhaust Volume Flow (Nm <sup>3</sup> /h)	177.26	666.67	333.33	0.97	-	-	-	-	-	-	-	-
NO <sub>x</sub> Emission conc. (mg/Nm <sup>3</sup> )	1100.00	200	200	350	-	-	-	-	-	-	-	-
Emission rate (g/s NO <sub>x</sub> )	194.99	133.33	66.67	0.34	1.95	2.60	2.60	2.60	5.13	5.13	5.13	5.13
Hours per year	840				8322	8322	8322	8322	438	438	438	438

<sup>1</sup>Stack locations are in Irish National Grid

<sup>2</sup>FSRU = Floating Storage Regasification Unit; NG = Natural Gas; LF = Liquid Fuel; CCGT = Combined Cycle Power Plant; LNGC = Liquefied Natural Gas Carriers

**Shannon LNG**

Source	FSRU Regas 1	FSRU Regas 2	FSRU Regas 3	LNGC_NG	LNGC_LF	CCGT 1	CCGT 2	CCGT 3	CCGT 4	CCGT 5	CCGT 6
Stack location X <sup>1</sup>	102922	102922	102923	102937	102937	102263	102282	102348	102368	102434	102453
Stack location Y <sup>1</sup>	149336	149333	149328	149392	149392	148549	148561	148601	148613	148654	148666
Release heights (m)	50	50	50	35	35	35	35	35	35	35	35
Stack diameter (m)	1.47	1.47	1.47	0.6	1.68	3	3	3	3	3	3
Exit Velocity (m/s)	21.4	21.4	21.4	9.3	4.2	19	19	19	19	19	19
Exhaust Mass Flow (kg/s)	-	-	-	-	-	-	-	-	-	-	-
Temperature (°C)	450	450	450	400	316	76	76	76	76	76	76
Exhaust Volume Flow (Nm <sup>3</sup> /h)	-	-	-	-	-	-	-	-	-	-	-
NO <sub>x</sub> Emission conc. (mg/Nm <sup>3</sup> )	-	-	-	-	-	-	-	-	-	-	-
Emission rate (g/s NO <sub>x</sub> )	2.86	2.86	2.86	1.17	2.03	5.63	5.63	5.63	5.63	5.63	5.63
Hours per year of operation	4380	4380	4380	1155	1155	8760	8760	8760	8760	8760	8760

<sup>1</sup>Stack locations are in Irish National Grid

<sup>2</sup>FSRU = Floating Storage Regasification Unit; NG = Natural Gas; LF = Liquid Fuel; CCGT = Combined Cycle Power Plant; LNGC = Liquefied Natural Gas Carriers





Plate 4.2: Modelled cumulative emission locations

## Model Receptors

The model predicts the contribution of emissions of NO<sub>x</sub> and SO<sub>2</sub> to annual mean concentrations at the discrete ecological receptors listed in Table 4.5 and shown in Plate 4.3. Within 15km of the Designated 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) 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 project ecologists. The project ecologists selected coordinates that would be representative of the specific sensitive habitats inside the SAC and SPA areas. Receptor points were modelled at air quality sensitive habitats at the closest point to the Designated Development. Ecological receptors have been modelled at a height of 0m above the ground.

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

- Annual and 1-hour mean NO<sub>2</sub> concentrations
- 1-hour and 24-hour mean SO<sub>2</sub> concentrations
- Rolling 8-hour mean CO concentrations
- Annual and 24-hour mean PM<sub>10</sub> concentrations
- Annual mean PM<sub>2.5</sub> concentrations

Within 15km of the Designated Development, a total of 15 human health receptors have been selected to represent the potential impacts across this area. 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 Designated Development (e.g., on the façade of a residential property).

**Table 4-5: 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	109997	143730	Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA	Bog
E4	104582	135652	Moanveanlagh Bog SAC	Bog



**Plate 4.3: Ecological Receptors**

**Notes:** Location of the Designated Development (three red points), 15km buffer (yellow border), Special Areas of Conservation (SACs) (red hatched areas), modelled ecological receptors (green points)

**Table 4-6: 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



**Plate 4.4: Human Health Receptors**

**Notes:** Location of the Designated Development (three red points), modelled human health receptors (yellow points), 15km buffer (yellow border)

## Background Pollutant Concentrations

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 AQSs and EALs.

Background concentrations were sourced from EPA monitoring data for monitoring locations in EPA Zone D, which is used to represent rural locations. The relevant background concentrations used to inform this assessment are summarised in Table 4.7.

**Table 4-7: EPA Zone D Background Concentrations and Deposition Rate**

Pollutant	Averaging Period	Concentration ( $\mu\text{g}/\text{m}^3$ ) or Deposition Rate ( $\text{kg}/\text{ha}/\text{yr}$ )
NO <sub>x</sub> <sup>3</sup>	Annual mean	14.2
NO <sub>2</sub> <sup>3</sup>	Annual mean	7.5
	1-hr	15.0
SO <sub>2</sub>	Annual mean	4.2
	1-hr	8.4
	24-hr	8.4
N deposition <sup>4</sup>	Annual rate	12.1
CO	8-hr rolling	0.3
PM <sub>10</sub>	Annual mean	11.9
	24-hr	23.8
PM <sub>2.5</sub>	Annual mean	8.7

<sup>1</sup>Average across Zone D monitoring sites taken from summary tables that informed the Air quality in Ireland 2021 report.

<sup>2</sup>Short-term background concentrations are double the annual mean concentrations.

<sup>3</sup>Includes elevated NO<sub>x</sub> concentrations monitored at Birr due to proximity to N52.

<sup>4</sup>National average reported in EPA Research – Development of Critical Loads for Ireland: Simulating Impacts on Systems (SIOS)  
 Author: Julian Aherne, Jason Henry and Marta Wolniewicz.

## Meteorological Data

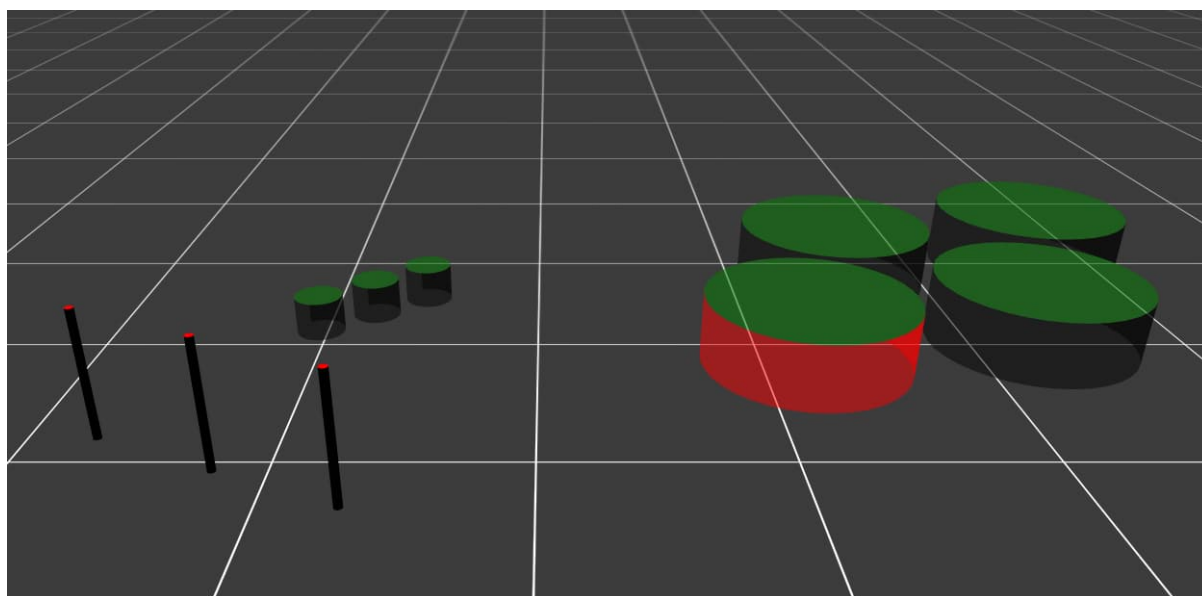
Hourly sequential wind speed, wind direction, precipitation, temperature, and relative humidity data has been sourced from the meteorological station at Shannon Airport, to inform the dispersion modelling. Wind rose plots are discussed in Section 4.2.4 and illustrated in Plate 4.6. Shannon Airport data was selected as being the most representative site to the study area for which data capture (with the exception of cloud cover) was sufficient.

The use of five years of data allows the assessment to consider 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.

## Modelled Buildings and Structures

The buildings and structures around the Site that make up the existing Tarbert Power Station have the potential to affect the dispersion of emissions from the exhaust stacks. The ADMS 5 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 10 stack heights of the emissions source. Therefore, all structures within 300m of the exhaust stacks have been included within the dispersion model, as illustrated in Plate 4.5.



**Plate 4.5: Modelled buildings within ADMS (facing west)**

**Note:** Looking north and showing the generator stacks, proposed storage tanks and existing storage tanks. 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 4.8. The height data was provided by the Applicant's design team.

**Table 4-8. Building Dimensions**

Building	X	Y	Z (m)	Diameter (m)	Shape
Existing Tank 3	107249	149514	16.5	50	Circular
Existing Tank 1	107266	149564	16.5	50	Circular
Existing Tank 2	107324	149577	16.5	50	Circular
Existing Tank 4	107306	149525	16.5	50	Circular
Proposed Tank 1	107130	149531	9.6	12	Circular
Proposed Tank 2	107143	149541	9.6	12	Circular
Proposed Tank 3	107155	149551	9.6	12	Circular

## Terrain Data

Terrain data was sourced from the U.S. Geological Survey, which provides data with a 50m resolution. ADMS 5 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 southwestern 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 Designated Development, however the Shannon Estuary does not have height data and has been assumed as zero, however it is likely to be lower than this. The highest point of the terrain data is 251m above sea level and occurs 17km southwest.

## Pollutant Conversions

### NO<sub>x</sub> to NO<sub>2</sub>

To quantify annual mean NO<sub>2</sub>, it was assumed that 100% of NO<sub>x</sub> emissions released from the stack are converted to NO<sub>2</sub> in the atmosphere. This represents a precautionary approach in that in reality, this conversion is ozone-limited and not all NO<sub>x</sub> emissions will be converted.

Nitrogen deposition was calculated from annual mean NO<sub>x</sub> concentrations.

To quantify 1-hour NO<sub>2</sub>, it was assumed that 50% of NO<sub>x</sub> emissions released from the stack are converted to NO<sub>2</sub> in the atmosphere.

### NO<sub>2</sub> to N Deposition

Annual mean NO<sub>2</sub> concentrations are converted to N deposition using the following factors as set out in EPA guidance:

- Deposition flux (as  $\mu\text{g}/\text{m}^2/\text{s}$ ) is calculated by applying a deposition velocity factor of 0.0015 m/s to the annual mean NO<sub>2</sub> contribution as ( $\mu\text{g}/\text{m}^3$ ) at habitats with short vegetation (non-woodland) and a deposition velocity factor of 0.003 m/s to annual mean NO<sub>2</sub> as ( $\mu\text{g}/\text{m}^3$ ) contribution at habitats with tall vegetation (woodland); and
- Deposition rate (as kgN/ha/yr) is then calculated by applying a unit conversion factor of 95.9 to the calculated deposition flux (as  $\mu\text{g}/\text{m}^2/\text{s}$ ).

### 4.2.3.3 Describing Likely Main Effects on Environment

The EPA EIAR Guidelines<sup>20</sup> do contain a method to determine and describe the effect of a 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 Designated Development is in operation.

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<sup>20</sup> EPA (2022). *Guidelines on the information to be contained in Environmental Impact Assessment Reports*.



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.

### EPA AG4 Approach

The EPA AG4<sup>21</sup> guidance document on dispersion modelling 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.

In its section on *model accuracy and sensitivity studies*, AG4 guidance 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 PEC =  $0.75 \times (\text{AQS} - \text{BC})$  where there is a significant background concentration

### Alternative Approaches

In the UK, the Environment Agency (EA) and IAQM/Environmental Protection UK have both developed guidance to determine whether or not an air quality effect can be screened as insignificant or not by the regulator<sup>22</sup>, or significant or not by the planning authority<sup>23</sup>, respectively.

The UK EA and IAQM/EPUK Guidance provide an alternative and more precautionary approach to determining whether the impact of a Designated 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 Air Quality Standards. 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 also.

The approaches described in these documents have been considered and utilised alongside the EPA AG4 guidance 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 Guidelines*.

### UK EA Approach

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<sup>21</sup> EPA (2019) Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)

<sup>22</sup> UK EA (2016). *Air Emissions Risk Assessment for your Environmental Permit Guidance – Updated 2022*.

<sup>23</sup> Moorcroft and Barrowcliffe. et al., (2017). *Land-use Planning & Development Control: Planning for Air Quality. v1.2*.

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

- The short-term Process Contribution (PC - impact) is  $\leq 10\%$  of the Air Quality Standard or Environmental Assessment Level; and
- The long-term Process Contribution (impact) is  $\leq 1\%$  of the Air Quality Standard or Environmental Assessment Level.

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 PEC is  $< 20\%$  of the Air Quality Standard or Environmental Assessment Level minus the short-term background; and
- The long-term PEC is  $< 70\%$  of the Air Quality Standard or Environmental Assessment Level.

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 Air Quality Standards and Environmental Assessment Levels and the headroom (gap between the PEC and the Standards and Assessment Levels) that remains once the Designated Development is in operation - *i.e.*, is there a risk of an exceedance of an Air Quality Standard and Environmental Assessment Level and/ or does the operation of the Designated Development constrain future development of the area.

For this assessment, the 'insignificant' terminology used in the UK EA guidance<sup>24</sup> applies to effects that can be described as 'Imperceptible' to 'Slight' in the EPA Guidelines<sup>25</sup>. 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 Air Quality Standards and Environmental Assessment Levels remain not at risk of any exceedance.

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, impacts on ecologically sensitive receptors may also be considered insignificant ('not significant') where:

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<sup>24</sup> UK EA (2016). *Air Emissions Risk Assessment for your Environmental Permit Guidance – Updated 2022*.

<sup>25</sup> EPA (2019) Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)

- The long-term PEC is <70% of the Air Quality Standard, Environmental Assessment Level or Critical Load.

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 Air Quality Standards and Environmental Assessment Levels and the headroom that remains once the Designated Development is in operation – *i.e.*, is there a risk of an exceedance of an Air Quality Standard and Environmental Assessment Level and / or does the operation of the Designated Development constrain future development of the area.

Again, the ‘insignificant’ terminology used in the UK EA Guidance applies to effects that can be described as ‘Imperceptible’ to ‘Slight’ in the EPA EIAR Guidelines. It may also apply to effects that can be described as ‘Moderate’ in the EPA EIAR Guidelines, where such effects relate to a limited number of sensitive receptors and/or the Air Quality Standards and Environmental Assessment Levels remain not at risk of any exceedance. Ultimately, the significance of air quality impacts on nature conservation sites shall be determined by a professional ecologist.

### **IAQM / EPUK Approach**

Like the UK EA Guidance, the IAQM/EPUK 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 Air Quality Standards and Environmental Assessment Levels, 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 have published recommendations for describing the impacts at individual receptors, as set out in the Table 4.9.

**Table 4-9: The description of impacts referred to in the IAQM/EPUK Guidance**

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

Notes:

<sup>1</sup> For this assessment, IAQM magnitude of change, descriptions are now aligned with EPA Guidelines as magnitude of effect as follows: Imperceptible = Negligible; Very Low = Low; Low = Low; Medium = Medium; and Large = High.

<sup>2</sup> 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 / 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 Air Quality Standard or Environmental Assessment Level 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 guidance suggests the potential for 'Low' air quality impacts as a result of changes in pollutant concentrations between 2% and 5% of relevant Air Quality Standards and Environmental Assessment Levels. For example, for long-term NO<sub>2</sub> concentrations, this relates to changes in concentrations ranging from 0.6 - 2.1 µg/m<sup>3</sup>. 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 Air Quality Standard or Environmental Assessment Level, 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 it.

The IAQM / EPUK Guidance also provides thresholds for determining whether short-term impacts on human health sensitive receptors have the potential to cause a significant effect or not. 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 ≤10% of the Air Quality Standard or Environmental Assessment Level represents an impact that is 'Imperceptible' to 'Not significant';
- PC 11-20% of the Air Quality Standard or Environmental Assessment Level is small in magnitude representing a 'Slight' impact;

- PC 21-50% of the Air Quality Standard or Environmental Assessment Level is medium in magnitude representing a 'Moderate' impact; and
- PC >51% of the Air Quality Standard or Environmental Assessment Level is large in magnitude representing a 'Significant' to 'Profound' impact.

### Overall Significance

Following the assessment of each individual air quality effect (construction dust, traffic and operational plant), the significance of all of the reported effects is then considered for the Designated Development in overall terms. The potential for the Designated 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 Air Quality Standards and Environmental Assessment Levels (which also relate to compliance with Kerry County Council goals for local air quality management and objectives 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 Designated 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 Air Quality Standards and Environmental Assessment Levels 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 Air Quality Standard or Environmental Assessment Level) to 'Imperceptible' are not considered to be significant.

#### 4.2.4 Baseline Conditions

##### Monitored Baseline

The existing environment has been described with reference to the most recently published EPA Air Quality Report and supplementary data.

The EPA manages the national ambient air quality network, which consists of over 100 monitoring stations located across the country that monitor a range of pollutants, including some of those of relevance to this assessment. The EPA data used to inform this assessment was gathered in 2021 and earlier.

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 during the most recently available report of monitoring 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.

Data gathered across monitoring sites in Zone D over the past few years are summarised in Table 4.6 to Table 4.11 as well as the yearly average across all sites. Any elevated concentrations are due to the

proximity of a monitoring station to a local source of the pollutant being monitored. For example, the highest annual mean NO<sub>2</sub> measurement in 2021 was gathered in Birr. The monitoring station in Birr is located at a roadside location in the middle of the town centre.

The data demonstrates that air quality in Zone D locations is well below the relevant AQs.

**Table 4-10: Annual Mean NO<sub>2</sub> Zone D Monitoring Data**

Year	Emo Court	Birr	Castlebar	Carrick-on-Shannon	Kilkitt	Edenderry	Yearly Average
2021	3.6	12.8	6.3	11.2	2.4	8.8	7.5
2020	4	9	6	17	2	-	7.6
2019	4	-	8	-	5	-	5.7
Site Average	3.9	10.9	6.8	14.1	3.1	8.8	6.9

**Table 4-11: Annual Mean NO<sub>x</sub> Zone D Monitoring Data**

Year	Emo Court	Birr	Castlebar	Carrick-on-Shannon	Kilkitt	Edenderry	Yearly Average
2021	5.2	31.5	10.9	21.9	3.1	12.3	14.2
2020	4.7	23.2	8.9	40.1	2.5	-	15.9
2019	4.8	-	11.1	-	7.6	-	7.8
Site Average	4.9	27.4	10.3	31.0	4.4	12.3	12.6

**Table 4-12: Annual Mean PM<sub>10</sub> Monitoring Data**

Year	Tipperary Town	Carrick-on-Shannon	Enniscorthy	Birr	Askeaton	Macroom	Castlebar	Cobh Carrignafay	Claremorris	Kilkitt	Cavan	Roscommon Town	Edenderry	Mallow	Longford	Cobh Cork Harbour	Yearly Average
2021	12.7	9.4	13.7	12.2	8.7	14.6	9.8	12.0	9.5	7.8	10.6	10.3	17.8	14.7	13.9	13.4	11.9
2020	12	10	15	10	7	15	14	13	10	8	9	11	-	-	-	-	11.2
2019	9	-	18	-	-	28	16	13	11	7	-	12	-	-	-	-	14.3
Site Ave.	11.2	9.7	15.6	11.1	7.9	19.2	13.3	12.7	10.2	7.6	9.8	11.1	17.8	14.7	13.9	13.4	12.5

**Table 4-13: Annual Mean PM<sub>2.5</sub> Zone D Monitoring Data**

Year	Tipperary Town	Carrick-on-Shannon	Mallow	Enniscorthy	Birr	Askeaton	Macroom	Longford	Cobh Carrignafay	Claremorris	Cavan	Roscommon Town	Edenderry	Yearly Average
2021	8.6	5.9	7.9	9.8	7.9	5.7	10.1	9.4	7.4	8.2	7.4	7.1	17.8	8.7
2020	8	7	10	12	6	4	11	9	8	5	6	7	-	7.8
2019	6	-	-	14	-	-	15	9	8	4	-	9	-	9.3
Site Ave.	7.5	6.5	9.0	11.9	7.0	4.9	12.0	9.1	7.8	5.7	6.7	7.7	17.8	8.6

**Table 4-14: Annual Mean SO<sub>2</sub> Zone D Monitoring Data**

Year	Kilkitt	Letterkenny	Cork Harbour	Askeaton	Edenderry	Yearly Average
2021	1.7	10.2	5.5	1.6	1.8	4.2
2020	1.4	11.8	1.8	1.6	-	4.2
2019	0.7	6.8	-	1.8	-	3.1
<b>Site Average</b>	<b>1.3</b>	<b>9.6</b>	<b>3.7</b>	<b>1.7</b>	<b>1.8</b>	<b>3.8</b>

**Table 4-15: Annual Mean CO Zone D Monitoring Data**

Year	Birr
2021	0.3
2020	0.4
2019	-
<b>Site Average</b>	<b>0.4</b>

### Local Meteorological Data

The closest and most representative site of hourly sequential meteorological data to the Designated Development, with adequate data capture for wind speed and wind direction, is the meteorological station at Shannon Airport. This station is approximately 32km to the northeast of the Designated Development.

Plate 4.6 illustrates wind rose plots for five recent calendar years monitored at Shannon Airport. Wind rose plots show the frequency of winds blown for specific sectors and wind speeds. It can be seen that, over the five years presented, winds most frequently blow from the southwest quadrant, which is typical of much of the UK and Ireland.

The use of five years of data allows the assessment to consider 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 52.58°, 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.

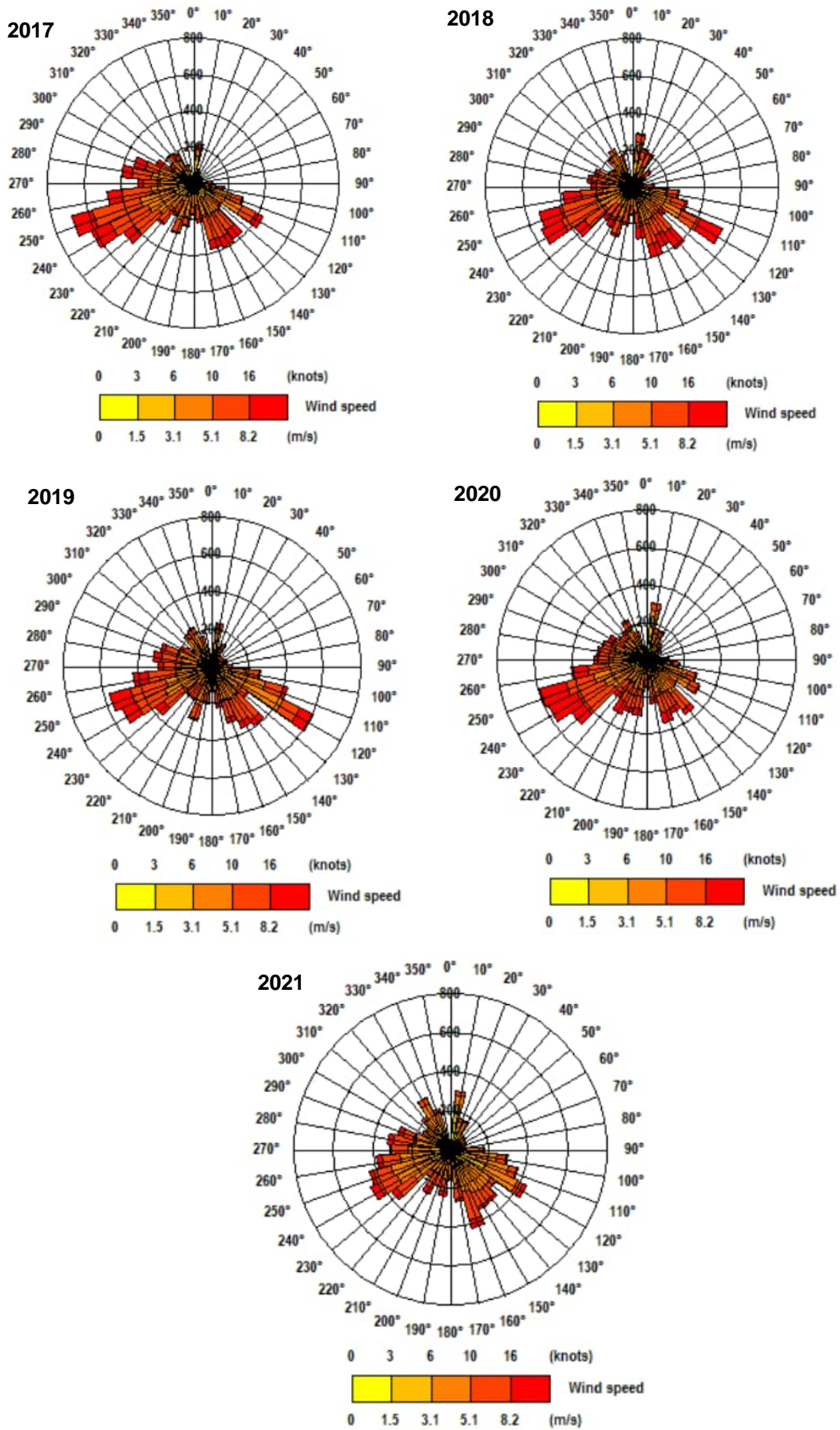


Plate 4.6: Wind Rose Plots



#### **4.2.5 Likely Main Effects on Environment**

This assessment has quantified the contribution of emissions from the three emergency generators to pollutant concentrations at 15 human health sensitive receptors and pollutant concentrations and deposition rates at 15 ecological sensitive receptors. The contribution has been compared to relevant AQSs and 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 then be directly compared to the relevant AQSs and EALs.

The results of the assessment are presented in Table 4.16 to Table 4.19. Table 4.16 details the modelled emissions at the four worst impacted human health receptor locations. Table 4.17 to Table 4.19 show the modelled emissions at all ecological receptor locations. In the tables, the contribution of emergency generator emissions is referred to as the Process Contribution (PC). The total pollutant concentrations, once the PC had been added to the background contribution (BC), is referred to as the Predicted Environmental Concentration (PEC). The PC reported in Table 4.16 to Table 4.19, and subsequent PEC, is based on the maximum impact at each receptor over the five meteorological years modelled.

**Table 4-16. Modelled Emissions at Human Health Receptor Locations**

Receptor ID	Averaging Period	EAL (µg/m <sup>3</sup> )	Tarbert emissions only					Cumulative emissions				
			PC (µg/m <sup>3</sup> )	PC/ AQS (%)	BC <sup>1,2</sup> (µg/m <sup>3</sup> )	PEC (µg/m <sup>3</sup> )	PEC/ AQS (%)	PC (µg/m <sup>3</sup> )	PC/ AQS (%)	BC <sup>1,2</sup> (µg/m <sup>3</sup> )	PEC (µg/m <sup>3</sup> )	PEC/ AQS (%)
<b>Receptor ID R3</b>												
NO <sub>2</sub>	Annual Mean	40	0.1	0.2	7.5	7.6	18.9	1.2	3.0	7.5	8.7	21.8
	1-hr	200	22.5	11.2	15.0	37.5	18.7	26.1	13.0	15.0	41.1	20.5
SO <sub>2</sub>	1-hr	350	32.3	9.2	8.4	40.7	11.6	-	-	-	-	-
	24-hr	125	14.6	11.7	8.4	23.0	18.4	-	-	-	-	-
CO	8-hour Rolling	10,000	55.2	0.6	0.3	55.5	0.6	-	-	-	-	-
PM <sub>10</sub>	Annual mean	40	<0.1	<0.1	11.9	11.9	29.8	-	-	-	-	-
	24-hr mean	50	0.7	1.3	23.8	24.5	48.9	-	-	-	-	-
PM <sub>2.5</sub>	Annual mean	25	<0.1	<0.1	8.7	8.7	34.8	-	-	-	-	-
<b>Receptor ID R4</b>												
NO <sub>2</sub>	Annual Mean	40	0.1	0.2	7.5	7.6	18.9	1.2	3.0	7.5	8.7	21.7
	1-hr	200	21.9	10.9	15.0	36.9	18.4	23.7	11.9	15.0	38.7	19.4
SO <sub>2</sub>	1-hr	350	31.4	9.0	8.4	39.8	11.4	-	-	-	-	-
	24-hr	125	14.8	11.8	8.4	23.2	18.5	-	-	-	-	-
CO	8-hour Rolling	10,000	52.6	0.5	0.3	52.9	0.5	-	-	-	-	-
PM <sub>10</sub>	Annual mean	40	<0.1	<0.1	11.9	11.9	29.8	-	-	-	-	-
	24-hr mean	50	0.9	1.8	23.8	24.7	49.4	-	-	-	-	-
PM <sub>2.5</sub>	Annual mean	25	<0.1	0.1	8.7	8.7	34.9	-	-	-	-	-
<b>Receptor ID R5</b>												
NO <sub>2</sub>	Annual Mean	40	<0.1	<0.1	7.5	7.5	18.8	1.2	2.9	7.5	8.7	21.6
	1-hr	200	7.7	3.9	15.0	22.7	11.4	29.7	14.9	15.0	44.7	22.4
SO <sub>2</sub>	1-hr	350	10.2	2.9	8.4	18.6	5.3	-	-	-	-	-
	24-hr	125	3.4	2.7	8.4	11.8	9.5	-	-	-	-	-
CO	8-hour Rolling	10,000	17.8	0.2	0.3	18.1	0.2	-	-	-	-	-
PM <sub>10</sub>	Annual mean	40	<0.1	<0.1	11.9	11.9	29.8	-	-	-	-	-
	24-hr mean	50	0.1	0.2	23.8	23.9	47.8	-	-	-	-	-
PM <sub>2.5</sub>	Annual mean	25	<0.1	<0.1	8.7	8.7	34.8	-	-	-	-	-

Receptor ID	Averaging Period	EAL (µg/m <sup>3</sup> )	Tarbert emissions only					Cumulative emissions				
			PC (µg/m <sup>3</sup> )	PC/ AQS (%)	BC <sup>1,2</sup> (µg/m <sup>3</sup> )	PEC (µg/m <sup>3</sup> )	PEC/ AQS (%)	PC (µg/m <sup>3</sup> )	PC/ AQS (%)	BC <sup>1,2</sup> (µg/m <sup>3</sup> )	PEC (µg/m <sup>3</sup> )	PEC/ AQS (%)
<b>Receptor ID R15</b>												
NO <sub>2</sub>	Annual Mean	40	<0.1	<0.1	7.5	7.5	18.8	2.3	5.6	7.5	9.8	24.4
	1-hr	200	3.0	1.5	15.0	18.0	9.0	20.0	10.0	15.0	35.0	17.5
SO <sub>2</sub>	1-hr	350	4.3	1.2	8.4	12.7	3.6	-	-	-	-	-
	24-hr	125	1.6	1.3	8.4	10	8.0	-	-	-	-	-
CO	8-hour Rolling	10,000	6.2	0.1	0.3	6.5	0.1	-	-	-	-	-
PM <sub>10</sub>	Annual mean	40	<0.1	<0.1	11.9	11.9	29.8	-	-	-	-	-
	24-hr mean	50	<0.1	0.1	23.8	23.8	47.7	-	-	-	-	-
PM <sub>2.5</sub>	Annual mean	25	<0.1	<0.1	8.7	8.7	34.8	-	-	-	-	-

<sup>1</sup> Average across Zone D monitoring sites taken from summary tables that informed the Air quality in Ireland 2021 report.

<sup>2</sup> Short-term background concentrations are double the annual mean concentrations.

**Table 4-17 Modelled Emissions at Ecological Receptor Locations for NO<sub>x</sub> impacts**

Rec ID	NO <sub>x</sub> Tarbert emissions only					NO <sub>x</sub> Cumulative emissions				
	PC (µg/m <sup>3</sup> )	PC/ AQS (%)	BC (µg/m <sup>3</sup> )	PEC (µg/m <sup>3</sup> )	PEC/ AQS (%)	PC (µg/m <sup>3</sup> )	PC/ AQS (%)	BC (µg/m <sup>3</sup> )	PEC (µg/m <sup>3</sup> )	PEC/ AQS (%)
E1a	<0.01	<0.1	14.2	14.2	47.3	1.27	4.2	14.2	15.5	51.6
E1b	0.05	0.2	14.2	14.2	47.5	1.18	3.9	14.2	15.4	51.3
E1c	0.17	0.6	14.2	14.4	47.9	1.43	4.8	14.2	15.6	52.1
E2a	0.01	<0.1	14.2	14.2	47.4	0.99	3.3	14.2	15.2	50.6
E2b	0.01	<0.1	14.2	14.2	47.4	0.99	3.3	14.2	15.2	50.6
E2c	0.01	<0.1	14.2	14.2	47.4	0.99	3.3	14.2	15.2	50.6
E2d	0.01	<0.1	14.2	14.2	47.4	0.68	2.3	14.2	14.9	49.6
E2e	0.01	<0.1	14.2	14.2	47.4	1.31	4.4	14.2	15.5	51.7
E2f	0.03	0.1	14.2	14.2	47.4	1.17	3.9	14.2	15.4	51.2
E2g	0.01	<0.1	14.2	14.2	47.4	0.91	3.0	14.2	15.1	50.4
E2h	0.01	<0.1	14.2	14.2	47.4	1.42	4.7	14.2	15.6	52.1

Rec ID	NO <sub>x</sub> Tarbert emissions only					NO <sub>x</sub> Cumulative emissions				
	PC (µg/m <sup>3</sup> )	PC/ AQS (%)	BC (µg/m <sup>3</sup> )	PEC (µg/m <sup>3</sup> )	PEC/ AQS (%)	PC (µg/m <sup>3</sup> )	PC/ AQS (%)	BC (µg/m <sup>3</sup> )	PEC (µg/m <sup>3</sup> )	PEC/ AQS (%)
E2i	0.01	<0.1	14.2	14.2	47.4	1.23	4.1	14.2	15.4	51.4
E2j	<0.01	<0.1	14.2	14.2	47.3	0.38	1.3	14.2	14.6	48.6
E3	0.01	<0.1	14.2	14.2	47.4	0.51	1.7	14.2	14.7	49.0
E4	<0.01	<0.1	14.2	14.2	47.3	0.15	0.5	14.2	14.4	47.8

**Table 4-18 Modelled Emissions at Ecological Receptor Locations for Nitrogen Deposition**

Rec ID	Critical Load	N Deposition Tarbert emissions only					N Deposition Cumulative emissions				
		PC (kg/N/ha/yr)	PC/ EAL (%)	BC (kg/N/ha/yr)	PEC (kg/N/ha/yr)	PEC/ EAL (%)	PC (kg/N/ha/yr)	PC/ EAL (%)	BC (kg/N/ha/yr)	PEC (kg/N/ha/yr)	PEC/ EAL (%)
E1a	20	<0.01	<0.1	12.1	12.1	60.5	0.18	0.9	12.1	12.3	61.4
E1b	20	0.01	<0.1	12.1	12.1	60.5	0.17	0.9	12.1	12.3	61.4
E1c	20	0.02	0.1	12.1	12.1	60.6	0.21	1.0	12.1	12.3	61.5
E2a	20	<0.01	<0.1	12.1	12.1	60.5	0.14	0.7	12.1	12.2	61.2
E2b	20	<0.01	<0.1	12.1	12.1	60.5	0.14	0.7	12.1	12.2	61.2
E2c	15	<0.01	<0.1	12.1	12.1	80.7	0.14	0.9	12.1	12.2	81.6
E2d	20	<0.01	<0.1	12.1	12.1	60.5	0.10	0.5	12.1	12.2	61.0
E2e	20	<0.01	<0.1	12.1	12.1	60.5	0.19	0.9	12.1	12.3	61.4
E2f	20	<0.01	<0.1	12.1	12.1	60.5	0.17	0.8	12.1	12.3	61.3
E2g	20	<0.01	<0.1	12.1	12.1	60.5	0.13	0.7	12.1	12.2	61.2
E2h	20	<0.01	<0.1	12.1	12.1	60.5	0.41	2.0	12.1	12.5	62.5
E2i	8	<0.01	<0.1	12.1	12.1	151.3	0.18	2.2	12.1	12.3	153.5
E2j	10	<0.01	<0.1	12.1	12.1	121.0	0.11	1.1	12.1	12.2	122.1
E3	5	<0.01	<0.1	12.1	12.1	242.0	0.07	1.5	12.1	12.2	243.5
E4	5	<0.01	<0.1	12.1	12.1	242.0	0.02	0.4	12.1	12.1	242.4

**Table 4-19 Modelled Emissions at Ecological Receptor Locations for SO<sub>2</sub> impacts**

Rec ID	SO <sub>2</sub> Tarbert emissions only				
	PC (µg/m <sup>3</sup> )	PC/ AQS (%)	BC (µg/m <sup>3</sup> )	PEC (µg/m <sup>3</sup> )	PEC/ AQS (%)
E1a	<0.01	<0.1	4.2	4.2	21.0
E1b	0.04	0.2	4.2	4.2	21.2
E1c	0.12	0.6	4.2	4.3	21.6
E2a	0.01	<0.1	4.2	4.2	21.0
E2b	0.01	<0.1	4.2	4.2	21.0
E2c	0.01	<0.1	4.2	4.2	21.0
E2d	<0.01	<0.1	4.2	4.2	21.0
E2e	0.01	<0.1	4.2	4.2	21.0
E2f	0.02	0.1	4.2	4.2	21.1
E2g	0.01	<0.1	4.2	4.2	21.0
E2h	0.01	<0.1	4.2	4.2	21.0
E2i	0.01	<0.1	4.2	4.2	21.0
E2j	<0.01	<0.1	4.2	4.2	21.0
E3	0.01	<0.1	4.2	4.2	21.0
E4	<0.01	<0.1	4.2	4.2	21.0

The results of the human health assessment provided in **Table 4-16** demonstrate the following:

- The results demonstrate that when the emissions from the Designated Development are considered in isolation, the PC to annual mean NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, and 8-hour CO is less than 1% of the relevant AQSs at the worst affected receptors. The PC to 24-hour PM<sub>10</sub> it is less than 2% of the AQS. The PC to 1-hour SO<sub>2</sub> is less than 10% of the AQS and 24-hour SO<sub>2</sub> is less than 12% of the standard. The PC to 1-hour NO<sub>2</sub> is also less than 12% of the standard.
- With the addition of the BC, the PEC for annual mean NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>, 24-hour mean PM<sub>10</sub>, 8-hour CO and 1-hour SO<sub>2</sub> and NO<sub>2</sub> are well below their respective AQS to the extent that the effect of impacts is not considered significant following EPA AG4, UK EA and IAQM/EPUK guidance.
- 24-hour SO<sub>2</sub> has a PC impact of greater than 10% and a PEC greater 20% of the Air Quality Standard or Environmental Assessment Level minus the short-term background. In line with the EPAAG4<sup>4</sup>, UK EA approach and IAQM/EPUK approach, 24-hour SO<sub>2</sub> cannot be screened as insignificant. However as noted previously, the Designated Development will only operate for a maximum of 500 hours per year. The AQS for 24-hour SO<sub>2</sub> is based on a 125 µg/m<sup>3</sup> concentration not being exceeded more than three times in a calendar year. In this assessment, it has been assumed that the 500 hours of operation could occur on any hour of the calendar year and therefore coincide with the worst hourly meteorological conditions at each receptor. In reality, 500 hours accounts for around 6% of the year and the coincidence of operation occurring during the worst meteorological hours of the year at each receptor is highly unlikely. Hypergeometric analysis of the 24-hour PC for every 24-hour period of the worst meteorological year at R4 has been undertaken to better understand the likely impact. That analysis has demonstrated that on the 4th worst 24-

hour of the year, the probability of the PC being 10% or more of the AQS is 0.014% and the probability of the PEC greater 20% of the Air Quality Standard or Environmental Assessment Level minus the short-term background is 0.06%. This demonstrates that there is very little likelihood of a PC and PEC occurring to the extent that the effect would be significant.

- When the NO<sub>2</sub> impacts from the Designated Development are considered with other cumulative sources in the local area, the PC to annual mean NO<sub>2</sub> is less than 6% of the relevant AQSs at the worst affected receptors. The PC to 1-hour NO<sub>2</sub> is less than 15% of the AQS at the worst affected receptors. With the addition of the BC, the PEC for both annual mean and 1-hour NO<sub>2</sub> are well below their respective AQS to the extent that the effect of impacts is not considered significant following EPA AG4, UK EA and IAQM/EPUK guidance.
- The impacts at human health receptors can therefore be screened as insignificant.

The results of the ecological assessment provided in Table 4.17 to Table 4.19 demonstrate the following:

- When the impacts from Designated Development are considered in isolation, for all of the ecological receptors, the impacts are less than 1% of the AQSs and EALs and can be screened as insignificant. It is clear from the PEC across the range of habitats reported in Table 4-18 that those most sensitive to N deposition are constrained by the background contribution. In terms of N deposition, the Site has no perceptible impacts (<1%) at any SAC or SPA designated habitat.
- However, when the NO<sub>x</sub> impacts from the Designated Development are considered with other cumulative sources in the local area, the worst affected receptor is predicted to experience an annual mean NO<sub>x</sub> PC of 4.8% of the AQS. As the PEC for NO<sub>x</sub> remains well below the AQSs (53%), the impact of this pollutant can be screened as insignificant.
- When the impacts of Nitrogen Deposition from the Designated Development are considered with other cumulative sources in the local area, the majority of receptors still are predicted to have impacts less than 1% of the EALs and can be screened as insignificant. The exception to this occurs at E1c, E2h, E2i, E2j and E3. Receptors E1c, E2j and E3 all experience a nitrogen deposition PC of 1.5% or less of their respective critical loads. Receptor E2h, a large shallow inlets and bays habitat within the Lower River Shannon SAC, to the north-west of the Site experiences a nitrogen deposition PC of 2.0% of the critical load. Whereas Receptor E2i, a perennial vegetation of stony banks habitat within the Lower River Shannon SAC, to the north-west of the Site experiences a nitrogen deposition PC of 2.2% of the critical load.
- With the addition of the BC, receptors E1c and E2h are well below the EAL (61.5% and 62.5% respectively), and the impact of nitrogen deposition can be screened as insignificant at these receptors.
- With the addition of the BC, receptors E2i, E2j and E3 exceed their respective EALs. Receptor E2j is Broadleaved deciduous woodland located within the Lower River Shannon SAC, to the south of the Site, and Receptor E3 is a bog within located Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA to the southeast of the Site. These locations are constrained by the background contribution, which already exceeds the EALs before any contributions of the Designated Development or cumulative sources are considered. As such, at these designated

ecological receptor locations, baseline air pollution is already well in excess of the site-specific critical loads and no new exceedances of the critical load are predicted

- For all ecological receptors it should be noted that the main contribution to the cumulative PC concentrations is plant at Shannon LNG. This development is still going through planning and is not committed yet. It should be noted that when plant for this development is not included, cumulative impacts at all receptors fall below 1% PC.

### **Do Nothing Scenario**

In the absence of the Designated Development, air quality will remain similar to that described in Section 4.2.4.

#### **4.2.6 Construction Phase – Mitigation Measures**

Negative air quality impacts can come from many sources during construction, and as such there are a number of ways in which air quality effects will be minimised by the Contractor to avoid creating nuisance. Works will be planned to take into account the location of sensitive receptors (such as local residents in the vicinity of the Site and the ecological receptors adjacent to the Site), local topography, wind direction, and any potential sources of pollution.

In line with guidance published by the Institute of Air Quality Management (IAQM) (Holman et al, 2014) unmitigated construction phase impacts are most likely to occur:

- up to 350m beyond the Designated Development boundary and 50m either side of the construction traffic route (for a distance of up to 500m from the entrance of the proposed works site), for the identification of human health receptors; and
- up to 50m from the boundary of the proposed works site or either side of the construction traffic route (for a distance of up to 500m from the entrance of the proposed works site) for the identification of ecological receptors.

Mitigation measures will therefore be undertaken so that construction works are carried out in such a manner that emissions of dust and other pollutants are limited, and that best practicable means are employed to minimise disruption, risks to human health, and to avoid unnecessary impacts on ecological habitats. These control measures will be reflected within the Final Construction Environmental Management Plan (CEMP), based on relevant guidance from Section 8.2 of the Guidance on the assessment of dust from demolition and construction (February 2014) for 'Medium Risk' sites. The mitigation measures discussed in Table 4.20 outline those required to avoid, prevent or reduce and, if possible, offset the likely main effects on the environment.

##### **4.2.6.1 Control of Dust**

Dust is generated in many ways during a construction project, various activities can mobilise dust which can then be deposited beyond the site boundary, harming amenity and vegetation, and if particles are small enough, inhaled by site workers, local residents and non-motorised road users. The Contractor will implement measures to prevent disturbance caused by dust preparation of the temporary construction compound, construction, and site clearance (including removal of existing hardstanding). Excavation and earthworks can be potential sources of dust if they are not properly controlled, especially in dry and windy weather. These measures are:

- Activities which have the potential to generate dust will be subject to a risk assessment, taking into account their proximity to sensitive receptors and duration. This allows mitigation and management techniques outlined in Table 4.20 to be implemented before works commence;
- Visual inspections will be undertaken when dust-raising activities are occurring. Inspections will take into account prevailing meteorological conditions, and results will be recorded and maintained. These inspections will take place at least daily during these activities, and will determine the effectiveness of the applied mitigation and management techniques as identified during the risk assessment; and
- Activities will be temporarily suspended if unacceptable levels of dust cannot be avoided, these will be identified through substantiated complaints received from the public and/or surrounding receptors.

Mitigation measures will be incorporated into the CEMP reflecting the requirements of best practicable means refer to Table 4-20. These measures to minimise the amount of dust produced include:

- Dampening haul roads and stockpiles;
- Keeping roads clean; and
- Using covers to minimise dust blow from lorries.

Conversely, wet weather creates potential for mud being carried onto public road network by vehicles entering or exiting the Site. The Site is mostly hardstanding and traffic will be required to use the designated access points on the N67, thus increasing control over construction vehicles exiting Site. Measures implemented to control dust will reflect the nature of the construction activity (type, dust source points, construction operation periods and time of year) as well as ameliorating conditions (such as prevailing wind directions and speeds, typical precipitation, and the dampening effect of retained soil moisture). The methods of reducing and controlling dust emissions during construction are detailed in the following table.

**Table 4-20: Likely Site Activities and Appropriate Methods of Controlling Dust**

Activity	Dust Control Methods
Communication	<ul style="list-style-type: none"> <li>• Develop and implement stakeholder communication measures that include community engagement before work commences on site.</li> <li>• Display the name and contact details of the person(s) accountable for air quality and dust issues on the site boundary</li> <li>• Display the head or regional office contact information</li> <li>• Develop and implement dust management measures as part of the CEMP, which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include, as a minimum, the highly recommended measures in this document. The desirable measures should be included as appropriate for the site.</li> </ul>



## Activity Dust Control Methods

Site Management	<ul style="list-style-type: none"> <li>Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner and record the measures taken</li> <li>Make the complaints log available to the local authority when asked</li> <li>Record any exceptional incidents that cause dust and/or air emissions, either on or off site and the action taken to resolve the situation in the logbook</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results and make the log available to the local authority when asked</li> <li>Carry out regular site inspections, record inspection results and make an inspection log available to the local authority when asked</li> <li>Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions</li> <li>If required, agree dust deposition, dust flux or real-time PM<sub>10</sub> continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks, and construction.</li> </ul>
Preparing and maintaining the Site	<ul style="list-style-type: none"> <li>Plan site layout so that machinery and dust causing activities are located away from receptors as far as possible</li> <li>Erect solid screens or barriers around dusty activities that are at least as high as any stockpiles on site</li> <li>Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period, where possible</li> <li>Avoid site runoff, or water, or mud</li> <li>Keep site fencing, barriers and scaffolding clean using wet methods</li> <li>Remove materials that have a potential to produce dust from site as soon as possible unless being re-used on site</li> <li>Cover, seed, or fence stockpiles to prevent wind whipping,</li> </ul>
Operating vehicle/machinery and sustainable travel	<ul style="list-style-type: none"> <li>Ensure all vehicles switch off engines when stationary – no idling vehicles</li> <li>Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable</li> <li>Impose and signpost a maximum speed limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work area</li> <li>Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).</li> </ul>

## Activity Dust Control Methods

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Operations	<ul style="list-style-type: none"><li>• Only use cutting, grinding, or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays.</li><li>• Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation</li><li>• Use enclosed chutes and conveyors and covered skips</li><li>• Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.</li><li>• Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.</li></ul>
Waste Management	<ul style="list-style-type: none"><li>• Prohibition of bonfires and burning of waste materials on Site</li></ul>
Earthworks	<ul style="list-style-type: none"><li>• Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.</li><li>• Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable</li><li>• Only remove the cover in small areas during work and not all at once.</li></ul>
Construction	<ul style="list-style-type: none"><li>• Avoid scabbling (roughening of concrete surfaces) if possible</li><li>• Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.</li></ul>
Track-out	<ul style="list-style-type: none"><li>• Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.</li><li>• Avoid dry sweeping of large areas.</li><li>• Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.</li><li>• Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.</li><li>• Record all inspections of haul routes and any subsequent action in a site logbook.</li><li>• Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site when reasonably practicable).</li></ul>

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Source: Holman et al (2014). IAQM Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London. [www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf](http://www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf).

#### 4.2.7 Summary

A dispersion modelling assessment has been undertaken on emissions associated with the operation of three 50MWe emergency generators operating for up to 500 hours per year on air quality sensitive Special Area of Conservation (SAC) and Special Protection Area (SPA) habitats and selected human health receptors within 15km.

A dispersion modelling assessment has been undertaken with reference to EPA AG4 guidance. The assessment method has accounted for generator emissions data, five years of representative meteorological data, variation of local terrain, the effect of building downwash from the neighbouring buildings, and representative air quality sensitive receptors.

For human health receptors, the assessment has determined that the impact of the Designated Development and subsequent total pollutant concentrations (PEC) does not result in a significant effect on local air quality. The assessment did identify an elevated PC and PEC for 24-hour SO<sub>2</sub> at a couple of receptors, but this was due to the precautionary nature of that assessment. Further analysis demonstrated that probability of a significant effect occurring was very low. This is also the case for the cumulative assessment.

For ecological receptors, the stand-alone assessment has determined that N deposition rates and annual mean NO<sub>x</sub> and SO<sub>2</sub> are less than 1% of the relevant AQS and EALs at all habitats considered.

However, when the cumulative emissions are considered, all receptors experience >1% PC for annual mean NO<sub>x</sub>, however the PEC are less than 70% of the AQS and are therefore considered insignificant.

The assessment has determined that N deposition rate impacts are below 1% of the EAL at all receptors considered apart from five receptors. These receptors experience less than 2.5% PC impact of the EAL. It should be noted that the main contributor to these impacts comes from Shannon LNG which is currently not been approved at the planning stage. When Shannon LNG's emissions are removed from the results, all N deposition rates are well below 1% of the EAL.

Where these impacts occur, two of the receptors PEC is well below the relevant EAL and the operation of the Designated Development does not put these objectives at risk of an exceedance. For the other three receptors (Broadleaved deciduous woodland and perennial vegetation of stony banks, both located within the Lower River Shannon SAC and a bog within located Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle), the BC already exceeds the relevant EALs. At these designated ecological receptor locations baseline air pollution is already well in excess of the site-specific critical loads and no new exceedances of the critical load are predicted

It is therefore concluded that the air quality impact of the Designated Development can be screened as insignificant at all air quality sensitive SAC and SPA habitats and selected sensitive human health receptors.

## 4.3 Noise and Vibration

### 4.3.1 Introduction

This section provides information in relation to the likely main effects of noise on the environment arising from the construction and operational phase works associated with the Designated Development. Noise and vibration emissions can potentially occur during the construction, operational and decommissioning phases of the Designated Development.

Effects arising from the process of decommissioning of the Designated Development are of a similar or lesser nature and duration to those arising from the construction process and therefore have not been considered separately in this document. Where this assessment refers to potential construction effects, these are also representative of predicted decommissioning effects.

Decommissioning phase noise levels are likely to be broadly similar to, or lower than, those during the construction phase, and therefore the construction phase noise levels are intended to represent a reasonable worst-case assessment.

Potential noise and vibration sources during the construction phase comprise mobile plant and construction processes such as earthworks and piling which can give rise to elevated sound and vibration levels.

Potential noise sources during the operational phase comprise plant and equipment associated with the operation of the power plant. No significant ground borne vibration sources are identified during the operational phase.

Full details on the background, Site history and the Designated Development is provided in **Section 2** (Description of the Designated Development).

### 4.3.2 Legislation, Policy and Guidance

The following outlines the main relevant legislation, policy and guidance that has been referred to in this section:

- **EPA Guidelines 2022:** The Environmental Protection Agency (EPA) *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA,2022) are Guidelines written to facilitate the implementation of Directive 2011/92/EU as amended by EU Directive 2014/52/EU in Ireland. This document covers the assessment and description of environmental impacts.
- **NG4:** *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities* (EPA 2016).
- **NRA Guidelines:** *Guidelines for the Treatment of Noise and Vibration in National Road Schemes* (NRA 2004).
- **BS5228:** *BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites' BS5228.*

Additional references are provided at the end of the section.

### 4.3.3 Methodology

#### Study Area

The study area for assessment of on-site construction noise and vibration and operational noise is defined as an area extending from the Site of the Designated 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 Section 4.12 Traffic Management.

#### Determination of the Baseline Environment

The baseline acoustic environment has been determined from previously undertaken annual permit compliance monitoring around the Site.

#### Describing Likely Main Effects on Environment

With reference to the EPA Guidelines (2022), effects are described under various headings, including Quality, Significance, Extent and Context, Probability, Duration and Frequency. Of particular relevance are the definitions of significance and duration, which are provided in Table 4.21 and Table 4.22 respectively.

**Table 4-21 : Description of Significance of Effects<sup>26</sup>**

Aspect	Description
<b>Imperceptible</b>	An effect capable of measurement but without significant consequences
<b>Not Significant</b>	An effect which causes noticeable changes in the character of the environment but without significant consequences
<b>Slight</b>	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
<b>Moderate</b>	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
<b>Significant</b>	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment
<b>Very Significant</b>	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment
<b>Profound</b>	An effect which obliterates sensitive characteristics

**Table 4-22: Description of Duration of Effects<sup>27</sup>**

Aspect	Description
<b>Momentary</b>	Effects lasting from seconds to minutes
<b>Brief</b>	Effects lasting less than a day
<b>Temporary</b>	Effects lasting less than a year
<b>Short-Term</b>	Effects lasting from one to seven years
<b>Medium-Term</b>	Effects lasting from seven to 15 years
<b>Long-Term</b>	Effects lasting from 15 to 60 years

<sup>26</sup> EPA (2022).

<sup>27</sup> EPA (2022).

Aspect	Description
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

### Significance of Effects: Construction Phase

To determine potential temporary noise and vibration impacts and effects during the construction phase of the Designated Development, the following matters have been considered:

- noise and vibration caused by construction site activities; and
- noise and vibration caused by increases in traffic on existing roads.

### Criteria: Noise from Onsite Construction Activities

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of an industrial project. Control is primarily implemented by constraining construction activities by limiting the hours of operation and authorities may consider noise limits at their discretion.

Transport Infrastructure Ireland (TII)<sup>28</sup> publish construction noise limits, which are presented in the *Guidelines for the Treatment of Noise and Vibration in National Road Schemes*<sup>29</sup> (the “NRA Guidelines”).

It is acknowledged that the limits presented in the NRA Guidelines relate to construction works for road schemes, however, it is assumed that 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 4.23.

**Table 4-23: NRA Maximum Permissible Noise Levels at the Façade of Dwellings During Construction<sup>30</sup>**

Period	L <sub>Aeq,1hr</sub> dB	L <sub>p(max) slow</sub> dB
Monday to Friday - 07:00 to 19:00	70	80
Monday to Friday - 19:00 to 22:00	60 <sup>1</sup>	65 <sup>1</sup>
Saturday - 08:00 to 16:30	65	75
Sundays and Bank Holidays - 08:00 to 16:30	60 <sup>1</sup>	65 <sup>1</sup>

<sup>1</sup> 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 *BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites'* (BS5228).

The ‘ABC’ method (detailed in BS 5228-1 Part 1 Section E.3.2) has been used to develop criteria. Using this method, the construction noise limits for the Designated Development are determined by rounding

<sup>28</sup> formerly the National Roads Authority (NRA)

<sup>29</sup> NRA (2004).

<sup>30</sup> NRA (2004).

the ambient noise levels ( $L_{Aeq,T}$ ) to the nearest 5 dB and then comparing this level to the Threshold Values in Category A, B and C given in BS5228, as reproduced in Table 4.24.

**Table 4-24: BS5228 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 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 residential NSR is predicted, and where the criterion is met no significant effect at the residential NSR is predicted, subject to context considerations.

### 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. Both criterion types are considered relevant to the Designated Development.

Table B.1 of BS 5228- Part 2 presents vibration criteria with regards human perception. These are presented in Table 4.25 with descriptions of likely reactions.

**Table 4-25: BS5228 Vibration Criteria: Human Perception**

Magnitude of impact	Peak Particle Velocity (PPV)	Description
Major	$\geq 10$ mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level.
Moderate	$>1.0$ 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	$>0.3$ mm/s	Vibration might be just perceptible in residential environments.

Magnitude of impact	Peak Particle Velocity (PPV)	Description
Negligible	>0.14 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 ensure there is no potential for vibration damage during construction. These criteria are presented in Table 4.26.

**Table 4-26: 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 50 Hz	50 to 100Hz (and above)
8 mm/s	12.5 mm/s	20 mm/s

### Criteria: Noise from Increased Traffic Flows on Existing Roads during the Construction Period

The potential increase in noise levels resulting from changes to road traffic flows during the construction period may be determined in accordance with the NRA Guidelines which refer to the Calculation of Road Traffic Noise (CRTN) methodology.

The change in noise level for relevant links has been predicted based on the CRTN<sup>31</sup>, Basic Noise Level (BNL) methodology. 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. However, the CRTN methodology is not accurate for very low traffic flows (below 1000 AAWT), and therefore road links with flows lower than this have not been assessed.

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) LA 111 Revision 2*<sup>32</sup>, as presented in Table 4.27.

**Table 4-27: Magnitude of Impact: Construction Phase Traffic<sup>33</sup>**

Magnitude of Impact	Increase in BNL (LA <sub>10,18hr</sub> 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+

### Construction Phase: SPAs, SAC, Candidate Special Areas of Conservation (cSAC) and Other Ecological Receptors

<sup>31</sup> Department of Transport (1998).

<sup>32</sup> Highways England (2020).

<sup>33</sup> Highways England (2020).



The impact of construction phase noise and vibration emissions on habitats and species of candidate Special Areas of Conservation (cSAC) and other ecological receptor positions are discussed in Section 4.4 (Biodiversity).

### Significance of Effects: Operational Phase

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.

### Criteria: Operational Phase Site Noise Emissions

It is anticipated that the Designated Development will be licenced under a new IE Licence, or the existing licence will be altered.

Guidance on permissible noise emission limits for licensed facilities is contained in *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)*<sup>34</sup>. NG4 refers to Best Available Techniques as a form of noise mitigation which is defined in Section 7 of the *Protection of the Environment Act (2003)* as:

*'The most effective and advanced stage in the development of an activity and its methods of operation, which indicate the practical suitability of particular techniques for providing, in principle, the basis for emission limit values designed to prevent or eliminate or, where that is not practicable, generally to reduce an emission and its impact on the environment as a whole.'*

NG4 states that:

*'All reasonably practicable measures should be adopted at licensed facilities to minimise the noise impact of the activity, and BAT 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'.

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:

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<sup>34</sup> EPA (2016). *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities*.

- Average Daytime Background Noise Level  $\leq 40$ dB LAF90;
- Average Evening Background Noise Level  $\leq 35$ dB LAF90, and
- Average Night-time Background Noise Level  $\leq 30$ dB LAF90.

The criteria presented in NG4 are detailed in Table 4.28.

**Table 4-28: Recommended Operational Noise Limit Criteria<sup>35</sup>**

Scenario	Daytime Noise Criterion dB L <sub>ar,T</sub> (0700 to 1900 hours)	Evening Noise Criterion dB L <sub>ar,T</sub> (1900 to 2300 hours)	Night-time Noise Criterion dB L <sub>aeq,T</sub> (2300 to 0700 hours)
Quiet Area	Noise from the licensed site to be at least 10 dB below the average daytime background noise level measured during the baseline survey.	Noise from the licensed site to be at least 10 dB below the average evening background noise level measured during the baseline survey.	Noise from the licensed site to be at least 10 dB below the average night-time background noise level measured during the baseline survey.
Areas of Low Background Noise	45 dB	40 dB	35 dB
All other Areas	55 dB	50 dB	45 dB

The criteria are given in terms of a Rated Noise Level (L<sub>ar,T</sub>) which is defined in NG4 as:

*The Rated Noise Level, equal to the L<sub>Aeq</sub> 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 are described in NG4 and have been considered in this assessment.

The criteria adopted for this operational assessment is discussed in Section 4.3.5.

### 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 have been considered. However, it is understood that operations will not require a large daily workforce or daily deliveries and as such we have scoped out a detailed operational phase traffic Assessment due to the minimal operational traffic associated with the Designated Development.

Given the low number of Designated Development related vehicle movements on existing roads during the operational phase, noise impacts are likely to be **negligible** or less in both the short-term and long-term and therefore no further assessment has been undertaken.

### Operational Phase: SPAs, SAC, cSAC and other Ecological Receptors

The impacts of the operational phase noise emissions on the cSAC and other ecological receptors are discussed in Section 4.4 (Biodiversity).

### Limitations and Assumptions

The following limitations and assumptions apply to the assessment:

- The sound levels measured as part of the annual permit compliance testing for the existing SSE site remain representative of the baseline acoustic environment generally.

<sup>35</sup> EPA (2016). *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities*.

- The precise size, configuration, performance, and layout of the equipment will be finalised by General Electronic (GE), the appointed supplier. For the purposes of this report, GE have provided predicted operational levels at NSRs based on the working design at the time of submission and which will not be exceeded in the detailed design and during operation.
- The calculated noise levels presented in the report have been established using CadnaA 3D noise modelling software which adopts the calculation methodologies detailed in *ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation*, *BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites and the Calculation of Road Traffic Noise*<sup>36</sup>. The assessment is therefore subject to the assumptions and limitations detailed within these standards.

#### 4.3.4 Baseline Environment

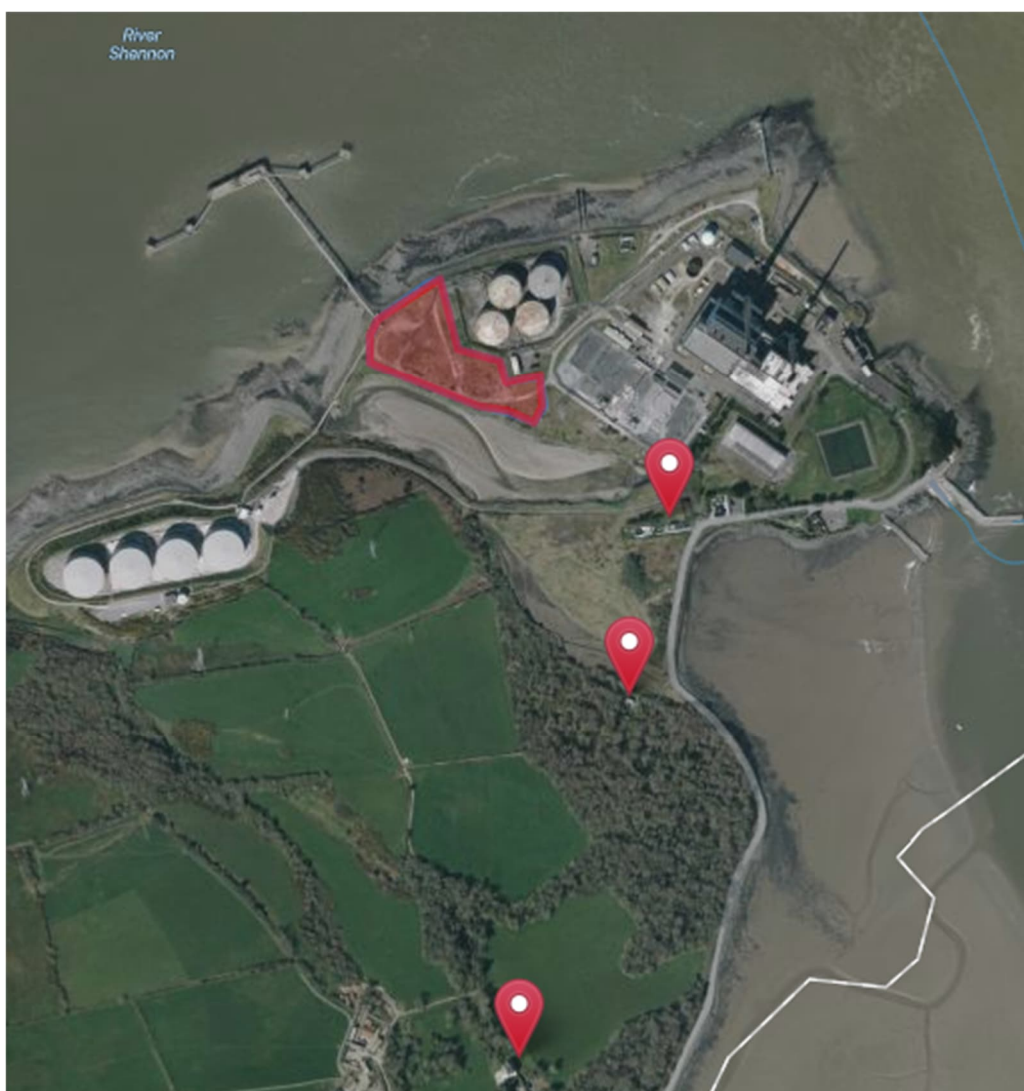
##### 4.3.4.1 Existing Receptors

The approximate distance of the closest approach to the redline boundary from the closest NSR have been provided in Table 4.29. The locations of these receptors are also shown in Plate 4.7.

**Table 4-29: Definition of Receptor Locations and Assessment Height**

Receptor	Height	Coordinates		Distance to Red Line Boundary (m)
	(m)	X (m)	Y (m)	
NSR 1	4	507412	649259	250
NSR 2	4	507403	649015	484
NSR 3	4	507235	648493	974

<sup>36</sup> Department of Transport Welsh Office (1988).



**Plate 4.7: Nearby Sensitive Receptor locations**

#### 4.3.4.2 Baseline Measurements

Baseline sound measurement data has been collected previously by a third party (Axis Environmental Services) at three locations as part of historic reports, one of which is approximately 60m east of NSR 1 and is therefore close enough to be considered representative of NSR 1. The data has been collected and submitted to EPA as part of the annual compliance measurements<sup>37</sup> and the information is summarised in Table 4.30 for the location representative of NSR 1, the nearest human receptor. Note for Day and Night periods the arithmetic average of measurements is presented.

**Table 4-30 NSR 1: Short-term Measured Baseline Sound Levels**

Consultancy	Date	Period	Measurements	L <sub>Aeq,T</sub> (dB)	L <sub>AFmax</sub> (dB)	L <sub>A90</sub> (dB)
	24-05-2021	Day	3 x 30 min (consecutive)	49	69	40

<sup>37</sup> SSE Generation Ireland Ltd. Tarbert Generating Station, Tarbert, Co.Kerry, Annual Environmental Noise Report Noise Survey 2021 Licence Number: P0607-02, Version 1, 16-07-2021

SSE Generation Ireland Ltd. Tarbert Generating Station, Tarbert, Co.Kerry Annual Environmental Noise Report Noise Survey 2021 Licence Number: P0607-02, Version 1, 28-07-2022

Consultancy	Date	Period	Measurements	L <sub>Aeq,T</sub> (dB)	L <sub>AFmax</sub> (dB)	L <sub>A90</sub> (dB)	
Axis Services	Env.	Evening	1 x 30 min	50	71	46	
		Night	2 x 30 min	51	68	44	
Axis Services	Env.	28-04-2022	Day	3 x 30 min (consecutive)	58	78	40
		Evening	1 x 30 min	46	72	38	
		Night	2 x 30 min	43	53	36	

Subjective observations of sound sources

**Table 4-31: Previous Survey Observations and Sound Sources near NSR 1**

	2021	2022
Day	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, <2 meters away from the noise meter. Operational noise from SSE Generation Ireland Ltd was audible as a continuous hum from unit 3. 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	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	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.

As the SSE operations are continuous in nature the report from both years attributes the L<sub>A90,T</sub>, a statistical level representing the quietest 10% of the measured duration, to the existing SSE operations and effectively demonstrates that the site complies with the permit conditions. The L<sub>A90,T</sub> in 2021 is 8dB higher than that observed in 2022 in the night-time, however the surveyors noted that the wind direction differed to that in 2021, there was an audible hum from overhead lines and a sound of lightly crashing waves present which could explain the observed difference.

#### 4.3.5 Likely Main Effects on Environment

Noise emissions from the Designated Development will occur in three distinct phases: construction operation and decommissioning.

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 top of a 30m tall chimney stack. Sound emissions are not expected to exceed current ambient sound levels or present distinctive characteristics such as tonality or impulsiveness. Emissions during the operational phase will be subject to fixed permitted limits, which are more stringent during the night-time.

As outlined in Section 3 (Description of the Designated Development), in the event of decommissioning, measures would be undertaken by the Applicant to ensure that there would be no significant, negative environmental effects. 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.

### Do Nothing Scenario

If the Designated Development were to not go ahead, the temporary and long-term noise sources would not be introduced into the area and the prevailing acoustic environment would continue.

#### 4.3.5.1 Construction Phase: Site Operations

By comparison of the measured baseline sound levels presented in Table 4.30, the construction noise threshold at NSR in the vicinity of the Designated Development would be 'Category A' with regards to the BS 5228 ABC criteria presented in Table 4.24.

A construction contractor has not yet been appointed, however the construction working hours are understood to be potentially required over 24/7 period to facilitate meeting project completion deadlines. Therefore, daytime, evening, weekend, and night-time noise limits apply.

The applicable construction noise criteria is derived from BS 5228 Category A as it is more stringent than those presented in the NRA Guidelines. The construction assessment criteria applied in this assessment are presented in Table 4.32. The criteria apply at one metre from the façade of sensitive receptor positions.

**Table 4-32: Relevant Construction Noise Criteria**

Period	Time	BS 5228 Criteria Category A
Night-time	23:00 - 07:00	45
Evenings and weekends	19:00 – 23:00 Weekdays 13:00 – 23:00 Saturdays 07:00 – 23:00 Sundays.	55
Daytime	07:00 - 19:00 Weekdays 07:00 -13:00 Saturdays	65

The construction phase of the Designated Development is expected to be nine months commencing in March 2023.

An indicative list of mechanical plant operating on-site during these periods have been provided by the Project Team and will be reviewed by the appointed Contractor and updated if necessary.

### Construction Noise Sources

Sound power levels for each plant item present have subsequently been assigned from archive data presented in BS 5228. The plant and associated sound power levels ( $L_{WA}$ ) for main construction are presented in Table 4.33, Table 4.34, and Table 4.35. This assessment has assumed that:

- all items of construction plant will be required in the Daytime as they are defined in Table 4.32; and
- all items of construction plant, with the exception of piling, will be required in the Evening and Weekends and Night-time periods as they are defined Table 4.32.

The assumptions are taken as a conservative approach in the absence of an appointed Contractor.

Table 4.33 lists the sound power levels of individual construction plant item that have been used in the assessment.

Table 4.34 provides details of the quantity of each item, their estimated percentage on-time and the resulting correct sound power levels associated with each type of plant item.

Table 4.35 presents the total sound power level and spectrum of all construction equipment combined used in this assessment to predict noise levels at receptors.

**Table 4-33: Plant and Associated Sound Power Levels - Main Construction**

Construction Stage	Construction Activity	Plant	Sound Power Level (dBA)	BS 5228 Table No	% On Time
Pre-construction	Clearing Site	Tracked excavator 22 t	106	C.2.3	50
	Distribution of Materials	Articulated dump truck 25 t	109	C.4.1	50
	Distribution of Materials	Articulated dump truck 25 t	109	C.4.1	50
	Breaking up concrete	Hand-held hydraulic breaker 20 kg	121	C.1.7	25
Ground Works	Ground Excavation/ Earth Works	Tracked excavator 22 t	99	C.2.21	25
	Distribution of Materials	Articulated dump truck 25 t	109	C.4.1	75
	Compacting Fill	Tracked Loaders	104	D.3.16	25
Piling	Shallow Piling, Top Feed Vibrator	Minicat Topfeed Electric Vibrator	123	C.12.59	25
	Shallow piling	360 Tracked excavator 22 t Excavator	99	C.2.21	25
Piling (Option B)	Impact Piling	Impact piling rig	134 $L_{Amax}$	AECOM Library	25
Construction	Ground Excavations/ Earthworks	Tracked excavator 22 t	99	C.2.21	50
	Distribution of materials	Articulated dump truck 25 t	109	C.4.1	50
	Mixing Concrete	Concrete mixer truck	108	C.4.20	25
	Pumping Concrete	Truck mounted concrete pump + boom arm 26t	108	C.4.29	25
	Concreting Other	Pump boom + vibrating poker	99	C.4.36	25

Construction Stage	Construction Activity	Plant	Sound Power Level (dBA)	BS 5228 Table No	% On Time
	Lifting, Telescopic Crane	Mobile Mobile telescopic crane 80t	105	C.4.39	50
	Lifting Lift	Diesel Scissor Diesel scissor lift 6t	106	C.4.59	50
	trenching	Tracked excavator 21t	99	C.4.65	25
	Power for Site Cabins	Diesel generator	94	C.4.78	100
	Pumping Water	Water pump (diesel) 100 kg	96	C.4.88	75

**Table 4-34: Plant Sound Power Levels accounting for Quantity and On Time**

Construction Stage	Plant	BS5228 Reference	L <sub>w</sub> dB(A)	Quantity	% On Time	Total dB(A)	L <sub>w</sub>
Pre-construction	Tracked excavator 22 t	C.2.3	106	1	50	103	
	Articulated dump truck 25 t	C.4.1	109	1	50	106	
	Articulated dump truck 25 t	C.4.1	109	1	50	106	
	Hand-held hydraulic breaker 20 kg	C.1.7	121	1	25	115	
Ground Works	Tracked excavator 22 t	C.2.21	99	1	25	93	
	Articulated dump truck 25 t	C.4.1	109	1	75	108	
	Tracked Loaders	D.3.16	104	1	25	98	
Piling (Option A)	Minicat Topfeed Electric Vibrator	C.12.59	123	1	25	117	
	Tracked excavator 22 t	C.2.21	99	1	25	93	
Piling (Option B)	Impact piling rig	AECOM Library	134 L <sub>Amax</sub>	1	25	128	
Construction	Tracked excavator 22 t	C.2.21	99	1	50	96	
	Articulated dump truck 25 t	C.4.1	109	1	50	106	
	Concrete mixer truck	C.4.20	108	1	25	102	
	Truck mounted concrete pump + boom arm 26t	C.4.29	108	1	25	102	
	Pump boom + vibrating poker	C.4.36	99	1	25	93	
	Mobile telescopic crane 80t	C.4.39	105	1	50	102	
	Diesel scissor lift 6t	C.4.59	106	1	50	103	



Construction Stage	Plant	BS5228 Reference	L <sub>w</sub> dB(A)	Quantity	% On Time	Total dB(A)	L <sub>w</sub>
	Tracked excavator 21t	C.4.65	99	1	25	93	
	Diesel generator	C.4.78	94	1	100	94	
	Water pump (diesel) 100 kg	C.4.88	96	1	75	95	

**Table 4-35: Assumed Sound Power Level for All Construction Activities Combined**

	Octave Band Sound Power Levels (dB)								L <sub>w</sub> dB(A)
	63	125	250	500	1k	2k	4k	8k	
Pre-construction	89.3	97.5	101.5	107.0	110.4	109.6	106.3	107.8	115.7
Ground Works	91.0	98.2	96.0	103.1	102.3	101.5	95.3	89.1	108.3
Piling Option, A (Vib)	94.5	105.5	109.1	110.6	111.1	110.3	104.3	93.9	117.0
Piling Option B (Impact)	-	-	-	-	-	-	-	-	128
Construction	91.6	98.1	99.4	104.2	105.0	105.9	97.6	91.6	110.8

### Noise Modelling Setup

Construction noise level predictions for each construction phase, including the vibratory and impact piling options, A & B respectively, have been undertaken to provide a robust assessment of the common piling techniques and their potential impact and offer an indication of the subsequent scale of mitigation required to meet the assessment criteria in the relevant assessment period.

Specialist environmental noise level modelling software CadnaA was used to predict construction noise levels at receptors.

Prediction for Pre-Construction, Ground Works and Construction phases were represented in the model by an area source with an extent equal to the area within the red line boundary attributed to the proposed generators and ancillary equipment. The broadband sound power level (L<sub>wA</sub>) was assigned to the area sources and therefore the total sound energy was distributed evenly over this area.

For the piling phase predictions, the activities were represented by a single point source 4m above ground and approximately at 250m from the nearest receptor, NSR 1. This piling position was selected as it represents the closest position at which piling activity would be undertaken with respect to the closest (human) sensitive receptor. This was selected on the basis that piling will only be required where building/structures are located. The position is representative of the east-most location of the plant area.

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 a representative HGV spectrum and a maximum pass-by sound power level taken from BS 5228 reference C.2.34. An on-time correction was applied to account for the non-continuous nature of these vehicle movements based on the peak number of HGV expected. 186 per day two way flow.

The contribution of the area source and line source was then used to determine a combined sound pressure level at the sensitive receptors. The following assumptions and CadnaA settings were used:

- All land is assumed to be flat; ground topography information was not available for this assessment.
- Ground absorption = 1.0 (Soft) – for grass areas to south of power station;
- Ground absorption = 0.0 (Hard) – for all other areas, including water; and
- Reflection order = 3.
- Sound level calculation have been undertaken in accordance with ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation.

We have also included a 4m high acoustic barrier along the southern and western boundaries of the Site to align with the mitigation detailed within the ecological reports (AA and NIS, AECOM 2023).

#### 4.3.5.2 Likely Main Construction Phase Noise Levels

The total predicted noise levels have been calculated at NSRs accounting for the combined contribution from the two items listed below (Item A and Item B):

- construction site activities, as defined by Table 4.35, being undertaken in the main construction area; and from
- the movement of HGV within the Site between the public access road and the main construction area – the shortest internal haul route using the southern entrance to the Site from the N67 .

The predicted construction site activity noise levels for each receptor are presented in Table 4.36 (Item A above).

**Table 4-36: Predicted Construction Site Noise Level at Receptors for each Construction Stage**

Receptor	Approximate Distance to Red Line Boundary (m)	Predicted Pre-Construction Noise Level $L_{Aeq,T}$ dB	Predicted Groundworks Noise Level $L_{Aeq,T}$ dB	Predicted Piling Option A Noise Level $L_{Aeq,T}$ dB	Predicted Piling Option B Noise Level $L_{Aeq,T}$ dB	Predicted Construction Noise Level $L_{Aeq,T}$ dB
NSR 1	250	44.7	38.7	53.0	64.6	40.9
NSR 2	484	40.6	34.9	46.4	58.3	37.0
NSR 3	974	34.0	28.8	38.5	50.7	30.6

Relating to Item A, Table 4.36 indicates that the highest predicted construction levels are associated with Impact Piling resulting in a prediction of 64.6dB  $L_{Aeq,T}$  at NSR 1. While Vibratory Piling (Option B) is the second highest and the Pre-Construction Phase is the third highest at all three receptors.

Relating to Item B, Table 4.37 presents the predicted HGV movement levels at each NSR over each construction period. Note that for these HGV predictions only, we have taken NSR 1 to be located at the property furthest east, which is closest to the site access road, to present a more robust assessment. The number of each HGV in each period has been determined based on the average number of HGV in a 1 hour period, when all HGV movements (186 two-way) are spread over a 24 hour period,  $186/24 = 7.75$  HGV per hr, therefore 93 HGV movements over 12 hours (Daytime) etc. For context, doubling the number of HGV occurring in a period will increase the predicted level by 3dB assuming speeds

remain the same. This means that periods that are lower than the limit by 3dB or more could potentially accommodate higher rates of HGV per hour.

**Table 4-37: Predicted levels at Receptors for HGV movement within the site.**

Receptor	Daytime	Saturday AM	Evenings	Saturday PM	Sunday	Night
	L <sub>Aeq,12hr</sub> dB	L <sub>Aeq,6hr</sub> dB	L <sub>Aeq,4hr</sub> dB	L <sub>Aeq,10hr</sub> dB	L <sub>Aeq,16hr</sub> dB	L <sub>Aeq,8hr</sub> dB
	Limit: 65 dB			Limit: 55 dB		Limit: 45 dB
NSR 1	49.9	49.9	49.9	49.9	49.9	49.9
NSR 2	29.8	29.8	29.8	29.8	29.8	29.8
NSR 3	16.9	16.9	16.9	16.9	16.9	16.9

It can be seen that there is an exceedance of the night-time criteria at NSR 1 from HGV movements assumed to be passing at a rate of eight HGV per hour. This is discussed further after the contribution of the construction site activities have been added.

The results from Item A and B, given in Table 4.37 and Table 4.38 respectively are summed and presented in the following tables. Tables 4.38 to Table 4.42 present the final total predicted construction phase noise levels for each construction stage. Exceedances are highlighted in bold font. Note that piling in the evening, weekend and night-time will not occur and are therefore not considered in those periods.

**Table 4-38: Total Predicted Pre-Construction and HGV Levels at Receptors**

Receptor	Daytime	Saturday AM	Evenings	Saturday PM	Sunday	Night
	L <sub>Aeq,12hr</sub> dB	L <sub>Aeq,6hr</sub> dB	L <sub>Aeq,4hr</sub> dB	L <sub>Aeq,10hr</sub> dB	L <sub>Aeq,16hr</sub> dB	L <sub>Aeq,8hr</sub> dB
	Limit: 65 dB			Limit: 55 dB		Limit: 45 dB
NSR 1	51	51	51	50	51	<b>51</b>
NSR 2	41	41	41	41	41	41
NSR 3	34	34	34	34	34	34

**Table 4-39: Total Predicted Groundworks and HGV Levels at Receptors**

Receptor	Daytime	Saturday AM	Evenings	Saturday PM	Sunday	Night
	L <sub>Aeq,12hr</sub> dB	L <sub>Aeq,6hr</sub> dB	L <sub>Aeq,4hr</sub> dB	L <sub>Aeq,10hr</sub> dB	L <sub>Aeq,16hr</sub> dB	L <sub>Aeq,8hr</sub> dB
	Limit: 65 dB			Limit: 55 dB		Limit: 45 dB
NSR 1	50	50	50	48	50	<b>50</b>
NSR 2	36	36	36	36	36	36
NSR 3	29	29	29	29	29	29

**Table 4-40: Total Predicted Construction and HGV Levels at Receptors**

Receptor	Daytime L <sub>Aeq,12hr</sub> dB	Saturday AM L <sub>Aeq,6hr</sub> dB	Evenings L <sub>Aeq,4hr</sub> dB	Saturday PM L <sub>Aeq,10hr</sub> dB	Sunday L <sub>Aeq,16hr</sub> dB	Night L <sub>Aeq,8hr</sub> dB
	Limit: 65 dB			Limit: 55 dB		Limit: 45 dB
NSR 1	50	50	50	49	50	50
NSR 2	38	38	38	37	38	38
NSR 3	31	31	31	31	31	31

**Table 4-41: Total Predicted Piling Option A and HGV Levels at Receptors (Vibratory Piling)**

Receptor	Daytime L <sub>Aeq,12hr</sub> dB	Saturday AM L <sub>Aeq,6hr</sub> dB	Evenings L <sub>Aeq,4hr</sub> dB	Saturday PM L <sub>Aeq,10hr</sub> dB	Sunday L <sub>Aeq,16hr</sub> dB	Night L <sub>Aeq,8hr</sub> dB
	Limit: 65 dB			Limit: 55 dB		Limit: 45 dB
NSR 1	55	55	NA	NA	NA	NA
NSR 2	46	46	NA	NA	NA	NA
NSR 3	39	39	NA	NA	NA	NA

**Table 4-42: Total Predicted Piling Option B and HGV Levels at Receptors (Impact Piling)**

Receptor	Daytime L <sub>Aeq,12hr</sub> dB	Saturday AM L <sub>Aeq,6hr</sub> dB	Evenings L <sub>Aeq,4hr</sub> dB	Saturday PM L <sub>Aeq,10hr</sub> dB	Sunday L <sub>Aeq,16hr</sub> dB	Night L <sub>Aeq,8hr</sub> dB
	Limit: 65 dB			Limit: 55 dB		Limit: 45 dB
NSR 1	65	65	NA	NA	NA	NA
NSR 2	58	58	NA	NA	NA	NA
NSR 3	51	51	NA	NA	NA	NA

Table 4.38, Table 4.39, and Table 4.40 identifies an exceedance of the night-time criterion at NSR 1 due to HGV movements when passing the property at the assumed rate of eight HGV per hour. This indicates that night-time HGV movements in such numbers could cause significant adverse noise impacts at this receptor. It is predicted that reducing the number of movements at night to two per hour would reduce noise levels from HGV pass-bys to within the criterion, however, where possible, night-time HGV movements should be avoided along the internal haul route assessed to minimise adverse impacts at the receptors during the works. Utilising the eastern entrance which is an alternative internal haul route that does not pass NSR 1 would also make the contribution of the haul route negligible on total levels.

The predicted levels in each construction stage at each receptor were compared against the BS 5228 Category A criteria and assuming night-time HGV is limited to two HGV per hour in the night-time rather than eight. Table 4.37 indicates if the BS 5228 Category A and NRA Guideline limits are met at NSR 1 after predicted levels are rounded to the nearest whole decibel. Note that piling in the evening, weekend and night-time will not occur and are therefore not considered in those periods.

**Table 4-43: Compliance of Construction Activities at Nearest Noise Sensitive Receptor NSR 1.**

	Daytime		Evening and Weekend		Night-time	
	Below BS 5228 Cat A Limit?	Below NRA Guidelines?	Below BS 5228 Cat A Limit?	Below NRA Guidelines?	Below BS 5228 Cat A Limit?	Below NRA Guidelines?
Reference Value	65 dB LAeq,T	70 dB LAeq,T	55 dB LAeq,T	60-65 dB LAeq,T	45 dB LAeq,T	NA
<b>Stage</b>						
Pre-construction	Yes	Yes	Yes	Yes	Yes	-
Ground Works	Yes	Yes	Yes	Yes	Yes	-
Vibratory Piling (Option A)	Yes	Yes	NA	NA	NA	-
Impact Piling (Option B)	Yes	Yes	NA	NA	NA	-
Construction	Yes	Yes	Yes	Yes	Yes	-

BS 5228 Daytime: 0700 to 1900 hours

BS 5228 Evenings and Weekends: 1900 – 2300 Weekday Evenings 13:00 – 23:00 Saturdays 07:00 – 23:00 Sundays.

BS 5228 Night-time: 2300 to 0700 hours

Table 4.43 relates to NSR 1 the nearest noise sensitive receptor only, however in this context, it follows if predicted levels are compliant with limits at the nearest sensitive receptor then it also indicates that compliance at more distant receptors is achieved. This is due to the natural reduction of the construction noise levels over the additional distance travelled.

On this basis no significant adverse effects are expected at residential NSR positions with regards construction phase noise levels generated by on-site activities. In accordance with Table 4.21 and Table 4.22 the impacts are defined as not significant, short-term, and reversible.

#### 4.3.5.3 Construction Phase: Traffic on Existing Roads

Construction vehicles will approach Tarbert Power Station via N69 and N67. Predicted traffic flows on the surrounding road network are available for the N69 only.

#### Construction Traffic using N69

Preliminary construction traffic data available for the N69 has been used to undertake a preliminary assessment of traffic noise.

Based upon current two-way flows on N69 for sample period 5th - 11th January 2023 (weekdays only), baseline flows were recorded as 2712 18hr AAWT, of which 164 (6%) were HGVs.

Construction traffic associated with the project is expected to total 286 two-way movements per day, of which 186 (65%) will be HGV movements per day. This equates to a 11% increase in total flows per day on N69 over the predicted future baseline, although the overall the percentage of HGVs is forecast to increase by a factor of two (12% HGV) compared with baseline flows.

For context, an increase in traffic flows of 25% would result in a 1dB(A) increase in road traffic noise and a 100% increase would result in a 3dB(A) increase, assuming average speeds and the percentage of HGVs remains unchanged. Therefore, on the basis that average traffic speed on N69 remains unchanged during construction, the predicted change in road traffic noise levels at the front façade of properties on N69 resulting from a 11% increase in total flow, together with an increase percentage HGV component, would be <1.5dB(A).

## Construction Traffic using N67

The N67 is a public road that terminates at the Tarbert Power Station although baseline traffic count data are not available. The Shannon Ferry terminus is adjacent to Tarbert Power Station and is also accessed via the N67. The ferry terminal can service only a finite number of vehicles each day. Information of the capacity of the two ferries and the timetables were available online at the time of submission and have been used to approximate baseline traffic flows on the N67.

The maximum 18hr AAWT baseline two-way flows on the N67 are estimated from the Shannon Ferry timetable as:

- Off Peak (Jan-May, Oct-Dec)
  - Mon – Sat: 1560 18hr AAWT;
  - Sunday: 1320 18hr AAWT;
- Peak (Jan-May, Oct-Dec)
  - Mon – Sat: 2840 18hr AAWT;
  - Sunday: 2600 18hr AAWT;

In the absence of baseline information regarding the percentage of HGVs, it is considered reasonable to adopt the 6% HGV present on the N69.

The maximum 18hr AAWT baseline two-way flows plus the maximum additional two-way construction vehicles (286) on the N67 associated with the Designated Development, results in increases to the percentage of HGV and the overall changes listed:

- Off Peak (Jan-May, Oct-Dec)
  - Mon – Sat: 15% HGV | 3dB change;
  - Sunday: 17% HGV | 3dB change;
- Peak (Jan-May, Oct-Dec)
  - Mon – Sat: 11% HGV | 2dB change;
  - Sunday: 12% HGV | 2dB change;

Note that reducing the 6% HGV assumption would increase the overall change whereas as increasing the 6% HGV would decrease the overall change.

These magnitudes of noise change would be considered a **negligible impact (not significant)**. In accordance with Table 4.21 and Table 4.22 these increases would be defined as **imperceptible, short-term but reversible**.

It is important to note that as the majority of road traffic vehicles using the N67 are associated with the ferry crossing, that night-time traffic flows are likely to be limited to the those of residents and power station access only. This means that in order to avoid adverse impacts at night-time regular HGV movements occurring outside of the ferry operating times should be avoided.

### 4.3.5.4 Operational Phase: Site Operations Criteria

The location of the Designated Development does not meet the definition of a 'Quiet Area'. The assessment therefore evaluates potential adverse impact from noise emissions using criteria derived from existing baseline sound levels ( $L_{A90,T}$ ) around the Site.

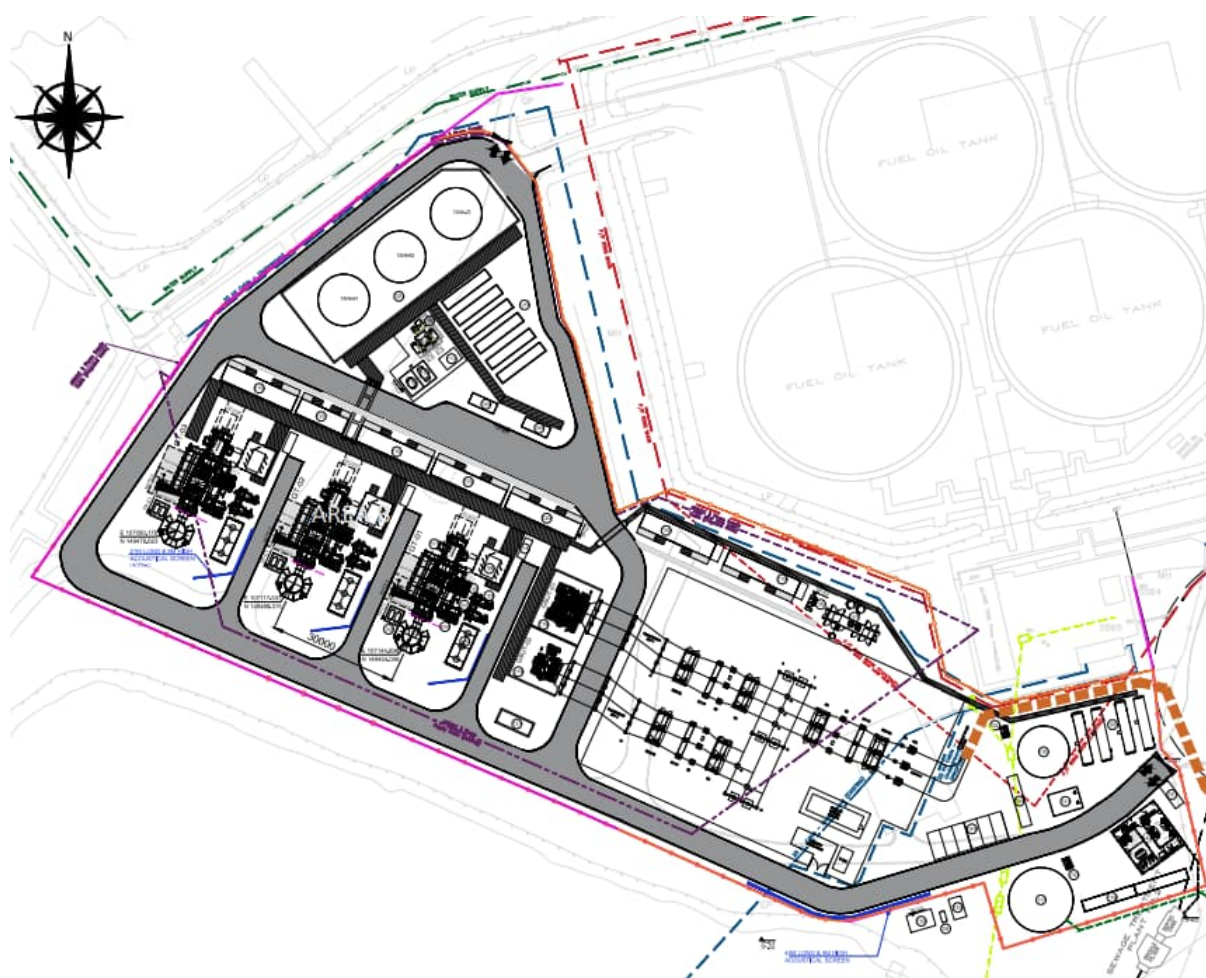
Analysis of the measured baseline levels presented in Table 4.30 and Table 4.31 indicate that the *background sound levels* can be classed as 'All other Areas' as, for example, all night-time  $L_{A90,T}$  values summarised in Table 4.30, are above 30dB(A) suggesting that the Site cannot be classed as a 'Low Background Noise Area'. This is also consistent with the EPA license conditions referenced in the site's annual compliance reports.

Therefore, to assess the impact of the Designated Development with regard to operational noise, the 'All other Areas' criteria have been adopted from Table 4.28. It is understood that operations are of a 24/7 nature *i.e.*, the assessment is based on the Temporary Emergency Plant operating at any time throughout the day, evening, or night. Therefore, the noise criterion of 45dB  $L_{Aeq,T}$  for the night-time at the nearest NSR location has been adopted. Compliance with this night-time criterion will therefore ensure compliance with the higher criteria for daytime and evening periods.

### **Temporary Emergency Generator Plant Proposed construction**

The Designated Development will be limited to operating 500 hours a year. The precise size, configuration, performance, and layout of the equipment will be finalised at a later detailed design stage in conjunction with the appointed equipment supplier. However, this will not adversely affect the design of the buildings or emissions as described in this report. An indicative layout for the plant area is provided in Plate 4.8 from drawing reference TAR/00/E/001b--003/GA/202 dated 24<sup>th</sup> January 2023.

It worth noting here that the operational equipment designer/supplier has been appointed and is General Electric (GE). GE have defined the plant list separate to this report along with predicted operational sound levels.



**Plate 4.8: Indicative Preliminary Plant Area Layout including the Location of Acoustic Screens (Blue) [from drawing reference TAR/00/E/001b---003/GA/202 dated 24<sup>th</sup> January 2023]**

#### 4.3.5.5 Assessment

To determine the potential noise impact of the Designated Development on the NSR locations identified, all significant operational noise sources have been included in a 3D noise model. Operational noise modelling has been undertaken by GE.

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. Therefore, no corrections have been applied.

The 3D noise model has been used to calculate operational phase noise levels at the NSR locations identified in an iterative approach where the site layout, operational plant items and any noise reducing interventions have been considered as a whole in order to meet the *NG4* assessment criteria in the night-time 45dB  $L_{Aeq,T}$  at NSR 1. Acoustic screen/barrier mitigation has been incorporated as part of the operational design (see Plate 4.8) which are:

- Three 8m high and 21m long barriers around the south-east corner of each of the three emergency generator units.
- A 5m high and 45m long barrier on the south of the plant area at the south-east corner of the new substation shown in Plate 4.8.



Therefore, compliance at NSR 1, which is the nearest sensitive receptor, is predicted on this basis and therefore compliance at the more distant receptors NSR 2 and NSR 3 is also predicted, because operations will generally be quieter at more distant locations.

It is worth noting some additional contextual factors which are:

- The previously surveyed ambient sound levels  $L_{Aeq,T}$  during the night-time (refer to Table 4.33) have been observed to be comparable with 45dB  $L_{Aeq,T}$  limit at NSR 1 already. This further suggests that the Designated Development is unlikely to be prominently audible at this location in relation to existing noise sources in the area.
- *BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings* defines acceptable internal levels within bedrooms as being 30dB  $L_{Aeq,T}$  during the night-time. It also states that a façade with an open window will provide approximately 15dB of sound attenuation.
- With windows shut it is likely that noise from the Designated Development will be inaudible within bedrooms at NSR 1. With windows open noise levels from the Designated Development are predicted to meet the BS 8233 criterion. It is noted that the BS 8233 criterion is applicable to anonymous sources only, however it is used in this context for reference.
- NG4 makes significant reference to the application of Best Available Techniques (BAT). This assessment has been undertaken iteratively to reach an operational design that would meet the more stringent NG4 night-time operational criteria, although the site will only operate for a limited number of hours (500) in a year. The noise mitigation strategy proposed by GE is considered to be an application of BAT.

Considering operational plant has been iteratively modelled to meet the numerical limits, the adoption of in-built mitigation and contextual factors, significant impacts associated with operational phase noise levels resulting are not expected at nearby NSR. In accordance with Table 4.21 and Table 4.22 the impacts are defined as **not significant, short-term but reversible**.

#### 4.3.5.6 Operational Phase: Traffic on Existing Roads

A negligible increase in traffic noise levels during operations is expected and therefore, in accordance with Table 4.21 and Table 4.44 the impacts are defined as **not significant, short-term but reversible**.

#### 4.3.6 Construction Phase – Mitigation Measures

A commitment is made to adopt the construction noise limits detailed in this assessment with reference to Table 4-32. . The assessment of construction noise detailed above indicated that no significant adverse effects on the environment would be caused as a result of the construction activities.

Nonetheless, to ensure noise levels are kept to a minimum and to reduce the risk of cumulative effects, it is recommended that the following measures are adopted during the construction phase, as a minimum:

- Good community relations to 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 ancillary plant such as generators, compressors, and pumps to be located away from sensitive receptors wherever possible.
- All plant used onsite to be regularly maintained, paying attention to the integrity of silencers and acoustic enclosures.
- All noise generating construction plant to be shut down when not in use.
- The loading and unloading of materials to take place away from residential properties, ideally in locations which are acoustically screened.
- Materials to be handled with care and placed rather than dropped where possible. Drop heights of materials from lorries and other plant shall be kept to a minimum.
- Modern plant to be selected which complies with the latest European Commission noise emission requirements<sup>38</sup>. Electrical plant items (as opposed to diesel powered plant items) to be used wherever practicable. All major compressors to be low noise models fitted with properly lined and sealed acoustic covers. All ancillary pneumatic percussive tools to be fitted with mufflers or silencers of the type recommended by the manufacturers.
- Site operations and vehicle routes to 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 and persons employed on the site to 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 to include information on minimising noise and reminding them to be considerate of the nearby residents.
- As far as practicable, noisier activities to be planned to take place during periods of the day which are generally considered to be less noise sensitive *i.e.*, not particularly early, or late in the day.
- Measures to be put in place to ensure that employees know that minimisation of noise will be important at the site; and
- It will be ensured that construction traffic from this and other concurrent developments 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.

#### **4.3.7 Operational Phase – Mitigation Measures**

A commitment is made to adopt the operational noise limits detailed in this assessment as requirements of the final design, including the need to address distinctive acoustic characteristics and / or adjust the noise limits accordingly. Mitigation measures include the following:

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<sup>38</sup> [Noise emission by outdoor equipment \(europa.eu\)](http://europa.eu)

- Silencers;
- Attenuators;
- Specification of low noise plant wherever possible; and
- Inclusion of acoustic barriers where required to reduce noise levels at receptors from operational equipment as listed in 4.3.5.5.

Further assessment will be undertaken at the detailed design stage to confirm compliance with the 45dB  $L_{Aeq,T}$  criterion. Furthermore, compliance with the nominated criteria will be confirmed via long-term noise monitoring.

The Designated 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 existing SSE Tarbert IE Licence will be amended to include the Designated Development, or a new licence application will be submitted. The terms and conditions of which are anticipated to require a noise monitoring protocol to be adopted.

#### 4.3.8 Residual Effects

No significant residual impacts are expected.

#### 4.3.9 Cumulative Impacts

The following developments have been considered as part of the cumulative assessment:

- Temporary Emergency Generator Power Plant at West Offaly Power Station – Located ~75 miles in West Offaly; and
- SSE Tarbert Power Station – Located adjacent to the Designated Development;

##### Temporary Emergency Generator Power Plant at West Offaly Power

As the West Offaly Station development being undertaken in parallel to this is located ~75 miles away there is **No significant cumulative impacts** are expected to arise from the Designated Development related to noise.

##### SSE Tarbert Power Station

**No significant cumulative impacts** are expected to arise from the Designated Development relating to noise, either during the construction or operational phases (with operational mitigation in place), for the following reasons:

- The operational level of the existing SSE Tarbert Power Station is predicted from sound level measurement undertaken at NSR 1 as part of the annual compliance monitoring and reporting. The report determined that the noise associated with the site during the 2022 survey was 40, 38 and 36dB based on the  $L_{A90,T}$  measured in the day, evening, and night-time periods respectively. This determination was made under the weather conditions occurring at the time, on the assumption that the SSE site produces a continuous noise and would therefore be most closely represented by the  $L_{A90,T}$  value. These values are therefore likely an over estimation as other sound sources in the area may have continued even in the quietest 10% of the measurement duration.

- Therefore, on the basis that the exiting power station and Designated Development combined would likely be expected to meet the existing 45dB  $L_{Aeq,T}$  permit condition in the night-time at NSR 1. This would suggest the Designated Development could not exceed the 44dB  $L_{Aeq,T}$  at NSR 1 without risking exceeding the 45dB  $L_{Aeq,T}$  permit condition.
- This consideration was fed into the iterative design process discussed in the operational assessment section.
- Following further assessment (once the principal contractor is appointed) and, where necessary, following appropriate mitigation, construction noise levels are not predicted to exceed the defined limits that the contractor must comply with (in Table 4.32) and therefore no significant adverse residual impacts from construction noise have been predicted at NSR within the vicinity of the Designated Development; and
- The Designated Development is not expected to generate significant traffic during its operational phase.

#### 4.3.10 Summary

The Designated Development has been assessed with regard to the following areas:

- Short-term impacts during the construction 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 Designated Development once complete; and
  - Noise generated by changes to traffic flows on existing roads.

Subject to the adoption of the mitigation measures detailed in this section, all effects are defined in accordance with Table 4.21 and Table 4.22 as either imperceptible or not significant. Construction effects are defined as temporary/short-term, whilst operational effects are short-term, and all are reversible.

## 4.4 Biodiversity

### 4.4.1 Introduction

This section prescribes the mitigation measures necessary for the Contractor to implement in order to prevent or reduce adverse effects upon ecological features. It also takes into account the legal requirements associated with statutory protected sites and species and describes mitigation measures which will be implemented.

Effects upon ecological features arising from the process of decommissioning of the Designated Development are of a similar or lesser nature and duration to those arising from the construction process and therefore have not been considered separately in this document. Where this assessment

refers to potential construction effects, these are also representative of predicted decommissioning effects.

The Natura Impact Statement (NIS) (AECOM, 2023d) also provides detailed mitigation measures which the Contractor will adhere to, to ensure that there are no adverse effects on the integrity of any European sites (which comprise Special Areas of Conservation (SACs) and Special Protections Areas (SPAs)).

#### 4.4.2 Baseline

A desk-based review of available information supplemented by a site walkover and bird surveys conducted in November and December 2022 by AECOM ecologists has informed an appraisal of the ecological baseline conditions of the Designated Development Site and surrounds.

Furthermore, available sources background ecological information which has been reviewed include:

- Environmental Report Proposed Battery Storage Facility – Tarbert Power Station, Tarbert Co Kerry. Malachy Walsh and Partners, April 2018; and
- Screening for Appropriate Assessment Proposed Battery Storage Facility – Tarbert Power Station, Tarbert Co Kerry. Malachy Walsh and Partners, March 2018;
- Ecological desk study data (designated sites, protected and notable species) sources:
  - The National Biodiversity Data Centre <https://biodiversityireland.ie/> accessed 04/11/2022
  - National Parks & Wildlife Services <https://www.npws.ie/> accessed 04/11/2022
  - Google earth aerial mapping <https://earth.google.co.uk/>

##### 4.4.2.1 Statutory designations

Two internationally designated sites are located within a 2km radius of the Site. Further details of these designated sites are provided in the NIS(AECOM, 2023d) and summarised in Table 4.44. In Ireland, the habitats and / or species which are the reason(s) for designation of an SAC are referred to as ‘Qualifying Interests’ (QI). In relation to SPAs, the bird species for which a particular site is designated are referred to as the ‘Special Conservation Interests’ (SCI).

**Table 4-44: Statutory designated nature conservation sites**

Site name [site code]	Approximate distance from the Designated Development	Summary of Qualifying Interests (QI)/ Special Conservation Interests (SCI)
River Shannon and River Fergus Estuaries SPA [0004077]	Approximately 5m from the Site of the Designated Development and encompasses the River Shannon, immediately west, as well as a small creek, immediately south.	<ul style="list-style-type: none"> <li>• Non-breeding birds</li> <li>• Cormorant (breeding and wintering)</li> <li>• Wetland and waterbirds</li> </ul>
Lower River Shannon SAC [002165]	Approximately 8.5m from the Site of the Designated Development and encompasses the River Shannon and other associated nearby habitats, including an area of woodland to the south.	<ul style="list-style-type: none"> <li>• Sandbanks</li> <li>• Estuaries</li> <li>• Mudflats and sandflats</li> <li>• Coastal lagoons</li> <li>• Reefs</li> <li>• Vegetated sea cliffs</li> <li>• Atlantic sea-meadow</li> <li>• Mediterranean salt meadows</li> </ul>

Site name [site code]	Approximate distance from the Designated Development	Summary of Qualifying Interests (QI)/ Special Interests (SCI) Conservation
		<ul style="list-style-type: none"> <li>• Watercourses of plain to montane levels</li> <li>• <i>Molinia</i> meadows on calcareous, peaty, or clayey-silt-laden soils [6410]</li> <li>• Alluvial forests with alder <i>Alnus glutinosa</i> and ash <i>Fraxinus excelsior</i></li> <li>• Freshwater pearl mussel <i>Margaritifera margaritifera</i></li> <li>• Sea lamprey <i>Petromyzon marinus</i></li> <li>• Brook lamprey <i>Lampetra planeri</i></li> <li>• River lamprey <i>Lampetra fluviatilis</i></li> <li>• Atlantic salmon <i>Salmo salar</i></li> <li>• Common bottlenose dolphin <i>Tursiops truncatus</i></li> <li>• Otter <i>Lutra lutra</i></li> </ul>

#### 4.4.2.2 Non-statutory designations

There is one non-statutory designation for nature conservation within 2km of the Designated Development. This is shown in Table 4.45. In addition to this, there is an area of long established woodland in Tarbert approximately 426m south of the Designated Development. There are no National Parks and Wildlife Services (NPWS) listed Nature Reserves, Ancient Woodlands, or wildfowl sanctuaries within 2km of the Site.

**Table 4-45 : Non-statutory designated nature conservation sites**

Site name [site code]	Approximate distance from the Designated Development	Site type	Summary of Qualifying Interests
Tarbert Bay [001386]	160m south	Proposed NHA	Not defined. Forms part of the wider River Shannon and River Fergus Estuaries SPA.

#### 4.4.2.3 Protected and notable species

The National Biodiversity Data Centre (NBDC) and NPWS database search (excluding records more than 50 years old) returned a number of protected and notable species records located within 2km of the Site. Records for the Site itself will be subject to the lack of general accessibility for recording. In summary records of the following species were identified:

- Badger *Meles meles*;
- Irish hare *Lepus timidus hibernicus*; and
- Birds - 19 protected and rare bird species were returned by the NPWS and NBDC database search within 2km of the Site.

It cannot be confirmed from the data provided if these birds were recorded within the Site itself, or in the more extensive area outside the Site. Nor can it be confirmed in many cases that they were breeding, since the records mostly do not state whether nests or territorial behaviour were observed.

Several of the bird species returned by the NPWS and NBDC database search are listed under Annex I of the Birds Directive. These comprise:

- Kingfisher *Alcedo althis*;
- potentially breeding little egret *Egretta garzetta*;
- peregrine falcon *Falco peregrinus*; and
- wintering great northern diver *Gavia immer*.
- Further details of records of Species of Conservation Interest (SCI) of the River Shannon and River Fergus Estuaries SPA are provided in Section 3.2 of the NIS (AECOM, 2022d).

#### 4.4.2.4 Invasive non-native species flora

Three records of invasive non-native species returned by the NBDC and NPWS database search; rhododendron *Rhododendron ponticum*, Spanish bluebell *Hyacinthoides hispanica*, and sycamore *Acer pseudoplatanus* from the study area.

During the field survey, no Scheduled invasive plant species<sup>39</sup> were recorded within the Designated Development Site. However, winter heliotrope *Petasites fragrans* (a 'low impact' non-native species, according to the National Biodiversity Data Centre (NBDC)) and butterfly-bush *Buddleja davidii* (a 'medium impact' non-native species according to NBDC) were recorded (see Figure 5 of the NIS (AECOM, 2023)).

A large area of winter heliotrope was identified to the north-west of the Site boundary, however this was not mapped as it is outside of the Designated Development boundary.

#### 4.4.2.5 Site Description Habitats

The Site comprises one area within the boundary of the existing Tarbert Power Station Site as shown on Figure 1: Site Location. The proposed location for the generators to be installed comprises an area of 2.4ha located to the eastern side of the existing Tarbert Power Station operational area and comprises sparse grassland and ephemeral /scrub habitat overlying areas of gravelled and hardstanding with limited vegetation cover. An area located directly west of the existing Tarbert Power Station building is proposed to be used as a construction compound and comprises predominantly existing hard standing. The Site is bordered to the north, west and further east by the Shannon Estuary and to the south by a tidal inlet lagoon.

Survey of the habitats within the Site was carried out in November 2022 (see Figure 5 of the NIS (AECOM, 2023)). The survey area for the Site was based on a previous iteration of the red line boundary, thus encompassed the main development area for the Designated Development. Due to the updating of the red line boundary, not all of the habitats within the Designated Development were

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<sup>39</sup> i.e., invasive non-native plant species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011.

surveyed and are thus not mapped. However, the habitats within the updated red line boundary have subsequently been determined through the use of aerial imagery and knowledge of the Site gained through the November 2022 habitat survey. The habitats within the Designated Development are those typically associated with an industrial facility i.e., recolonising bare ground (ED3), buildings and artificial surfaces (BL3), lagoons and saline lakes (CW1), amenity grassland (GA2) and scrub (WS1). The survey was carried out by AECOM Ecologists Susanne Dunne and Alison Donnelly, both of whom have more than four years' experience in conducting this type of survey across Ireland. Susanne holds a BSc (Hons) in Ecology from University College Cork and Alison holds a BSc in Marine Science from University of Galway and a MSc in Marine Biology from University College Cork.

The walkover survey involved an inspection of habitats in accordance with *A Guide to Habitats in Ireland* (Fossitt, 2000) and *Best Practice Guidance for Habitat Survey and Mapping* (Smith *et al*, 2011). The standard survey method was 'extended' to assess the suitability of the habitats present to support the QI / SCI of European sites within the potential ZOI of the Designated Development, and to search for evidence of such species.

The survey identified the following habitats as being present within the survey area (see Figure 5 of the NIS, AECOM, 2022d):

- GS2 Dry meadows and grassy verges;
- WS1 Scrub;
- ED1 Exposed sand, gravel, or till;
- ED2 Spoil and bare ground;
- ED3 Recolonising bare ground; and
- BL3 Buildings and artificial surfaces.

## Birds

Targeted surveys for non-breeding waterbirds<sup>40</sup> have been carried out within the Site of the Designated Development plus a 500m buffer (termed as the survey area) in November and December 2022, and in January 2023. All parts of the survey area containing suitable habitat for non-breeding waterbirds were visible during the surveys. A 500m buffer was used as beyond this distance, disturbance of non-breeding waterbirds from noise and/or visual stimuli is unlikely (see Section 5 of this NIS for further information relating to this). The survey adopted the method used for the Irish Wetland Bird Survey (I-WeBS), as described in the *Counter Manual* for the scheme (BirdWatch Ireland and NPWS, undated), which itself is based on the 'look-see' method described by Bibby *et al* (2000). These involved surveys conducted either side of low and high tide.

## Low Tide Survey

None of the named SCI species of River Shannon and River Fergus Estuaries SPA were recorded during the survey within the Site of the Designated Development, including the construction laydown

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<sup>40</sup> The term 'waterbird' here refers to all wildfowl (ducks, geese and swans), waders, rails, divers, grebes, cormorants, herons, gulls and terns.



area. However, four common snipe *Gallinago gallinago* were flushed from the Site in the November 2022 survey. .

Redshank *Tringa totanus* and black-headed gull *Croicocephalus ridibundus* (both SCI species) were recorded foraging /roosting in the creek immediately south of the Designated Development during all low tide visits. Peak counts of these species within the creek were of 12 redshank (November 2022) and 37 black-headed gull (December 2022). Curlew (SCI species) was also recorded foraging in this creek in December 2022 and January 2023, both were records of a single bird. Other waterbird species, which although not specifically named as SCI species would fall under the Wetlands and Waterbirds SCI feature of the SPA, were also recorded within the survey area. This included kingfisher and little egret (both species are listed on Annex I of the Birds Directive) which were recorded roosting / resting in the creek area immediately south of the Designated Development.

Beyond 150m from the Designated Development, but still within the 500m survey buffer, greenshank *Tringa nebularia* and dunlin *Calidris alpina* (SCI species) were also present, in addition to grey heron *Ardea cinerea*, mallard *Anas platyrhynchos* and oystercatcher *Haematopus ostralegus*, which are all waterbird species.

Redshank, greenshank, curlew, and black-headed gull (which are all named SCI species) were present foraging or roosting in the creek area immediately to the south of the Designated Development, in addition to kingfisher and little egret (which are both waterbirds).

Dunlin, redshank, and cormorant (SCI species) were recorded foraging and roosting along the intertidal habitat to the west of the Designated Development, in addition to oystercatcher, herring gull *Larus argentatus* and little egret. Further away from the Designated Development, curlew, great crested grebe *Podiceps cristatus*, great northern diver *Gavia immer*, wigeon, teal and mallard were all recorded.

### **High Tide Survey**

No named SCI species of the River Shannon and River Fergus Estuaries SPA were recorded within the Site of the Designated Development, including the construction laydown area. However, four common snipe were again flushed from the Designated Development Site during the November survey.

Redshank, greenshank, dunlin, curlew, teal and black-headed gull (which are all named SCI species) were present foraging or roosting in the creek area immediately to the south of the Designated Development, in addition to kingfisher and little egret (which are both waterbirds).

Dunlin, redshank and cormorant (SCI species) were recorded foraging and roosting along the intertidal habitat to the west of the Designated Development, in addition to oystercatcher, herring gull *Larus argentatus* and little egret. Further away from the Designated Development, curlew, great crested grebe *Podiceps cristatus*, great northern diver *Gavia immer*, wigeon, teal and mallard were all recorded.

Further details of the assessment of the Designated Development for non-breeding birds is outlined in the NIS including the interpretation of other previous surveys conducted in 2010/2011 reported by NPWS in the Conservation Objectives Supporting Document for the River Shannon and River Fergus Estuaries SPA (see Section 3.2 of the NIS).

## Otter

AECOM surveyed for otter along all watercourses and waterbodies within the Site of the Designated Development plus a 150m buffer, as far as safe access permitted in November 2022. Otter are legally protected from disturbance in addition to direct effects upon breeding and resting sites. No evidence of otter was identified within the Site during the targeted otter survey and no resting site were identified. The Site and immediate surrounds have very limited opportunities for resting otter sites as no suitable features are present. On the basis of these survey results, it is considered very unlikely that there are any otter resting sites within at least 150m of the Designated Development.

## Bats

There is no potential for roosting bats as none of the structures present on the Site have been assessed to have bat roost suitability. There is limited potential for foraging bats, however they would be habituated to the existing conditions of the Site (for example including existing artificial lighting) so it is not considered likely that the Designated Development would affect them given the absence of other possible roosting features such as woodland/trees within immediate proximity, combined with the relatively 'exposed' and operational / well-lit nature of the Site.

## Other species

The presence of freshwater habitats on Site appears to be absent notwithstanding a large man-made attenuation / fire lagoon located within the eastern extents of the power station site. The Site is unlikely to be suitable to support breeding amphibians including legally protected species i.e., common frog *Rana temporaria* or smooth newt *Lisotriton vulgaris*.

### 4.4.3 Likely Main Effects

Within the context of the baseline ecological conditions summarised, potential ecological effects of the construction and operation of the Designated Development are predicted.

Potentially the most significant ecological constraint to the Designated Development is the Site's location immediately adjacent to the Shannon Estuary and namely the River Shannon and River Fergus Estuaries SPA and Lower River Shannon SAC designations. Whilst there will be no direct effects (loss or damage to designated habitats or features) upon the SPA or SAC (the Designated Development boundary is separated by an existing fence line which will be retained), indirect effects upon the designated features (habitats and species) could occur. The AA Screening Report (AECOM, 2022a) concluded that likely significant effects on the qualifying features of these European sites, from at least one source of impact of the Designated Development, could not be ruled out.

In summary the following potential effects could occur as a result of the Designated Development upon ecological features (designated site, habitats, and species):

- Construction
  - River Shannon and River Fergus Estuaries SPA - Loss of functionally linked habitat (habitat which could support SPA SCI species)
  - Indirect effects upon SAC designated habitats, due to air or waterborne pollution; changes in hydrological conditions (quantity and quality);

- Loss and disturbance to habitats within the Site; and
  - Disturbance effects upon SCI/protected/notable species from increased/changes to noise, lighting or changes in site conditions influencing species movements/dispersal/foraging.
- Operation
    - Disturbance to species and habitats from the operation of the Designated Development.

The magnitude of predicted effects upon ecological features has been considered based upon the information available at the time of writing. The potential likely significant effects upon the SPA and SAC designations (including those located more than 2km from the Site) are considered in the NIS (AECOM 2023).

### Do Nothing Scenario

If the Designated Development were to not go ahead, then the ecological baseline would likely remain much the same.

#### 4.4.4 Construction Phase - Mitigation Measures

Mitigation measures that will be adhered to during the Site clearance, and construction phase are as follows:

- The Contractor will comply with requirements of *The Wildlife Acts of 1976 and 2012 as amended ("The Wildlife Act") and the Flora (Protection) Order, 2022* when undertaking any works which will affect protected species.
- In accordance with the requirements of The Wildlife Act, no works will be undertaken to any habitat (including buildings) in which any birds may be nesting without prior surveys being undertaken.
- A Final CEMP will be prepared for approval by KCC, prior to commencement of construction works associated with the Designated Development, this will be based upon the Framework CEMP (Appendix B). This document will set out the measures to be implemented to ensure there is no pollution of watercourses, waterbodies, or terrestrial habitats, in accordance with guidelines such as Construction Industry Research and Information Association's (CIRIA) Control of water pollution from construction sites (CIRIA, 2001).
- Whilst the requirement to obtain specific protected species licences prior to construction of the Designated Development has not been identified, the Contractor, where required will consult and comply with the requirements of CEMP and NIS (AECOM, 2023d) with respect to any sites or species protected by law. Furthermore, to ensure compliance with the NIS, there will be no works directly within the boundary of any European site.
- An Ecological Clerk of Works (ECoW) will be employed on a full-time basis for the duration of the construction and decommissioning of the Designated Development. The ECoW will be

responsible for monitoring and ensuring the implementation of all mitigation measures and compliance with legislative requirements in relation to ecological features.

- The Contractor will be responsible for ensuring all site workers are briefed on the ecological sensitivities of the Site and its environs through 'toolbox talks' and provision of clear information about protected species and restricted areas and activities. All staff (including sub-contractors) will receive regular updated talks and briefings.
- Measures as set out in the NIS (AECOM, 2022d) will be adopted to address potential disturbance effects upon QI/ SCI species and habitats. All construction / decommissioning phase noise reduction measures will be outlined in the CEMP.

### **Fencing/ Buffer Zones, Compounds and Storage of Materials**

During the works, the contractor will provide a fence between the Site including the temporary construction area, laydown areas and the adjacent areas. This will limit construction works within the confines of the Site.

#### **4.4.4.1 Protection of Birds**

The Site is predominantly covered by hardstanding associated with the existing Power Station. Where the Contractor is required to remove hardstanding etc., they will adhere to the following:

- Mitigation measures detailed in the NIS will be implemented in full in order to address potential effects upon SPA qualifying species.
- In accordance with the requirements of The Wildlife Act, no works will be undertaken to any structure which any birds may be nesting.
- Any necessary vegetation clearance, which has been identified as minimal following site visits, will, if possible, occur outside the bird-breeding/ nesting season (i.e., undertaken between September and February inclusive) and will be preceded by a check by an ornithologist, especially for the potential presence of early or late nesting species.
- If clearance cannot be undertaken outside of the breeding bird season, then the Site will be checked for breeding birds by the ECoW immediately before clearance commences, any identified active nests will be left until the hatchlings have fledged.
- For reference, the breeding bird season is generally taken as the 1<sup>st</sup> March until 31<sup>st</sup> August inclusive. However, it is also noted that birds can nest at any time of the year and are therefore protected when they do.
- All cleared material of bird nesting potential will be moved and stored off-site to ensure that birds do not use the cleared material for nesting during the bird breeding season. Similarly, stockpiles of earth (particularly sandy material) will be left without vertical faces during the spring and summer period.
- The Contractor's programme will clearly indicate any areas to be removed and their programmed schedule for removal.

- An acoustic barrier, of between 4m and 8m in height, will be installed along the edge of the southern, western, and northern perimeters of the Designated Development Site for the construction and decommissioning phases, as shown on Figure 12 of the NIS. This will be installed so as to ensure no gaps between joints or the ground and will be inspected and maintained throughout the periods that works are taking place. This barrier will reduce noise levels experienced by birds (and other animals) within the River Shannon and River Fergus Estuaries SPA and Lower River Shannon SAC.

#### 4.4.4.2 Protection of Otter

The following mitigation measures will be implemented and adhered to for the protection of otter on Site:

- Construction works will take place within a clearly demarcated area and a buffer zone to the River Shannon will be incorporated to ensure no encroachment into riparian habitat.
- A pre-works survey for otter will be carried out prior to the commencement of construction or decommissioning works, specifically as a minimum in potential laydown areas immediately adjacent to the River Shannon.
- Any excavations will be left with a method of escape for any animal 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, to ensure no animals become trapped.
- Within the Designated Development Site, all vehicles will be restricted to a maximum speed of 20km per hour. This will help to minimise the risk of collision with mammals, including otter.

#### 4.4.5 Operational Phase – Mitigation Measures

Operational mitigation measures are limited to:

- Lighting - As detailed in Section 3 of the NIS (AECOM 2022d), any permanent lighting required during the operational phase will be restricted to the absolute minimum required for security and safety purposes, to reduce operational disturbance effects upon SCI species associated with the Shannon Estuary designations. It will be designed using appropriate design software (such as Lighting Reality PRO) so that light levels at the Shannon Estuary and the creek to the immediate south of the Designated Development do not increase from the current baseline by more than 0.2 lux (this being the approximate brightness of a full moon (Austin et al, 1976)). No direct illumination of the Shannon Estuary or creek to the south of the Designated Development will be permitted.

No other operational ecological mitigation measures are proposed.

#### **4.4.6 Residual Effects**

Based upon the assessment of the information available as outlined above, with the embedding of design mitigation and project specific construction and operational mitigation, no residual significant adverse effects on ecological features are predicted.

In particular, the NIS concluded that there will be no adverse effects on the integrity of any European site from the Designated Development, either alone or in-combination with other plans or projects.

## **4.5 Population and Human Health**

### **4.5.1 Introduction**

This section presents information on the likely main effects of the Designated Development on Population and Human Health.

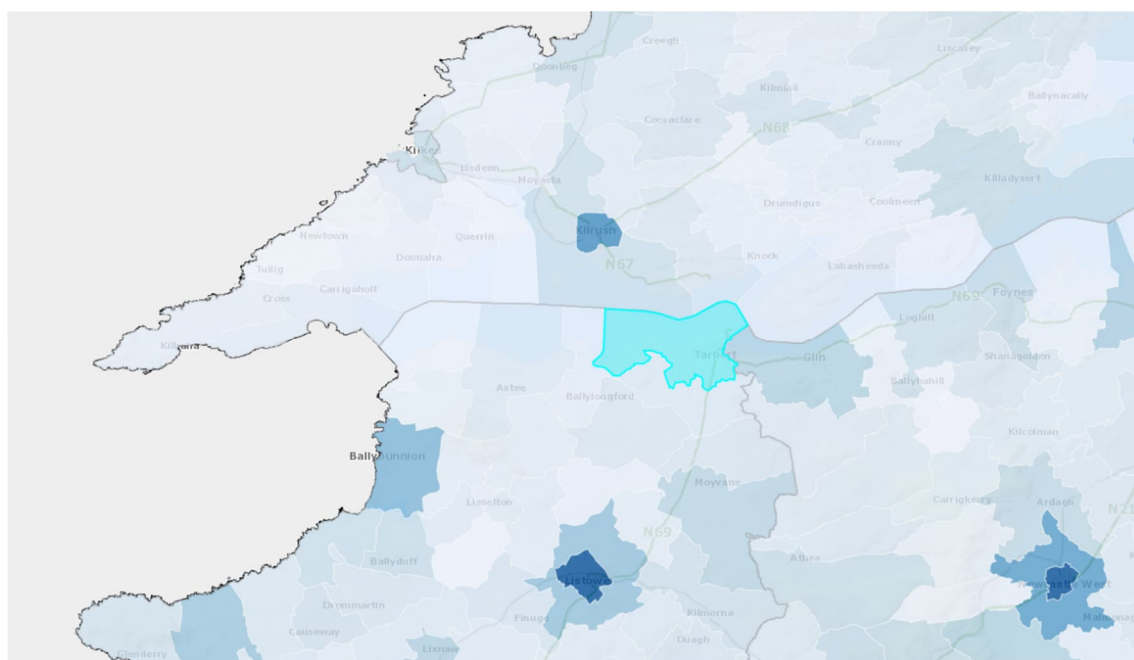
Due to the historical and existing industrial nature of this Site, the Designated Development will be homogenous within the Site. The mitigation measures provided in the Framework CEMP (refer to Appendix B), notably the general site mitigation measures will reduce the potential for significant effects upon human receptors within the adjacent area.

The potential population and human health effects as a result of the Designated Development, will arise from air quality, climate noise and vibration, visual and traffic effects.

Effects arising from the process of decommissioning of the Designated Development are of a similar or lesser nature and duration to those arising from the construction process and therefore have not been considered separately in this section. Where this assessment refers to potential construction effects, these are also representative of predicted decommissioning effects.

### **4.5.2 Baseline**

The study area for the population and human health assessment has considered the area of land that encompasses the likely effects of the Designated Development. The area used for the baseline comprises the electoral division (ED) of Tarbert (refer to Plate 4.9), as this is where the majority of population and human health effects are likely to occur. Where possible, baseline data is presented at the ED level with a comparison to Co. Kerry and State level also provided.



**Plate 4.9: Tarbert ED highlighted**

#### **4.5.2.1 Population and Demographics**

The most recent Census was carried out by the Central Statistics Office (CSO) in April 2022<sup>41</sup>. However, only preliminary 2022 Census data has been released and the full results are not expected until April 2023. The 2016 Census was carried out in April 2016<sup>42</sup>.

To inform the baseline profile, data from the 2022 Census has been analysed where possible. Where 2022 data is not available, 2016 data has been used.

This section describes information on population, age profile, social class, and employment in the study area, and is primarily based on data from the 2016 Census.

According to the 2022 Census, there are 755 persons in the study area of Tarbert ED, a very slight decrease from the 2016 Census, from 761 persons (-6 people). This represented a -0.8% decrease in the local population from the previous 2016 Census. The Co. Kerry population increased between 2016 and 2022. The population increased from 147,707 persons in 2016 to 155,258 in 2022 (a 0.84% increase). The total population of Ireland also increased from 4,761,865 to 5,123,536 (7.6%) over the same period. This is the first time that a census has recorded a population of over five million people in over 170 years.

Table 4.47 shows the age profiles of the population of the study area and its comparator areas in 2016. The age profile is representative of the available labour force and demand for the different types of community facilities in the local area.

The study area, relative to its comparator areas, has an elderly population. Approximately 24% of its residents are over the age of 65, compared to 16.9% of residents in Co. Kerry and 13.4% in Ireland.

<sup>41</sup> CSO (2022). Available at: <https://www.cso.ie/en/releasesandpublications/ep/p-cpr/censusofpopulation2022-preliminaryresults/geographicchanges/>

<sup>42</sup> CSO (2017). Census 2016.

Conversely, the study area has a lower percentage of its population in working age (53%) than Co. Kerry and Ireland (57.4% and 60.3% respectfully).

**Table 4-46: The Proportion of the Total Population in Each Age Bracket for Tarbert (study area) and its Comparator Areas**

**% of total population by age band**

Area	0-4	5-9	10-19	20-24	25-44	45-64	65+
Tarbert	5	7	11	3	23	27	24
Co. Kerry	6.1	7	12.6	4.5	26.1	26.8	16.9
Ireland	7	11.5	7.8	7	29.5	23.8	13.4

Source: CSO, Census 2016

Preliminary demographic data is available from Census 2022 (April 2022) on the population of state, each county and how these have changed since Census 2016, more detailed results are expected to be published between April and December 2023. As of 2022, the Central Statistics Office (CSO) Census recorded a population of 155,258 for Kerry Constituency, an increase of 5.1% on the preceding figure for 2016.

**4.5.2.2 Socio- Economics**

Census data (2016) details that the number of those ages 15 years or over with ‘up to Leaving Cert’ education was 58.9% in 2016, a statistic higher than the regional average of 54.5%. Those with ‘no formal education’ accounted for 0.5% of all those aged 15 years or over, this statistic is lower than the regional average of 2%. Those with a ‘Third Level’ or higher (Level 6 or higher) education accounted for 30.9% of all those ages 15 years and over in 2016. This is equal to the regional average of 30.9%.

A breakdown of the population of Tarbert ED by occupation group (in the 2016 Census), indicated that, 24.1% of the population in employment were Managers, Directors and Senior Officials, or work in Professional Occupations. This is higher than Co. Kerry as a whole (19.7%) as well as the national proportion recorded across Ireland (24.8%).

In 2016, the median gross annual household income in Tarbert ED was €35,574 which was lower than the median for Kerry of €37,339.35 and below the median for Ireland as a whole €45,256<sup>43</sup>.

**4.5.2.3 Deprivation**

Deprivation data is published by the Pobal HP Deprivation Index using 2016 Census data. A score of 0 represents a mean level of deprivation, while a Relative Index Score of <-30 or >30 represent extreme levels of relative deprivation and extreme levels of relative affluence respectively.

Tarbert ED has a Relative Index Score of -7.71, and therefore is considered to be marginally more deprived than the average for Ireland.

<sup>43</sup> CSO (2017). Census 2016.



#### 4.5.2.4 Health

The 2016 Census asked respondents to rate their physical health on a scale from 'very good' to 'very bad'. In the Tarbert ED, 1.6% of the Tarbert population stated that their health was either 'bad' or 'very bad', which is same as the percentage recorded in Co. Kerry, but 0.1% lower than the percentage recorded for Ireland (1.7%).

#### 4.5.2.5 Social Infrastructure

The nearest settlement is the town of Tarbert, located approximately 1.8km south of the Designated Development Site on Co. Kerry's border with Co. Limerick. The town is small and has a population of approximately 540. However, it has a high street offering a range of services and has community facilities including schools. The town is identified as a 'Tier 3' town in the Kerry County Development Plan 2022 – 2028 Issues Paper (2020) which designates towns into tiers based on population size and the range of services / functions they provide to the surrounding hinterland.

Tarbert Health Centre is located within the town and is the nearest health centre to the Site. The nearest hospital is located in Killarney, approximately 78km from the Designated Development Site. The nearest school is Saint Mary's National School (Primary School), approximately 3km to the south of the Designated Development Site. Other social infrastructure in Tarbert includes St, Mary's Church, Tarbert Garda Station, and Tarbert Community Playground.

### 4.5.3 Likely Main Effects

#### Do Nothing Scenario

In the absence of the Designated Development, there would be no changes to the baseline population and human health receptors.

#### 4.5.3.1 Construction phase

The likely main effects of the Designated Development on population and human health during the construction phase associated with the Designated Development will be in relation to air quality, climate, noise, visual impact, and traffic. These potential impacts are addressed in the corresponding sections of this report, as follows:

- Section 4.2: Air Quality
- Section 4.3: Noise and Vibration
- Section 4.8: Climate
- Section 4.11: Landscape and Visual
- Section 4.12: Traffic Management.

During the construction phase, employment opportunities will be created as a result of the Designated Development. These jobs will be temporary in nature but will result in a *slight positive* economic impact.

There will be a potential increase in the population in the area during the construction phase. However, this will be temporary, and may have a potential *slight negative* impact on the local population, but it is considered that there will be sufficient accommodation capacity in the area.

During the construction phase, HGV traffic, general delivery traffic and site operatives will be required to travel to and from the Site. The Tarbert Power Station Site has its main access from the N67. The Site will be accessible via the two existing accesses from the N67 for the construction phase traffic.

The construction phase traffic will lead to an increase in the number of vehicles using the main junctions through the town of Tarbert onto the N67, however, the increase is not expected to lead to junctions in the area becoming over capacity, therefore congestion is not expected to become an issue, therefore a *negligible* impact is expected. A Framework CTMP has been prepared, refer to Appendix C.

As noted above, the Designated Development has the potential to impact human health as a result of changes in local air quality, climate, and noise, during the construction phase. These impacts are discussed in the relevant sections of this report.

As the study area is predominantly rural in nature with limited public transport available, local residents rely heavily on the local and regional road network to access services, workplaces, and local facilities.

The construction phase will cause an increase in traffic, although it is likely it will not lead to congestion.

#### **4.5.3.2 Operational Phase**

The operational phase of the Designated Development will require a number of staff to travel to and from the Site which will be operated, maintained, and managed by SSE personnel. The increase in vehicles on the road network is not expected to lead to any congestion. Therefore, the Designated Development is expected to have no impact.

A negative human health impact is possible due to the impact of the Designated Development on GHG emissions and climate change.

#### **4.5.4 Construction Phase – Mitigation Measures**

The Contractor will be responsible for the security of the Site and will be required to:

- Install adequate Site hoarding to the Site boundary.
- Maintain Site security staff at all times.
- Ensure restricted access is maintained to the works.
- Operate a Site induction process for all Site staff.
- Ensure all Site staff shall have current 'safe pass' cards.
- Separate pedestrian access from construction at the main Site entrances provide a safe walkway for pedestrians along the site entrances.

The Contractor's CEMP will detail the Contractor's overall management and administration of the works. The CEMP will be implemented during the construction phase to safeguard the environment, site personnel, and nearby receptors, *i.e.*, occupiers of residential and commercial properties, from site activities which may cause harm or nuisance.

The Contractor will establish communications with local community representatives throughout the construction period.

Air quality impacts can arise from many sources during the construction phase. Emissions from the construction phase are transient in nature and will include emissions from vehicles and plant, and dust-raising activities from earthworks and construction processes utilising concrete and aggregates. Dust and air pollution, including odours, can cause disruption to properties and the public adjacent to the construction works, and can also have adverse impacts upon other environmental receptors, including watercourses and ecologically designated sites.

Air quality mitigation and general control measures are described in Section 4.2. All construction works will be carried out in such a manner that emissions of dust and other pollutants are limited, and that best practicable means are employed to minimise disruption, risks to human health, and to avoid unnecessary impacts on sensitive ecological habitats.

Noise and vibration impacts may arise from a wide variety of sources during the construction phase and to varying degrees during the course of the works, depending upon the stage of works. Noise and vibration mitigation and general control measures are described in Section 4.3.

A Framework Construction Traffic Management Plan (CTMP) has been prepared, refer to Appendix C. This will be updated by the appointed Contractor to mitigate any impact of construction on the surrounding road network. Traffic and transport mitigation and general control measures are described in Section 4.12.

#### **4.5.5 Operational Phase – Mitigation Measures**

No mitigation measures related to Population and Human Health are proposed during the operational phase. However, mitigation for air quality, noise and vibration, climate, and traffic and transport, are proposed in the relevant sections of this report.

#### **4.5.6 Residual Effects**

Following the implementation of the above mitigation measures and the measures in the Framework CEMP (refer to Appendix B), it is unlikely that there will be any residual effects on population and human health during the construction phase of the Designated Development.

There is the potential for a residual impact on air quality during the construction phase of the Designated Development, from dust emissions. However, following the implementation of the mitigation measures outlined in Section 4.2 (Air Quality), it is unlikely that there will be any residual effect.

Following the implementation of the mitigation measures outlined in **Section 4.3** (noise and vibration), it is unlikely that there will be any residual effects on population and human health from noise and vibration impact.

No residual effects are anticipated on population and human health during the operational phase of the Designated Development.

## 4.6 Land and Soils

### 4.6.1 Introduction

This section of the report assesses the likely main effects of the Designated Development on land, soil and geological aspects of the Site and surrounding area.

The Site of the Designated Development is a brownfield site, part of the operational Tarbert Power Station Site and bound by a tidal mudflats to the south. The Site comprises hard standing with internal roadways, a helipad, and generally unused spaces of land. The earthworks required for the Designated Development are continuing to be investigated as at the time of writing this report the Ground Investigation works were not yet completed, earthworks and removal of material off site will be required with estimates of 29,000m<sup>3</sup> of cut and 7,000m<sup>3</sup> of fill. The plant will be located on a concrete pad or pre-prepared level area. A site investigation to confirm ground conditions will be conducted to inform works on the Site.

### 4.6.2 Baseline

On site disposal of power station waste was practised until the mid-1990s, with three waste disposal areas used over the site's history. All of these areas are outside of the Site and capping works on these landfill areas was undertaken in 2006 and 2007 under EPA approval.

A number of localised incidents relating to heavy fuel oil losses to ground are known at the SSE Tarbert site, most recently one to the northeast of the turbine hall in May 2022.

OSI maps show that that historical land use at the Designated Development was as low-lying grassland land. The island portion of the SSE Tarbert site east of the Designated Development was divided into fields and included with several piers and slipways, a lighthouse and previous naval artillery facilities prior to the construction of the original Tarbert Power Station.

GSI/ Teagasc databases<sup>44</sup> and previous site investigations show:

- 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. The bedrock geology underlying the Site consists of the Shannon Group of undifferentiated mudstones, siltstones, and sandstones. Bedrock outcrops are shown along the shoreline and fault lines are not indicated to be present in the area.
- Previous investigations completed on the island found bedrock, consisting of dark grey 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 (approximately 25°) towards the east.
- A site investigation in the island in 2022 encountered bedrock 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 southwest portion of the island, suggesting quite variable top of bedrock elevations across the island.

<sup>44</sup> <https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx> consulted 19/12/2022

- Soils/subsoils, and potentially bedrock, are likely been removed or reworked in places during construction of the existing Tarbert power station facilities.

GSI databases also indicate:

- No active quarries producing sand and gravels and / or crushed stone within 10km of the Designated Development Site.
- No audited or unaudited geological heritage sites within 10km of the Designated Development.
- A mineral locality (3142 Tarbert Island) is recorded on the southeast shoreline of Tarbert Island, within 400m of the Designated Development, associated with bands of decomposing ironstone noted on historical mapping. A second ironstone mineral locality (3141 Tarmonhill) is mapped 5km south of the Designated Development. No other mineral localities are mapped within 10km of the Site on the south side of the Shannon Estuary, however several mineral localities associated with coal or flagstones and slates are recorded by GSI on the north side of the Shannon Estuary, within 2.5 and 10km from the Designated Development (minerals localities refs: 1820, 1825, 1826, 1827, 1928, 1929)
- There are no recorded landslide events within 10km of the Site.
- There is a very low risk of seismic (earthquake) activity at the Site of the Designated Development, as earthquake activity in Ireland is very low<sup>45</sup>.
- There is no risk from volcanic activity (no active volcanoes in Ireland).
- In terms of other potential geohazards, EPA data<sup>46</sup> indicates the Designated Development is in a Moderate Radon Area (where 1 in 10 home may have high radon levels), with an area of High Radon Risk mapped in the south-eastern portion of Tarbert Island (i.e., where 1 in 5 homes may have high radon levels).

Based on the TII methodology (2009) criteria for rating site importance of geological features, the importance of the bedrock and soil features at the Site of the Designated Development is rated as 'Low importance' due to the presence of an uneconomically extractable mineral resource suggested by the adjacent Tarbert Island ironstone mineral locality mapped by GSI and within the already-developed power station site.

### 4.6.3 Likely Main Effects on Environment

#### Do Nothing Scenario

In the absence of the Designated Development, no significant changes to soil and geological resource receptors, and indirectly to surface water, groundwater, and human health receptors, are likely to occur under the current regime low-level site management. The existing Tarbert Power Station is due to close by the end of 2023.

#### Construction Phase

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<sup>45</sup> Environmental Impacts of Unconventional Gas Exploration and Extraction (UGEE) (2014-W-UGEE-1) - Final Report 2: Baseline Characterisation of Seismicity, UGEE Joint Research Programme, Environmental Protection Agency, 2016  
[https://www.epa.ie/publications/research/ugEE-joint-research-programme/EPA---UGEE-SR2\\_web.pdf](https://www.epa.ie/publications/research/ugEE-joint-research-programme/EPA---UGEE-SR2_web.pdf)

<sup>46</sup> <https://www.epa.ie/environment-and-you/radon/radon-map/> consulted 19/12/2022

The scoping process has identified that the introduction of the Designated Development would potentially result in different types and durations of impact on soils and geological receptors, during the construction phase. Likely predicted impacts are described below .

As outlined in Section 2, there are limited below ground elements to the Designated Development with the potential to result in impacts on soils and geological receptors.

During the construction phase, the following predicted impacts on soils and geological receptors are likely to occur, without the proposed mitigation:

- Temporary impacts on soil structure as a result of soil excavation, smearing and compaction;
- Temporary impacts on soil chemistry as a result of spillages of oils, fuels, or other construction chemicals, or through the mobilisation of existing contamination following ground disturbance;
- Impacts on surface and groundwater water quality due to deposition or spillage of soils, sediments, oils, fuels, or other construction chemicals/ wastewater, or through mobilisation of contamination following disturbance of contaminated ground, sediments, or groundwater, or through uncontrolled site run-off;
- Potential increase in volume and rate of surface water runoff from new impervious areas during construction, leading to an impact on flood risk;
- Increased risk of groundwater flooding or recharge as a result of any below ground excavations;
- Alteration in overland flow paths as a result of works associated with the Designated Development; and
- Temporary impacts on off-site receptors through the inhalation of potentially contaminated dust and dermal contact with contaminated soil following ground disturbance.

Construction activities such as earthworks, excavations, site preparation, levelling and grading operations result in the disturbance of soils. Exposed soil is more vulnerable to erosion during rainfall events due to loosening and removal of vegetation to bind it, compaction, and increased runoff rates. Surface runoff from such areas can contain excessive quantities of fine sediment, which may eventually be transported to watercourses where it can result in adverse impacts on water quality, flora, and fauna. This sediment could contain contaminants, particularly in the vicinity of the existing power station and fuels storage tanks. The potential impacts of fine sediment on water quality, flora and fauna are addressed in Section 4.6 Water, while the potential impacts of soil contaminants on water quality are addressed herein.

During construction, fuel, hydraulic fluids, solvents, grouts, detergents, and other potentially polluting substances will be stored and/ or used on site. Spillages of these substances could pollute nearby surface watercourses or underlying aquifers if their use or removal is not carefully controlled, and spillages enter existing flow pathways or waterbodies directly. The potential impacts of spillages on water quality, flora and fauna are addressed in Section 4.6 Water, while the potential impacts of the migration of these spillages within the subsurface on water quality are addressed herein.

During construction, groundwater may be encountered in excavations and dewatering may be required. The potential impacts of construction dewatering and subsequent discharging on surface and groundwater receptors are addressed in Section 4.7.

The potential impacts of construction on ground stability have been scoped out of the impact assessment for the following reasons:

- There are no records of historic mine workings or reported karst features within the Site.
- Therefore, it is very unlikely that ground instability as a result of underlying karst will be an issue during construction, operation, or decommissioning of the Designated Development.

### Operational Phase

- During the operational phase of the Designated Development, the following likely predicted impacts on soils and geology receptors could potentially occur, without the proposed mitigation:
- Impacts on soil chemistry as a result of accidental spillages or leakages from stored distillate fuel into the subsurface;
- Impacts on surface and groundwater quality through the migration of introduced contamination as a result of accidental spillages or leakages from the underground pipework and/ or locally stored distillate fuel into surface and groundwater receptors; and
- Impacts on groundwater quality as a result of the removal/ treatment/ mitigation of any encountered soil contamination.

### Decommissioning Phase

The operational life of the Designated Development is anticipated to be up to five years. After this time, the temporary emergency generation plant will be disconnected, dismantled, and removed from the Site.

Prior to any decommissioning, a Decommissioning Plan (including a Decommissioning Environmental Management Plan) will be produced and agreed with the EPA as part of the IE Licence amendment process. An environmental Baseline Assessment report at time of commencement of operations will be referred to and updated to determine if any contamination has occurred and what, if any, rehabilitation is required prior to IE Licence amendment.

The predicted impacts on soils and geological receptors likely to occur during the decommissioning phase are anticipated to be similar to those likely to occur during the construction phase with the exception of the impacts relating to unidentified contamination. The likely predicted impacts are as follows without the proposed mitigation:

- Temporary impacts of soil structure due to soil stripping, smearing and compaction;
- Temporary impacts on soil chemistry as a result of spillages of oils, fuels, or other construction chemicals, or through the mobilisation of contamination following ground disturbance; and
- Temporary impacts on surface and groundwater quality through the migration of introduced contaminants as a result of spillages

#### 4.6.4 Construction Phase – Mitigation Measures

It is considered that the construction phase of the Designated Development will not result in significant impacts on hydrology and hydrogeology of the Site. Potential impacts could include increase in surface water run-off and sediment from excavations and potential contamination from spills or leaks.

Mitigation measures described within Section 4.6 are applicable and relevant for the protection of land and soils during the construction phase activities.

The following mitigation measures have either been incorporated into the design (i.e., embedded mitigation) or are standard construction or operational practices. These measures have, therefore, been taken into account during the impact assessment.

Prior to construction starting onsite, a Final CEMP will be prepared by the Contractor to be approved by the planning authority. The Final CEMP will detail the measures necessary to avoid, prevent and reduce adverse effects where possible upon soil and geological receptors.

To minimise the potential for adverse impacts to soil structure and quality during construction, the following are the mitigation measures that will be in place:

- Soil material will be stored temporarily within the Site in managed stockpiles that will not be allowed to dry out, to avoid generation of wind-blown dust;
- Any stockpiled material will be managed in accordance with best practise guidelines (such as Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (2009)). When required, pre-earthwork drainage will be put in place to avoid sediment being washed off site and will be included in the CEMP; and
- The Contractor will be required to prepare a Construction Traffic Management Plan (CTMP) to minimise site traffic and, if relevant, damage to soil structure from smearing and compaction (see Appendix C for a Framework CTMP).

To minimise the potential for adverse impacts to soil chemistry and to water quality during construction, the mitigation measures that will be in place:

- The construction of the Designated Development will be in accordance with good practice as detailed within the Framework CEMP (Appendix B).
- The E&C Contractor will be required to include measures in the CEMP for minimising erosion by reducing disturbance and stabilising exposed materials. The plan will also consider control measures to minimise the release of mobilised sediment. The CEMP will also include methods of handling and storing chemicals and fuels, followed by an Emergency Response Plan to be implemented in the event of a spill or leak.
- Water quality monitoring will be undertaken pre and during-construction, details of which will be included in the Contractor's CEMP. This will be based on a combination of visual observations, in situ testing using handheld water quality probes, and periodic sampling for laboratory analysis.



- The E&C Contractor will be required to ensure the safe storage of any hazardous materials or chemicals required onsite. Storage areas for flammable/ toxic/ corrosive materials will be located in a separate, locked, impermeable bunded and fenced off area. Material data sheets will be available for all these materials and the COSHH (Control of Substances Hazardous to Health) assessments kept within the relevant Risk Assessment for the task, all subject to the Applicant's approval. Storage will not be within 30m of a watercourse and designated storage areas will be bunded to 110% of storage capacity to contain the effects of any spills. These areas will be cleared and re-instated following completion of the Site.
- A Resource Waste Management Plan (RWMP) (refer to Appendix B) will be prepared, and all relevant contractors will be required to seek to minimise waste arising at source and, where such waste generation is unavoidable, to maximise its recycling and reuse potential. Recycling of materials will take place off-site where noise and dust are more easily managed and less likely to impact on surrounding properties.
- Should significant contamination occur as a result of construction stage activities, KCC and the EPA will be notified, and corrective actions will be agreed.
- If water is encountered during below ground construction, suitable best practice de-watering methods will be used. No significant groundwater dewatering is anticipated but, if required, will be undertaken as outlined in Section 4.7.
- Construction works will be carried out in such a way as to prevent, contain, or limit, as far as reasonably practicable, any adverse effects arising from the presence of contaminated land or materials (if encountered) these measures are as follows:
  - A contamination watching brief/environmental oversight to ensure that any significant contamination not identified during previous site investigations is recorded and dealt with appropriately;
  - Should ground with significant levels of unknown contamination be encountered during construction, working methods and procedures for handling and disposal of material will be employed to minimise risk in line with the EPA's "Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites". If required, the material will be disposed of at a suitably licensed waste facility;
  - 'Clean' and 'dirty' (contaminated) work areas will be divided by internal fencing if contamination is encountered;
  - Personal Protective Equipment (PPE) will be worn by ground workers and other staff;
  - Those potentially at risk will be made aware of potential site hazards via site safety induction and toolbox talk procedures.

To minimise the potential for adverse impacts to off-site receptors and construction workers, the following is an outline of the mitigation measures that will be in place:

- The Contractor has a duty under the Safety, Health, and Welfare at Work Act 2005 and the Control of Substances Hazardous to Health (COSHH) Regulations 2002 to protect their

employees against hazardous substances encountered at work. To that end and in accordance with *CIRIA guidance R132 A Guide for Safe Working on Contaminated Sites*<sup>47</sup>, the Contractor will be required undertake a COSHH assessment before any work is carried out at the Site which is likely to expose staff to substances hazardous to health. Even if no hazardous substances are identified during the planned site investigation, it would be best practice for the Contractor to ensure that all employees (construction workers) are issued with PPE appropriate to the hazards identified. PPE could consist of hazard-specific gloves, eye protection and respiratory protective equipment (RPE).

- The Contractor will implement measures to minimise the amount of dust produced during the construction phase, including the preparation of a plan detailing dust management measures. There will be a Duty of Care on the E&C Contractor to ensure that dust-raising activities are located away, and upwind where possible, from sensitive receptors as much as feasibly possible, the duration will be kept to a minimum when in proximity to a receptor, and the spread of dust will be controlled by judicious use of water, the most effective and efficient way being in the form of a fine spray.

Comprehensive Site Investigations (SI) will be undertaken prior to construction to confirm the existing ground conditions and will inform the siting and layout of the Designated Development.

It should be noted that the Designated Development involves limited excavation and will be constructed in accordance with current engineering standards, including site investigation and understanding of ground conditions to inform construction works and design.

Mitigation measures for construction works including soil handling are incorporated into the CEMP to be implemented by the E&C Contractor who will conduct the works. Should KCC consider independent supervision of these works to be required at the expense of the developer, the Applicant would be agreeable to this being implemented through an appropriately-worded planning condition.

#### **4.6.5 Operational Phase – Mitigation Measures**

To minimise the potential for adverse impacts to soil chemistry and water quality, the following is an outline of the general mitigation measures that will be in place:

- The Designated Development will be licensed by the EPA. An application to alter the existing IE licence or an application for a new IE licence will be made to the EPA for the new installation. The IE licence sets out to limit and minimise the impacts to air, soil, surface and groundwater, and the effects on environment and human health.
- The Designated Development will be operated in line with appropriate standards and the operator 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 Designated Development is operating to the appropriate standard.

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<sup>47</sup> CIRIA (1996).

- If required by the licence requirements or conditions in relation to the application, sampling, and analysis of potential pollutants in surface waters and groundwater will occur. This includes monitoring emissions levels in accordance with the IE Licence.
- To prevent the risk of spillages, flooding, fire, and other potentially major incidents, several measures will be in place. These include compliance with all relevant health, safety, and environmental legislation; design, build and operation in accordance with industry practice; regular maintenance and inspections to reduce the risk of equipment failures; bunded or double skinned storage areas; good and regular housekeeping; and spill kits stored on Site.

Water quality monitoring will be undertaken post-construction, details of which will be included in the IE Licence. This will be based on a combination of visual observations, in situ testing using handheld water quality probes, and periodic sampling for laboratory analysis.

#### 4.6.6 Residual Effects

##### Construction Phase

###### *Land and soil resources*

No impact to or removal of agricultural land is proposed or to soil resources is envisaged and all works are on Made Ground within the existing Tarbert Power Station Site boundary.

###### *Designated Sites – SAC, SPA NHA and pNHA*

There are a number of designated sites bordering the Designated Development. Section 4.4 Biodiversity states that, due to the embedding of design mitigation and project specific construction and operational mitigation, no residual significant adverse effects on ecological features are predicted. In particular, the NIS concluded that there will be no adverse effects on the integrity of any European site from the Designated Development, either alone or in-combination with other plans or projects.

###### *Surface Water*

There is a possibility that, if soil contamination is exposed or disturbed during construction or caused by spillage during construction or operation, it could reach the identified surface water receptors bounding the Designated Development. Given the implementation of the mitigation measures as described in Section 4.7, including implementation of the CEMP, and the fact that there are no direct works to the coastline or foreshore, no residual significant adverse effects on geological features or surface waters are predicted.

###### *Groundwater*

There is the potential for contamination exposed or disturbed during construction to reach the identified groundwater receptors and for contaminants to be introduced to the subsurface as a result of spillages, and to migrate into groundwater receptors.

With the implementation of embedded mitigation measures outlined in Section 4.7, including implementation of the CEMP, no residual significant adverse effects on geological features or surface waters are predicted).

###### *Human Health – Construction Workers and Off-Site Receptors*

Potential impacts on human receptors may occur via contaminated dust and dermal contact with contaminated soil for the construction workers, and inhalation of contaminated dust for the off-site

receptors. With the embedded mitigation measures outlined in Section 4.7 and in the CEMP in place, no residual significant adverse effects on geological features or surface waters are likely.

## Operational Phase

### *Land and soil resources*

The Designated Development will not result in a loss of land or change in land use classification, however, there is a possibility that contaminants could be introduced to the subsurface and soil resources as a result of leakages from fuel storage areas or pipelines. Due to the embedding of design mitigation and project specific construction and operational mitigation, no residual significant adverse effects on geological features are predicted.

### *Designated Sites*

There are a number of designated sites bordering the Designated Development. Section 4.4 Biodiversity states that, due to the embedding of design mitigation and project specific construction and operational mitigation, no residual significant adverse effects on ecological features are predicted. In particular, the NIS concluded that there will be no adverse effects on the integrity of any European site from the Designated Development, either alone or in-combination with other plans or projects.

### *Surface water*

The protection of surface water quality and supplies during the operation phase will be achieved through a surface water management/ drainage system and IE Licence discharge requirements. Given the implementation of the mitigation measures as described in Section 4.7, including implementation of the CEMP, and as there are no direct works to the Shannon Estuary and project specific construction and operational mitigation, no residual significant adverse effects on geological features or surface waters are predicted.

### *Groundwater*

There is a possibility that introduced contaminants in soil, as a result of accidental spillages or leakages of stored distillate fuel, could migrate into groundwater receptors. The protection of groundwater quality during the operational phase will be achieved through utilisation of a surface water management/ drainage system, IE Licence provisions and drainage strategy and due to the project specific construction and operational mitigation, no residual significant adverse effects on geological features or groundwaters are predicted.

### *Human Health*

There are no direct or indirect residual impacts anticipated on off-site human health as a result of the Designated Development during the operation phase.

## 4.7 Water

### 4.7.1 Introduction

This section assesses the likely main effect of the Designated Development on the hydrological aspects of the Site and surrounding area.

The nature of the Designated Development dictates that the greatest potential impact on surface waters associated with the development will be during the construction phase. In order to prevent / minimise

potential impacts, mitigation measures will be implemented as part of the construction works on-site. Examples of potential sources of impacts include:

- polluted discharges from the Site;
- discharge of vehicle wash-down water;
- discharge of construction materials, e.g., uncured concrete;
- uncontained spillage of wastewater effluent;
- uncontrolled sediment erosion and contaminated silty runoff; and
- refuelling facilities, chemical and waste storage or handling areas.
- changes to the existing drainage network including interception and redirection of natural and artificial watercourses (e.g., drainage channels); and
- increased runoff from cleared and capped areas (relative to greenfield values).

Effects arising from the process of decommissioning of the Designated Development are of a similar or lesser nature and duration to those arising from the construction process and therefore have not been considered separately in this section. Where this assessment refers to potential construction effects, these are also representative of predicted decommissioning effects.

#### 4.7.2 Baseline

A desk-based review of available information by AECOM water scientists has informed an appraisal of the water environment baseline conditions of the Designated Development Site and surrounds. No site surveys have been undertaken or site investigation works appraised in the preparation of this chapter.

The following sources of baseline information have been reviewed:

- Environmental Report Proposed Battery Storage Facility – Tarbert Power Station, Tarbert Co Kerry. Malachy Walsh and Partners, April 2018;
- 2021 Groundwater Monitoring Report - SSE Tarbert Generating Station. AECOM, March 2022;
- Soil and Groundwater Contamination Review – Tarbert. ERM, 2009;
- Proposed Power Plant at Tarbert, Co. Kerry - Non-Technical Summary. ERM and Mott MacDonald, December 2009;
- [www.gsi.ie/mapping](http://www.gsi.ie/mapping), Geological Survey of Ireland (GSI) map viewer. Accessed January 2023;
- [www.epa.ie/mapping](http://www.epa.ie/mapping), Environmental Protection Agency (EPA) map viewer. Accessed January 2023;
- [www.npws.ie](http://www.npws.ie), National Parks and Wildlife Service (NPWS) map viewer. Accessed January 2023; and
- [www.wetlandsurveys.ie](http://www.wetlandsurveys.ie), Wetland Surveys of Ireland. Accessed January 2023.

#### 4.7.2.1 Surface water

The Water Framework Directive (WFD) (2000/60/EC<sup>48</sup>) requires all Member States to protect and improve water quality in all waters so that good ecological status is achieved by 2015 or by 2027 by the latest. It applies to rivers, lakes, groundwater, and transitional coastal waters. The Designated Development Site is located on Tarbert Island, which is linked to the mainland by a causeway and is bordered by the River Shannon Estuary (IE\_SH\_060\_0300), a Transitional WFD water body, to the north, west, east, and southeast, and is located within the sub-catchment of ASTEE\_WEST\_SC\_010, river sub basins RALAPPANE\_010, and the transitional waterbodies of IE\_SH\_060\_0300 of the Lower Shannon Estuary. The estuary water quality is currently reported by the EPA as unpolluted, as being of 'Good' Water Framework Directive (WFD) status and of 'not at risk of failing to meet good status in 2027'.

The Tarbert River (IE\_SH\_24T010100) flows through Tarbert village and enters Tarbert Bay approximately 1.5km to the south of the Site. The river water quality is currently reported by the EPA as 'Moderate' status and 'not at risk of failing to meet good status in 2027'. According to the EPA, there is no monitoring of hydromorphological conditions planned on the Tarbert River.

The Lower Shannon Estuary is designated as part of the River Shannon and River Fergus Estuaries Special Protected Area (SPA), the Lower River Shannon Special Area of Conservation (SAC), and the Site is within approximately 150m of Tarbert Bay, a proposed Natural Heritage Area (pNHA). The River Shannon and River Fergus Estuaries is designated under the EU Birds Directive, but also for the qualifying interest Wetland and Waterbirds [A999]. The Lower River Shannon SAC is designated for a variety of qualifying interests including estuaries and coastal lagoons.

The Site elevation currently slopes to the southwest. Currently there is no formal drainage collection system on the Designated Development Site.

#### 4.7.2.2 Groundwater

The Designated Development Site is mapped as being underlain by superficial deposits consisting of made ground and tills derived from shales and sandstones, and by bedrock consisting of Namurian Shale, Sandstone, Siltstone and Coal. Previous investigations completed on the Site encountered bedrock, consisting of dark grey siltstone with an upper weathered horizon, at shallow depths of less than 3m across much of the Site. The bedrock is classified as a 'locally important aquifer – which is moderately productive only in local zones' (LI). The superficial deposits are not classified as an aquifer; however, these deposits act as a pathway for surface contamination to reach groundwater in the bedrock aquifer, or in hydrologically linked surface water or coastal water bodies.

The aquifer vulnerability rating for the Site is 'moderate' bounded by areas of 'extreme' vulnerability along the edge of the island, where bedrock outcrops.

The bedrock aquifer is designated as the Ballylongford Groundwater Body (EU Code: IE\_SH\_G\_030), which is classified as having 'Good' WFD status.

Previous investigations completed on the Site encountered groundwater at shallow depths towards the base of the made ground and within the underlying superficial deposits. Groundwater within the superficial deposits at the Site are inferred to flow in a divergent radial pattern towards the estuary and

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<sup>48</sup> [EUR-Lex - 32000L0060 - EN \(europa.eu\)](#)

the cooling water lagoon. Groundwater quality data indicate that groundwater at the site is brackish, with groundwater levels being tidally influenced. In addition, groundwater quality data indicates anaerobic conditions, which can result in naturally enhanced solubility of some metals and have given rise to naturally occurring elevated ammonia concentrations in the southwest of the island.

Based on the available information, there are no groundwater abstraction wells at the Site or within 1km down-gradient of the Site. The closest known well is located approximately 1.1km to the southwest of the Site and is used for agricultural and domestic purposes and has a poor yield. The Tarbert Public Water Supply (PWS) is sourced from a spring located 2.8km to the southwest of the Site. There is no Source Protection Zone (SPZ) delineated for this spring source.

#### 4.7.2.3 Flood Risk

The Site is within close proximity to areas with 'Low' and 'Medium' probability of coastal flooding in an extreme flood event. The OPW flood mapping tool shows no past flood events are recorded on the Site.

A Flood Risk Assessment (FRA) was undertaken for the Site in 2010 as part of a planning application for a 450MW Combined Gas Turbine Power Plant (An Bord Pleanála Ref. P. PA0017). The assessment was summarised as follows within the report:

*"The Detailed Coastal FRA has demonstrated that, owing to the existing character of the frontage, the flood extent for both a 0.5% AEP and 0.1% AEP scenarios, with and without climate change, is expected to inundate large areas of the island including those proposed for development. The extent of flooding is principally controlled by extreme still water levels, and in particular the increase in still water levels (SWL) due to surge. When coincident with a spring tide, surge can elevate the SWL beyond the threshold of much of the island's coastal ground levels providing ingress of estuarial water over the site. An assessment of the nearshore wave conditions has also been carried out to assess contribution to flooding scenarios. The Detailed Coastal FRA has demonstrated that the development proposals are vulnerable to flooding under the events modelled.*

*The model results for the scenarios demonstrate a need to manage the risk of flooding and to safeguard both personnel and infrastructure to support the ongoing generation of power at the site. The Detailed Coastal FRA considers typical solutions for the management of flood risk, to be taken forward as part of the Flood Defence Strategy which will identify preferred options.*

*Access and egress to the proposed development works within the Endesa site boundary during a flood event of 0.1%AEP will be maintained by implementation of appropriate flood defence measures. The Detailed Coastal FRA also considers that the actual shorelink would remain inaccessible to surface emergency access vehicles for a two hour period either side of high tide during an event of 0.1% AEP owing to water depths locally in excess of 1m on the shorelink and associated discharge over the shorelink walls. However, from discussions between Endesa Ireland Limited and the Chief Fire Officer, The Chief Fire Officer has advised that he has no concerns regarding emergency access to the site.*

*The December 2009 Environmental Impact Statement sets out reasons for why the proposed development passes the Justification Test as defined in the Office of Public Works Guidelines for Planning Authorities (November 2009). The Detailed Coastal FRA has assisted in defining the nature and extent of the flood risk for the proposed development, which then allows for provision of suitable flood management and defence options to ensure that the Justification Test is satisfied."*

The report concluded that the Site would need to be protected to a level of 7.35m AOD (Poolbeg) in order to safeguard against a 1/1000 return period for the proposed 450MW CCGT Power Plant development.

Options are being considered but are not assessed within this report.



**Table 4-47: Summary of water environment attributes and baseline condition**

Attribute type	Attribute name	Location	Baseline condition	Data source	Attribute importance/ sensitivity
<b>Surface water/ hydrology</b>					
Transitional water bodies (and quality)	Lower Shannon Estuary (IE_SH_060_0300)	Surrounding the Site to the north, west, east, and southeast west	<ul style="list-style-type: none"> <li>Classified as unpolluted, with Good WFD status and Not at Risk (2021, most recent)</li> <li>Designated as Special Area of Conservation (SAC)</li> </ul>	EPA Map Viewer	Extremely high
	Surface watercourses (and quality)	Tarbert River	Within 1.5km to south of Site	<ul style="list-style-type: none"> <li>Classified as Moderate WFD status and Not at Risk (2021, most recent)</li> </ul>	EPA Map Viewer
Designated sites	River Shannon and River Fergus Estuaries SPA	Surrounding the Site to the north, west, east, and southeast	<ul style="list-style-type: none"> <li>Designated status</li> </ul>		Extremely high
	Lower River Shannon SAC	Surrounding the Site to the north, west, east, and southeast	<ul style="list-style-type: none"> <li>Contains wetland habitats as a qualifying interest and in a favourable conservation condition</li> </ul>	NPWS Map Viewer	Extremely high
	Proposed Natural Heritage Area (pNHA) Tarbert Bay	Within approximately 150m to the south of the Site			Very high
Flood Risk	Designated Development Site classified as a Highly Vulnerable Development due to use for essential infrastructure	Within site boundary	The Site is within close proximity to areas with Low and Medium probability of coastal flooding in an extreme flood event. No past flood events are recorded on the	SSE Renewables (Ireland) Limited	-

Attribute type	Attribute name	Location	Baseline condition	Data source	Attribute importance/ sensitivity
			Site according to the online OPW flood mapping tool.	OPW Online Database	
			The Detailed Coastal FRA has demonstrated that, owing to the existing character of the frontage, the flood extent for both a 0.5% AEP and 0.1% AEP scenarios, with and without climate change, is expected to inundate large areas of the island including those proposed for development.		
<b>Groundwater/ hydrogeology</b>					
	Artificial ground	Within site boundary	Not designated as an aquifer by the GSI	GSI Map Viewer (2022)	Extremely high (likely direct hydrogeological connection between Site and nearby protected sites)
Superficial deposits	Till derived from Namurian sandstones and shales	Surrounding area	Not designated as an aquifer by the GSI	GSI Map Viewer (2022)	Extremely high (likely direct hydrogeological connection between site and nearby protected sites)

Attribute type	Attribute name	Location	Baseline condition	Data source	Attribute importance/ sensitivity
	Alluvium	Surrounding area	Not designated as an aquifer by the GSI	GSI Map Viewer (2022)	Extremely high (likely direct hydrogeological connection between site and nearby protected sites)
Bedrock	Shannon Group, undifferentiated	Underlying site and surrounding area	Locally important aquifer (LI)	GSI Map Viewer (2022)	Extremely high (likely direct hydrogeological connection between site and nearby protected sites)
Groundwater abstractions/ supplies	Private abstraction well (within 1 Km radius)	Surrounding area	Historical borehole (location accuracy 1Km buffer) located approximately within a 400m drilled in 1899 with a reported yield of 163.5m <sup>3</sup> /d	GSI Map Viewer (2022)	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 (2022)	Extremely high
GWDTEs	Proposed NHA Tarbert Bay	160m south of the site	NA	NPWS Online Resources (2022)	NA

### 4.7.3 Likely Main Effects on Environment

#### Do Nothing Scenario

In the absence of the Designated Development, there would be no resulting impacts on the water environment in the vicinity of the Site.

#### Construction Phase

The likely main construction effects in relation to water are described in Table 4.48. The table identifies the source of the impact; potential impact pathways (route by which receptors can become impacted) and potential effects arising from the potential impact. For each of the potential effects identified, the likelihood of an effect has been considered to determine whether an assessment should be undertaken. It is noted that the significance of effect is based on available information at the time of writing.

**Table 4-48: Potential Construction Effects**

Potential Impact	Potential Impact Pathway	Potential Effect	Significant Effect
Construction related activities in the superficial deposits	Mobilisation of contaminants/ existing elevated concentrations directly to the groundwater or alteration of superficial deposits groundwater flow regime	Pollution of bedrock groundwater or impact on the superficial deposits aquifer flow regime	<b>Significant.</b> Possible interaction of the site activities during the construction of the Designated Development within groundwater in the superficial deposits  Deepest excavation/ piling is unknown
Construction related activities in the bedrock aquifer	Mobilisation of existing contaminants directly to the groundwater or alteration of bedrock groundwater flow regime	Pollution of bedrock groundwater or impact on the bedrock aquifer flow regime	<b>Significant.</b> Possible interaction of the site activities during the construction of the Designated Development within the groundwater in bedrock aquifer  Deepest excavation/piling is unknown
Construction activities adjacent to River Shannon Estuary	Direct impact on any features of geomorphological interest	Damage or loss of features of geomorphological features of interest	<b>Significant.</b> Possible interaction of the site activities during the construction of the Designated Development and the water bodies surrounding the site
Temporary dewatering required for excavations/ piling	Altered local groundwater flow regimes, barrier to local flow	Reduced groundwater level and flow alteration and/or potential groundwater flood risks	<b>Significant.</b> Dewatering is anticipated to occur onsite during construction. However, there is no details on the specific nature of this
Accidental spills and leaks	Introducing contaminants to the water environment	Pollution of surface water and shallow groundwater	<b>Significant.</b> Possible interaction of the site runoff during the construction of the Designated Development and the water bodies surrounding the site

The likely main operational impacts on water receptors are described in Table 4.49.

**Table 4-49: Potential Operational Effects**

Potential Impact	Potential Impact Pathway	Potential Effect	Significant Effect
Increased water consumption and wastewater generation	Increased water consumption or introducing increased discharge to surface water	Increased pressure on water environment. Assume mains sewer is available	Not significant, no water usage or large increase in runoff anticipated
Accidental spills and leaks	Introducing contaminants to the subsurface	Pollution of surface water and groundwater	Significant. Possible interaction of the site runoff during the construction of the Designated Development and the water bodies surrounding the site

#### 4.7.4 Construction Phase - Mitigation Measures

Run-off into excavations / earthworks cannot be prevented entirely and is largely a function of prevailing weather conditions.

Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts. All run-off will be prevented from directly entering into any water bodies as no construction will be undertaken directly adjacent to open water.

During the construction phase water pollution may occur directly from spillages of polluting substances into waterbodies, or indirectly by being conveyed in runoff from hard standing, other sealed surfaces or from construction machinery. Fine sediment may also wash off working areas and hard standing (including approach roads) into waterbodies indirectly via existing drainage systems or overland flow. Due to the industrial activity of the Site, this sediment may potentially contain contamination that could be harmful to the aquatic environment.

It is expected minimal ground excavation will be required for this Designated Development and consequently should any dewatering be required during the construction phase this is expected to be minimal. Any water from dewatering activities would be tested and if uncontaminated would be discharged to the existing site drainage system. If contaminated the water would be tankered off Site for appropriate treatment and disposal.

There may also be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavation is kept relatively dry.

Measures to protect the water environment will be formulated in accordance with best practice guidance along with the specific measures detailed in section 4.6.4 – 4.6.8. The best practice guidelines are as follows:

- IFI (2016). *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*.
- CIRIA C741 *Environmental Good Practice on Site* (3rd edition) (C692).

- *CIRIA C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors.*
- CIRIA guidance documentation C648 'Control of Water Pollution from Linear Construction Projects'
- C609 (2004) Sustainable Drainage Systems, hydraulic, structural and water quality advice.
- British Standards Institute (2009) BS6031:2009 Code of Practice for Earth Works. British Standards Institute (2013) BS8582 Code of Practice for Surface Water Management of Development Sites.
- Sustainable Drainage Systems ("SuDS") constructed on the Site will be in accordance with The SuDS Manual (C753) (CIRIA, 2015) and the Site handbook for the construction of SuDS (C698) (CIRIA, 2007).

#### **4.7.4.1 Surface Water Management**

- The existing surface water management system, such as drains, settlement ponds, outfalls, and interceptors / separators, will be inspected and confirmed to be in suitable working order prior to any Designated Development works commencing on the Site.
- Additional new drainage installations will be installed in early stages of construction, which alongside the remaining existing drainage facilities, can be used to treat runoff for silt and hydrocarbons early on 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 Designated 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 Designated 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 operational phases. All surface water run-off within the Site will be directed to this drainage system.

#### **4.7.4.2 Sedimentation (Suspended Solids)**

During the construction phase, the mitigation measures will ensure that no sediment contamination, contaminated run-off, or untreated wastewater will enter water bodies on or near the Site. The following control measures will be implemented by the Contractor to manage silt-laden runoff into water bodies:

- Excavations will only remain open for the shortest possible time to reduce groundwater ingress. Silt traps will be placed around the Site to reduce silt loss, and these will be inspected and cleaned or replaced regularly.
- Run-off from spoil heaps will be prevented from entering water bodies by diverting it through settlement ponds and removing material off-site as soon as possible to designated storage areas.
- 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.
- Sediment barriers, such as silt fencing, will be used in areas where works are within 10m of water bodies. These barriers will be installed to directly treat surface water or direct surface water to the wider surface water management system. No existing riparian vegetation will be removed at any stage of the works.
- The extent of exposed ground will be minimised where possible and stockpiles covered so to reduce sediment supply and prevent the creation of any contaminated runoff. The potential will be further minimised by using grit traps to drain stockpile and wheel-wash areas so silt from these activities can be diverted to the drainage network. Straw bales and Terram will also be used at appropriate locations deemed to be at risk from silt pollution during construction works. In addition to these mitigation measures, general methods of good practice to keep the site tidy will be employed to minimise surface water contamination.
- Should short-term stockpiles be required these will be located at least 30m away from any water body. Slopes of these stockpiles will be made stable and regularly checked by the contractor or appointed staff member. Stockpiles shall be stored on impermeable surfaces and covered using tarpaulin.
- Surface water run-off from working areas will not be allowed to discharge directly to the River Shannon. To achieve this, the drainage system will be constructed prior to the commencement of major site works. 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*.
- To control erosion, areas of exposed ground and stockpiles will only be created when the area of the Site is to be worked upon. Stockpiles will be located 20m away from drains and water body where there is no sloped gradient. Stockpiles will be stabilised as soon as they are completed (e.g., seeded or geotextile mats), and bunded by earth or silt fences at the toe of the stockpile to intercept silt-laden runoff during rainfall events. Stockpiles will not be located where there is a steep slope towards a drain.
- Wash water with oils or chemicals will not enter any waterway by containing the wash water within a bunded and impermeable designated site and will be tankered off-site for authorised disposal.

#### 4.7.4.3 Fuel and Chemical Handling

It will be necessary to adopt the following mitigation measures at the Site, which will be implemented in full in order to prevent spillages to ground and drains of fuels, and to prevent any consequent surface water impacts.

- Designate a bunded storage area at the Contractor's compound(s) and at least 30m away from surface water gullies or drains for oils, solvents and paints used during construction. The fuel storage tanks shall be bunded to a volume of 110% of the capacity of the largest tank / container within the bunded area, away from any drains and / or water body. The Principal Contractor will allow for regular checks and maintenance as required.
- Drainage from the bunded area shall 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 shall 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 should be disposed of via a hazardous waste contractor.
- Where mobile fuel bowzers are used on the Site in the event of a machine requiring refuelling outside of the designated area, fuel will be transported in a mobile double skinned tank. Any flexible pipe, tap or valve must be fitted with a safety lock where it leaves the container and locked shut when not in use. Each bowser should carry a spill kit and each bowser operator must have spill response training. No refuelling will be allowed within 30m of a surface water body.
- Adequate stocks of hydrocarbon absorbent materials (e.g., spill-kits and / or booms) shall be held on-site in order to facilitate response to accidental spills. Spill response materials shall also be stored on all construction vehicles. It is important that the spill kits are regularly inspected and immediately replaced if used.
- 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 fuels and hazardous materials during the construction phase provides further potential for pollution incidents. Some removed topsoil and excavated material will be stored for reuse by the site, and it is important that these designated storage areas are strategically located in relation to the water bodies and any other drains, so that there is no risk of topsoil, or any other material being washed into the water bodies or drainage network.
- The storage of hazardous substances will be necessary during construction and a number of considerations will need to be made to reduce the potential for pollution from these sources.



Fuel will be required to be stored at least 30m from a water body and refuelling will only take place in designated areas, on hardstanding by appropriately trained personnel.

#### **4.7.4.4 Accidental Spillage, Flooding or Other Emergencies**

The Contractor will implement in full the prescribed measures identified below:

- 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.
- An Emergency Response Plan will be prepared by the appointed Contractor and included in the CEMP and construction workers trained to respond to spillages.
- A copy of the Emergency Response Plan 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 required 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 Emergency Response Plan 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.

#### **4.7.4.5 Concrete, cement, and grout**

- 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. Wash-outs will only be allowed to take place in designated areas with an impervious surface.

- Concrete will be used to construct the Designated Development and will therefore need to be managed to reduce the potential for pollution. The Principal Contractor will be required to 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.

#### **4.7.4.6 Monitoring**

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 30m from water bodies. 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.

A programme of water monitoring and controlled discharges of water abstracted from open excavations will be implemented. Where necessary, it is proposed that groundwater monitoring of existing boreholes (using boreholes installed as part of the Ground Investigation (GI) will be undertaken around the site in order to ensure the monitoring process is effective. Automatic water level data loggers (or other suitable method) to facilitate continuous monitoring will be installed in selected monitoring boreholes at strategic locations.

A project-specific Construction Environmental Management Plan (CEMP) will be prepared by the Contractors for the development in line with the Framework CEMP appended to this document (see Appendix B). The CEMP will cover all potentially polluting activities. All personnel working on the site will be trained in the implementation of the procedures. As a minimum, the CEMP for the Designated Development will be formulated in consideration of the standard best practice. The CEMP will include a range of site-specific measures.

#### **4.7.5 Operational Phase – Mitigation Measures**

During the operational phase of the Designated Development, there may be a need to provide treatment for potential contaminants so as to prevent adverse impacts upon surface water. However, there are no process effluent discharges from the Designated Development and material storage areas will be appropriately bunded so that the risk of contaminants entering the surface water will be negligible.

Surface water quality within the surrounding water bodies will be maintained by treating runoff prior to discharging to the water body. Runoff associated with the Designated Development will be passed through an oil interceptor prior to discharging into the existing clean water network. In the event of an incident, for example a spillage, firewater runoff will be retained on Site through kerbing, bunding and closure of drainage systems in accordance with the requirements of the IE Licence and COMAH.

#### **4.7.6 Residual Effects**

This high level assessment concludes that the likely main effect of the Designated Development Site upon any surface water environment in proximity would be 'Imperceptible' from surface activities subject

to the CEMP and the management of temporary drainage during construction. Although this assessment identified activities during construction and operation that have potential to generate temporary and local adverse impacts, when the proposed mitigation is considered, no significant effects are anticipated.

It is recognised that if piling is required to any significant depth, there could be a potential pathway created into the underlying groundwater. Any pollution risk associated with such a pathway would be prevented through a piling risk assessment to be prepared by the Contractor in advance of any piling works being undertaken.

#### 4.7.7 Limitations

The limitations of the above assessment are as follows:

- Where any conclusions and recommendations are outlined, they are based upon project design information available at the time of assessment. Site specific ground investigation work is ongoing for the Designated Development. Baseline receptors are derived from online publicly available information and the listed report sources only.

## 4.8 Climate

### 4.8.1 Introduction

#### Irish Policy and Legislation

As noted in Section 1.2 of this report, the '*Development (Emergency Electricity Generation) Act 2022*' ('the Act') has recently been enacted to provide for emergency measures for electricity generation development. Section 105 of the 2022 Act outlines the following in relation to climate: refers to the duty on public bodies that is contained in Section 15 of the Climate Action and Low Carbon Development Act 2015. Section 10 of the 2022 Act emphasises, in the context of Section 15 of the 2015 Act, the particular urgency and compelling necessity of the Designated Development. Section 10 of the 2022 Act provides as follows:

*Section 15 of Climate Action and Low Carbon Development Act 2015:*

*10. Taking into account the exceptional circumstances and the urgent and compelling necessity for securing the supply of electricity in the State, the Minister and the Board, in performing their functions under this Act, shall do so in a manner consistent with the plans, strategy, framework and objectives referred to in section 15(1) of the Climate Action and Low Carbon Development Act 2015 to the extent that they consider practicable, taking particular account of the said exceptional circumstances and urgent and compelling necessity.*

The Climate Action and Low Carbon Development Act 2015 sets out the long-term goal of Ireland achieving net-zero emissions by no later than 2050. In order to stay on course to achieve this target Ireland will need to achieve a 51% reduction in emissions by 2030 (relative to 2018 levels). The updated Climate Action Plan (CAP) 2023 outlines how Ireland will meet these targets, while keeping in line with the recently published economy-wide carbon budgets and sectoral emissions ceilings.

However, as mentioned in Section 1.2, since this legislation and policy was published there has been a great deal of uncertainty surrounding energy supply and security. As a result of these factors the 2022 Act was established to provide emergency measures for electricity generation development to ameliorate and protect security of supply of electricity in the State.

As stated in the CAP 2023 Government are responsible for ensuring critical services remain operational at all times, which as a result may require fossil fuel sources to provide back-up/emergency power when there is a temporary shortfall in energy supply. This is seen as only a short-term fix and as the Irish energy grid continues to decarbonise Ireland will still progress towards its target of net-zero emissions *by no later than 2050*.

*Chapter 12 in the Climate Action Plan 2023:*

*“Government set out its response to these challenges in the National Energy Security Framework, published in April 2022. This Framework details Government action to manage the impacts for energy users, ensuring continued security of supply, and reducing dependency on fossil fuels in the long term. It also highlights the work required in strengthening the grid to ensure a secure supply of electricity”.*

### Potential Climate Related Effects

This section assesses the potential climate-related effects of climate as a result of the Designated Development. There is the potential for a number of greenhouse gas (GHG) emissions to be released into the atmosphere during the demolition / construction, operational and decommissioning phases of the Designated Development.

In line with the international EU and Irish reporting obligations, GHGs will be reported as tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e) and consider the following seven gases:

- a) Carbon dioxide (CO<sub>2</sub>)
- b) Methane (CH<sub>4</sub>)
- c) Nitrous oxide (N<sub>2</sub>O)
- d) Sulphur hexafluoride (SF<sub>6</sub>)
- e) Hydrofluorocarbons (HFCs)
- f) Perfluorocarbons (PFCs)
- g) nitrogen trifluoride.

During the construction and decommissioning phases, GHG emissions can be caused by fuel used in construction vehicles, generators, and site equipment as well as embodied carbon in construction materials.

During the operational phase of the Designated Development, Site operational GHG emissions will be caused primarily by fuel combustion during energy generation.

Section 4.8.2 outlines the Site baseline GHG emissions, Section 4.8.3 outlines the potential impact the Designated Development will have on GHG emissions.

Section 4.8.4 outlines the mitigation measures that will be implemented to keep GHG emissions as low as possible.

During the construction, operational and decommissioning phases of the Designated Development, it is also important to note the impacts climate change will have on the development and identify what adaptation measures will be implemented to help mitigate any impacts.

**Section 4.8.2** outlines the climate baseline data or historic climate conditions and the projected climate data for the Site and surrounding environs. Based on the findings from the baseline data, **Section 4.8.3** outlines the potential effect these climatic conditions could have on the Designated Development. **Section 4.8.4** discusses a mix of adaptation measures that can be instated to reduce the Sites vulnerability to climate change during its lifecycle.

#### 4.8.2 Baseline Greenhouse Gases

As the Designated Development is being constructed on an industrial brown field site the baseline for greenhouse gas emissions is anticipated to be minimal and therefore not material. The greenhouse gas baseline is assumed to be zero as there is no preceding ecological value on the land and therefore no sequestration value. Prior to construction embodied carbon emissions would be zero as no activity took place on the site.

#### Climate Risk Baseline

In order to effectively use climate change projections for mitigating the effects of climate change on the Designated Development, it is necessary to understand the historic and future climate conditions experienced in the area. Table 4.50 outlines the historic climate change baseline for the period 1981-2000 and the future baseline using climate change projections under Representative Concentration Pathway (RCP) scenario RCP 4.5 and RCP 8.5. These climate predictions will help to understand what future climate conditions may impact the developments construction, operational and decommissioning phases. By understanding and pre-empting what climate impacts may affect the Designated Development we can look at adaptation measures that can be implemented to reduce the Designated Developments vulnerability to them. Section 4.8.4 will outline some short-term measures that can be instated to reduce the sites vulnerability to climate conditions for the duration of its lifecycle.

**Table 4-50: Climate Change Baseline & Projection Data**

Climate Variable	Historic Baseline (1981-2000) Shannon Airport Weather Station	Future baseline Climate change projection		Projected Source Trend	Source
		Moderate scenario RCP4.5 (2041- 2060)	Extreme scenario RCP8.5 (2041- 2060)		
<b>Temperature</b>					
Mean annual maximum daily temperature (°C)	14	1.1	1.4	↑	2
		15.1	15.4		

Climate Variable	Historic Baseline (1981-2000) Shannon Airport Weather Station	Future baseline Climate change projection		Projected Trend	Source
		Moderate scenario RCP4.5 (2041- 2060)	Extreme scenario RCP8.5 (2041- 2060)		
Mean annual minimum daily temperature (°C)	7.4	1.1 8.5	1.4 8.8	↑	2
Mean summer maximum daily temp (°C)	19.3	1.2 20.5	1.6 20.9	↑	2
Mean winter minimum daily temp (°C)	3.5	0.9 4.4	1.3 4.8	↑	2
Frost days per annum (days)	334	-52.3% 159.3	-63.8% 120.9	↓ ↓	2
Heatwaves (no.)	1	3.9	6.2	↑	2
Highest temperature for baseline period (°C)	30.6				1
Lowest temperature for baseline period (°C)	-8.2				1
<b>Rainfall</b>					
Mean annual rainfall levels (mm)	985.3	-1.5% 970.5	-1.0% 975.4	↓↑	2
Mean summer rainfall (mm)	214.8	-3.7% 206.9	-8.3% 197.0	↓	2
Mean winter rainfall (mm)	278.9	-0.40% 277.8	2% 284.8	↓↑	2
Wettest month on average (mm)	December				1
Driest month on average (mm)	April				1
Wet Days (>20mm) (%)	81	12.5% 91.1	21.8% 98.7	↑	2
Very Wet Days (>30mm)	15.0	20.7% 18.1	29.9% 19.5	↑	2
Summer dry days (5 consecutive days where daily precip <1mm)		19.9%	18.9%	↓	2
Highest daily rainfall (mm) for baseline period	44.3				1
<b>Other</b>					
Snowfall		-61.0%	-67.8%	↓	2
	9.2	-2.30%	-2.80%	↓	2

Climate Variable	Historic Baseline (1981-2000) Shannon Airport Weather Station	Future baseline Climate change projection		Projected Trend	Source
		Moderate scenario RCP4.5 (2041- 2060)	Extreme scenario RCP8.5 (2041- 2060)		
Mean wind speed (knot)		9.0	8.9		
Highest gust (knot)	83				1
Potential Evapotranspiration (mm)	1.6	2.7%	2.8%	↑	2
Sea level rise (m) *		0.2	0.2	↑	4
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 track of these storms may extend further south and over Ireland more often. Under RCP4.5, the projections of future intense storm tracks have a similar, but weaker signal.			↑	3

#### Projection Source

- 1 Met Eireann  
Historical Data <https://www.met.ie/climate/available-data/historical-data>
- 2 Climate Ireland <https://www.climateireland.ie/#!/tools/climateDataExplorer>
- 3 Environmental  
Protection Agency [https://www.epa.ie/publications/research/climate-change/EPA-159\\_Ensemble-of-regional-climate-model-projections-for-Ireland.pdf](https://www.epa.ie/publications/research/climate-change/EPA-159_Ensemble-of-regional-climate-model-projections-for-Ireland.pdf)
- 4 The World Bank  
Group <https://climateknowledgeportal.worldbank.org/country/ireland/impacts-sea-level-rise>

**Table 4-51: Climate Variables Definitions**

Climate Variables	Definitions
Summer dry days	Projected change number of dry periods defined as at least 5 consecutive days on which daily precipitation <1mm
Snowfall	Projected change (%) in the snowfall
Heatwaves	Periods of at least three consecutive days where maximum temperatures exceed >95% of the normal monthly distribution
Wet Days (>20mm)	Projected change (%) in number of days with rainfall >20mm
Very Wet Days (>30mm)	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 for the period 2040-2059.

#### 4.8.3 Likely Main Effects on Environment: Whole Lifecycle (Construction and Operational Phases)

##### Do Nothing Scenario

In the do nothing scenario, there will be no additional GHG emissions as a result of the Designated Development.

### Greenhouse Gas Emissions

As stated earlier there is potential for GHG emissions to be released into the atmosphere during the construction, operational and decommissioning phases of this Designated Development. Although the level of GHG emissions released during each phase of the Designated Development is dependent on a number of tentative factors, it's important to note that minimising unnecessary GHG emissions is a priority throughout each phase of the Designated Development.

The GHG emissions for the operational phase of the Designated Development have been calculated based on the assumption that the plant will only run for a maximum of 500 hours per annum. The total capacity of the plant is 150MW, comprising of three 50MW LM6000 gas turbines. When run for 500 hours per calendar year, there will be a total annual generation of 75,000MWh. Assuming the manufacturer's stated efficiency of 41.4%<sup>49</sup> for the LM6000 engine, this output will require a fuel energy input of 181,159MWh per year.

Applying standard emissions factors for 100% mineral diesel (assumed to be the equivalent of distillate fuel for carbon accounting purposes)<sup>50</sup> the consumption of this amount of fuel will result in direct Scope 1 emissions of 48,803 tonnes CO<sub>2</sub>e/year. There will also be indirect Scope 3 emissions of 11,348 tonnes CO<sub>2</sub>e from the upstream fuel supply chain; these are also known as Well to Tank (WTT) emissions. Total annual emissions are 60,150 tonnes CO<sub>2</sub>e.

As stated in Section 1.4 the Designated Development was commissioned as the Government identified the potential for a shortfall in electricity supply during periods of peak demand, should these periods coincide with low renewable and interconnector availability. This is not contradictory to the target of achieving net-zero emissions by no later than 2050 as this is seen only as a short-term measure to allow for the grid to decarbonise and increase capacity, and as a result the long-term goal of net zero remains.

GHG mitigation measures will be implemented at all stages of the Designated Development, and these are outlined in Section 4.8.4. No mitigation measures are considered to be required for the construction of the Designated Development but in accordance with best practice, the contractor will seek to adopt low carbon solutions during its design and construction, recognising that the extent of construction and use of concrete is expected to be limited.

### Climate Risk

Table 4.50 outlines the expected trends, relative to the baseline period 1981-2000, and the predicted climatic conditions for the area where the Designated Development will be built. However, due to the nature of the Designated Development being a short term and temporary development, the trends outlined in Table 4.50 may be less severe.

Looking at the general predicted climatic trends for Ireland and the trends predicted in Table 4.50 a number of climate risks were identified that may impact the Designated Development. Ireland is

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<sup>49</sup> <https://www.ge.com/gas-power/products/gas-turbines/lm6000>

<sup>50</sup> <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022>



predicted to experience an increase in the severity and frequency of storms and an increase in the annual average temperature<sup>51</sup>, with 2022 being the warmest year recorded since 1900.<sup>52</sup> Ireland is also set to experience changes in the frequency and intensity of precipitation. Summer and Autumn months are predicted to be drier, while winters are expected to experience an increase in heavy precipitation events.<sup>53</sup>

Based on these predictions and given the Designated Developments location the following climate risks were identified:

- Pluvial, fluvial, coastal and groundwater flooding.
- Extreme weather conditions during storms e.g., high winds and storm surges
- Increased temperatures
  - Section 4.8.4 will outline a number of measures that can be taken to reduce these climate risks.

#### **4.8.4 Mitigation and Adaptation Measures: Whole Lifecycle (Construction and Operational Phases)**

##### **4.8.4.1 Greenhouse Gas Emissions Mitigation Measures**

The Framework CEMP will act as an overarching document that will lay out a number of measures to be taken to limit greenhouse gas emissions and keep the Designated Development in line with industry best practice standards. Where applicable carbon mitigation measures will be secured through the CEMP.

The following list states a number of measures that will be integrated into the construction, operational and decommissioning phases of the Site, to help minimise greenhouse gas emissions being generated.

- When sourcing materials for the Designated Development first choice will be given to locally sourced materials.
- Any existing materials already on the Site will be considered for reuse in the Designated Development, where feasible.
- When possible, machinery, vehicles and energy will all use low and zero carbon energy e.g., electric vehicles and solar powered pitch lights
- Workers will also be trained and informed of the ways in which they can reduce their energy use and avoid unnecessary energy consumption onsite e.g., avoid leaving equipment on standby and turn of lighting when not in use
- Reduce potential emissions by minimise the waiting time for loading and unloading materials, efficiently handling materials on site.
- Undertaking regular maintenance of plant and machinery

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<sup>51</sup> Environmental Protection Agency [https://www.epa.ie/publications/research/climate-change/EPA-159\\_Ensemble-of-regional-climate-model-projections-for-Ireland.pdf](https://www.epa.ie/publications/research/climate-change/EPA-159_Ensemble-of-regional-climate-model-projections-for-Ireland.pdf)

<sup>52</sup> Met Eireann <https://www.met.ie/2022-provisionally-irelands-warmest-year-on-record#:~:text=Provisionally%2C%202022%20was%20the%20warmest,year%20on%20record%20for%20Ireland.>

<sup>53</sup> Environmental Protection Agency [https://www.epa.ie/publications/research/climate-change/EPA-159\\_Ensemble-of-regional-climate-model-projections-for-Ireland.pdf](https://www.epa.ie/publications/research/climate-change/EPA-159_Ensemble-of-regional-climate-model-projections-for-Ireland.pdf)

- When materials are being cleared from the Site, thought will be put into how best they can be disposed of e.g., recycling and reuse of 'waste' materials will be emphasised, and landfill seen as a last resource.

#### 4.8.4.2 Climate Change 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 Actions** - 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.

The following list states a number of measures that will be integrated into the construction, operational and decommissioning phases of the Site, to help reduce the effects of climate change and extreme weather events on the Designated Development.

- As the site is located beside the Shannon Estuary consideration will be given to temporary flood prevention measures, as any overflow of the Estuary during a period of extreme rainfall could cause disruption and possible damage to the development.
- Consideration will be given to a storm water management plan in the case that onsite flooding occurs, as a result of pluvial flooding, coastal flooding, and fluvial flooding.
- Given the coastal location of the development consideration will be given to temporary flood prevention measures, as increase sea levels and storm surges could cause disruption and possible damage to the development, as well as harm to those working on it.
- An energy strategy will be integrated to the construction phase of the plan to ensure that the site is not heavily reliant on energy and electrical services that are prone to failure during extreme weather events, particularly those that would be needed in an emergency. E.g., Flood lights
- Preference will be given to construction materials that are more resilient to the identified impacts of climate change.
- The Contractor will monitor weather forecasts and plan works accordingly, protecting workers and resources from any extreme weather conditions.
- Consideration will be given to suitable storage and bunding of any pollutants to protect from high rainfall events.

- Omit any topographic low points and install drainage if required to mitigate the risk of surface water flooding
- Critical equipment to be raised above estimated peak flood level (e.g., electrical equipment).
- Minimise maintenance during extreme weather events e.g., high wind events.
- Maintenance of the drainage system to be included within the general site management.

#### 4.8.5 Residual Effects

Following the implementation of the recommended GHG emission mitigation measures and climate change adaptation measures the level of the unnecessary GHG emissions emitted during the Designated Development lifecycle will be minimal and the risk posed by extreme weather events caused by climate change, will be lessened.

## 4.9 Material Assets

### 4.9.1 Introduction

This section of the report assesses the likely main effects of the Designated Development on material assets (built services).

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)<sup>54</sup>.

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.*

The study area is the Site, as well as the surrounding area (within 200m) in relation to land use and utilities network that could be impacted by the Designated Development. This study area has been selected due to the existing environment of the Site.

Effects arising from decommissioning of the Designated Development are of a similar or lesser nature and duration to those arising from the construction process and therefore have not been considered separately. Where this assessment refers to potential construction effects, these are also representative of predicted decommissioning effects.

### 4.9.2 Baseline

#### Land Use

Tarbert Power Station is located on the southern shore of the Shannon Estuary, on Tarbert Island and has been producing electricity since the 1960's. The Site located on an island, comprises industrial and

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<sup>54</sup> EPA (2022).

brownfield lands which are recognisant of the sites long established industrial activity. Access to the Site is via the N67.

The Site has structures, plant, storage areas, the power station – including stacks, four generating units, treatment areas and a range of ancillary services associated with the operational Tarbert Power Station. The established character and use of the Site is industrial, reflecting its long established use for power generation activity.

The Site is located 1.8km north of the village of Tarbert, and in an area zoned for industrial development. The areas surrounding the Site is agricultural.

### **Electricity Supply**

The Tarbert Power Station Site is connected to the national grid via a 220kV substation. Lower voltage supplies are available on the Site from the 110kV substation.

### **Surface Water**

The existing surface water drainage network collects runoff from building roofs, hardstanding / paved areas and discharges from bunds and storage tanks. Drainage arising from paved road surfaces and buildings, such as the boiler house and turbine house, are conveyed to the existing surface water drainage network on-site prior to discharging into the Shannon Estuary.

The extensive drainage network incorporates interceptors and a suspended solids settlement pond prior to discharging to the Shannon Estuary. There are no designated attenuation storage systems or flow control devices associated with the existing development.

### **Foul Water**

The existing Tarbert Power Station has a foul Water Treatment Plant (WTP) which is used in the treatment of domestic foul water discharged from the Site. The existing foul WTP plant will be retained and tied into as part of the Designated Development.

### **Telecommunications**

There are existing telecommunication lines for telephone and fibre services at the Tarbert Power Station Site. There are underground carrier ducts existing within the Site.

## **4.9.3 Likely Main Effects on Environment**

### **Do Nothing Scenario**

In the absence of the Designated Development, no significant changes to material assets, are anticipated. There would be no impact with regard to the upgrade and / or connection of utilities proposed as part of the Designated Development.

#### **4.9.3.1 Construction Phase Land Use**

The land use on the Site is industrial, as it is associated with Tarbert Power Station. There will be no effects associated with the change of land use.

The main Site access for construction phase traffic will be available via existing retained entrances from the N67. Direct access to the Site will be via two entrances off the N67 and the existing internal

roadways. Traffic controls will be used to and from the Site as required and will consist of an allocated member of the construction team. It is anticipated that the significance of impact without mitigation will be Imperceptible.

### **Power and Electrical Supply**

The construction compounds and laydown areas will be located entirely within the Site. During the construction phase the Contractor will require power for onsite accommodation, and construction equipment/plant.

It is anticipated that the power requirements during the construction phase will be minor, and the significance of impact without mitigation will be Imperceptible.

Any excavations within the vicinity of existing electrical services will be carried out in consultation with SSE to ensure there is no impact on existing users. It is not anticipated that there will be any impact or disruptions to the national grid during Site works.

All utilities work shall be carried out in accordance with the relevant requirements of the respective service providers.

### **Surface Water**

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. 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.

During the construction phase, there is a risk of accidental pollution incidences from spillage or leakage of oils and fuels stored on-site or refuelling on-site and the spillage or leakage of oils and fuels from construction machinery. For the duration of the construction phase, mobile plant will be returned to a secure overnight plant storage area on the Site, at the end of each shift. Drip trays will be utilised under the various types of plant.

Storage areas will be provided for flammable/toxic/corrosive materials, in a separate location that will be locked, impermeable bunded and fenced off. Material data sheets will be used for all these materials.

Section 4.7.3 of this report outlines the potential construction effects in relation to surface water.

### **Foul Water**

Welfare facilities will be provided by the Contractor on-site during the construction phase. Foul water from welfare facilities during the construction phase will be collected and periodically removed from the Site by road tanker. As this control measure will be incorporated into the Site set-up, there will not be an impact.

### **Water Supply Network**

During the construction phase, water supply will be provided for by the Irish Water public watermain which will be retained. Water will be used by the following during the construction phase:

- potable water for general purposes - drinking water, toilets etc.; and
- water for fire-fighting purposes.

The water supply arrangements will be carried out to the requirements of Irish Water.

The number of construction workers required during the construction phase is expected to peak at approximately 200 persons.

There is sufficient capacity in the water supply network to facilitate the construction works, therefore it is anticipated that the potential water supply impacts will be *temporary* and *imperceptible*.

### Telecommunications

The exact location of existing telecommunications services (underground/overhead) will be confirmed prior to the commencement of construction works. It is anticipated that the potential impacts will be *temporary* and *imperceptible*.

#### 4.9.3.2 Operational Phase Land Use

The land use on the Site is industrial, as it is associated with the Tarbert Power Station. There will be no effects associated with the change of land use during the operational phase. Therefore, there are no effects associated with the change of land use or access during the operational phase of the Designated Development.

### Power and Electrical Supply

The three gas turbine generator units will be connected to one of the two Generator Step-up Transformers (GSUT), 110 kV, which will export to the grid through cable connection to a bay at the existing 110 kV substation, located within the Tarbert Power Station Site. The significance of impact without mitigation is *not anticipated to be significant*.

### Surface Water

During the operational phase, the following potential surface water impacts may occur:

- Pollution of surface waters from accidental spills and leaks of fuels and chemicals.

Distillate fuel storage and preparation for use have the potential to release hydrocarbon contamination to the surface water system and into the catchment area. Contamination may also arise from transformer oil and from chemicals stored on site.

During the operational phase therefore, there is a risk of accidental pollution incidences from spillage or leakage of oils and fuels stored on-site.

Diesel oil will be stored in double wall tanks and in steel tanks located in a concrete bund. Electrical transformers will be located in a bund and chemicals will be stored in bunded containers.

Storage areas will be provided for flammable/toxic/corrosive materials, in a separate location that will be locked, impermeable bunded and fenced off. Material data sheets will be used for all these materials. The significance of impact without mitigation it not anticipated to be significant.

### Foul Water

The existing Tarbert Power Station has a foul Water Treatment Plant (WTP) which is used in the treatment of domestic foul water discharged from the power station. The Designated Development will

tie into the existing foul WTP. During the operational phase there will be a slight increase to the volume of wastewater due to the temporary increase in staff numbers associated with the operational phase of the project. It is anticipated that the significance of impact will be negligible.

### **Water Supply Network**

Water supply will be provided from the existing connection to Irish Water public watermain. Potable water will be used for general purposes i.e., drinking water, toilets etc.

The water supply arrangements will be carried out to the requirements of Irish Water.

Water for the purposes of firewater/storage will be sourced from the existing reservoir to the east of the Site. The firewater storage tank will have a capacity of approximately 2500m<sup>3</sup> in volume and will be used by the fire water system and for non-potable general domestic supplies. Refer to Section 2.3.5. The significance of impact without mitigation is not anticipated to be significant.

### **Telecommunications**

Existing telecommunications connections to the Tarbert Power Station include an Eir telephone cable connection and fibre optic system on the Site. In addition, mobile phone communication will be used. It is anticipated that all systems will be used during the operational phase. The significance of impact without mitigation will be Imperceptible.

### **Telecommunications**

There are existing telecommunication lines for telephone and fibre services at the Tarbert Power Station Site. There are existing underground carrier ducts existing within the Site.

#### **4.9.4 Construction Phase – Mitigation Measures**

The following measures will be implemented during the construction phase:

- Construction works will be carried out in such a way as to prevent, contain, or limit, as far as reasonably practicable, any adverse effects arising from the presence of contaminated land or materials (if encountered).
- 'Clean' and 'dirty' (contaminated) work areas will be divided by internal fencing where any contamination is encountered.
- Appropriate Personal Protective Equipment (PPE) will be worn by ground workers and other staff.
- Those potentially at risk will be made aware of potential hazards via site safety induction procedures.
- Leaks and spills will be prevented, and control measures (outlined in Section 4.7) used to prevent contaminants entering the sub-surface or groundwater environment.
- Material removed as part of the construction will be re-used elsewhere in the project where practicable and possible.
- Any soil/overburden encountered will be separated where removal is required and will be conserved and stored in a designated area and appropriately protected, ready for re-use as fill for the project.

- Contaminated materials will be assessed as either: solids; liquids; gas; and leachate to allow for appropriate management.
- The measures outlined in Section 4.7 will be implemented to prevent the contamination of ground and surface watercourses during the works.
- Hazardous dust emissions will be prevented during excavation, or from stockpiles by implementing the measures outlined in Section 4.2.
- The Contractor has a duty under the *Safety, Health, and Welfare at Work (Construction) Regulations 2013* to protect their employees against hazardous substances encountered at work. To that end and in accordance with CIRIA guidance (R132) *A guide for safe working on contaminated sites (1996)*, the Contractor will be required to undertake a risk assessment before any work is carried out at the site which is likely to expose staff to substances hazardous to health. Should hazards be identified during additional site investigation, the Contractor will be required to ensure that all employees (construction workers) are issued with personal protective equipment (PPE) appropriate to the hazards identified. PPE will, as required, consist of hazard specific gloves, eye protection and respiratory protective equipment (RPE).

#### 4.9.5 Operational Phase – Mitigation Measures

There will be no requirement for additional mitigation measures during the operational phase.

Operational procedures will be in place that will clearly outline responsibilities 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 Environment Management System (EMS) and regulated by EPA through the IE Licence.

Water supply arrangements will be carried out to the requirements of Irish Water.

#### 4.9.6 Residual Effects

Following the implementation of these mitigation measures and the measures in the Framework CEMP (refer to **Appendix B**), it is unlikely that there will be any residual effects on material assets during the construction and operational phases of the Designated Development.

## 4.10 Cultural Heritage

### 4.10.1 Introduction

This section provides information in relation to the likely main effects of the Designated Development on Cultural Heritage from the construction and operational phases of the project.

Effects arising from the decommissioning phase of the Designated Development are of a similar or lesser nature and duration to those arising from the construction phase and therefore have not been considered separately in this document. Where this assessment refers to likely construction effects, these are also representative of predicted decommissioning effects.



## 4.10.2 Methodology

The Designated Development otherwise known as the 'Site' is located within a brownfield site and industrial setting which has been previously disturbed by works.

For the purpose of this baseline report, cultural heritage assets have been identified in the Sites and Monuments Record (SMR) of the National Monument Service (NMS), the National Inventory of Architectural Heritage (NIAH) and the Record of Protected Structures (RPS) maintained by the local authorities in Cos. Kerry, Limerick and Clare.

Non-designated archaeological sites comprise the majority of archaeological sites recorded in the SMR, as well as architectural sites and gardens in the National Inventory of Architectural Heritage.

Designated cultural heritage assets comprise archaeological sites designated as National Monuments, architectural sites as Protected Structures, and locales designated as Architectural Conservation Areas.

A number of non-designated and designated cultural heritage sites were identified within a 1km study area from the Red Line Boundary (RLB) of the Site.

Designated cultural heritage sites have been identified within a 3km study area from the RLB of the Site. This study area has been selected due to the existing conditions on site and technical expertise.

The search for cultural heritage assets was undertaken using the NMS Historic Environment Viewer map facility (<http://webgis.archaeology.ie/historicenvironment/>) and the Heritage Council's Map Viewer (<https://www.heritagemaps.ie/WebApps/HeritageMaps/index.html>)

The Records of Protected Sources were accessed using the following links.

- For Co. Kerry: <https://kerry.maps.arcgis.com/apps/webappviewer/index.html?id=33565bc13600476c8c4bae1eadb8c22d>
- For Co. Limerick: <https://maps.limerick.ie/planningenquiry>
- For Co. Clare: <https://www.clarecoco.ie/services/planning/conservation/protected-structures/>

## 4.10.3 Baseline

### 4.10.3.1 Non-designated and Designated Cultural Heritage Assets within 1km Study Area

There are no designated or non-designated cultural heritage sites located within the Red Line Boundary (RLB) of the Site itself.

There are two non-designated historic military sites located outside the RLB but in **close vicinity** of the Site. The archaeological remains of a 17<sup>th</sup>-century bastioned fort (KE003-001) are situated 200m to the south-west, and the site of a 19<sup>th</sup>-century military battery (KE003-002) is located 300m to the east (now demolished following construction of the Tarbert Power Station).

Tarbert Lighthouse, a Protected Structure (RPS-KY-0891), is situated 500m to the north-east.

Another Protected Structure, Tarbert House (NIAH 21300310 & RPS-KY-0884), is a country residence set within woodland and parkland, and is located 1km to the south. The woodland and parkland of

Tarbert Demesne is non-designated (NIAH Garden No. 2051) and is situated 400m to the south of the RLB of the Site.

#### **4.10.3.2 Designated Cultural Heritage Assets within 3km Study Area**

Within the wider 3km study area, there are a number of archaeological sites, which mostly comprise early medieval ringforts, some of which are provided with souterrains. There are a number of holy wells and a church site, all probably of early medieval origin. There is a moated site either later medieval or 17<sup>th</sup>-century in date. While these sites are recorded on the SMR, they are not designated National Monuments.

2km south of the Designated Development lies the village of Tarbert, which contains a number of buildings of architectural significance recorded by the National Inventory of Architectural Heritage, and which are also designated as Protected Structures by KCC. Testimony to the importance of the local economy to the area are the remains of a creamery (NIAH 21300307 & RPS-KY-0883) and an industrial building (NIAH 21300308 & RPS-KY-0878).

Institutional buildings are also to be found in Tarbert. There is a former courthouse and bridewell (NIAH 21300306 & RPS-KY-0882), along with St. Mary's Catholic church and presbytery (NIAH 21300304 & RPS-KY-0886; NIAH 21300303 & RPS-KY-0885) and St Brendan's Anglican church (NIAH 21300305 & RPS-KY-0887).

There are a small number of town houses that are also recognised as being of architectural significance – there are three co-joined buildings on Bridewell Street – Coolahan Public House (NIAH 21300309; RPS-KY-0879), a former betting office (RPS-KY-0880) and what was formerly Enright's Restaurant (RPS-KY-0881).

In addition, there are three Architectural Conservation Areas (ACAs) – three small blocks on Church Street and Listowel Road in Tarbert.

Outside of Tarbert, and 2km south-east of the RLB of the Site is Ballydonohoe House (NIAH 21901701). This house is also regarded as having architectural significance and is a Protected Structure (RPS no. 83). Its woodland and gardens are non-designated assets (NIAH Garden No. 1350). 2.6km to the south-east of the RLB, in the same townland, close to the foreshore of the Shannon Estuary is a limekiln known as 'Mr Bunce's Kiln' which is also a Protected Structure (RPS no. 82)

North-east of the Site, across the Shannon Estuary in Co. Clare, there is a 19<sup>th</sup>-century battery (CL068-046, NIAH 20406805 & RPS no. 345) at Kilkerin Point in the townland of Lakyle North.

3km north-west of the RLB of the Site is Besborough House, a Protected Structure (RPS No. 483), in the townland of Carrowdotia South. Its woodland is a non-designated asset (NIAH Garden No. 3698).

#### **4.10.4 Likely Main Effects on Environment**

##### **Do Nothing Scenario**

The 'do nothing' scenario would not result in any significant changes to the baseline cultural heritage reported in section 4.10.3.

#### 4.10.4.1 Construction Phase

There is one recorded heritage asset recorded within the boundaries of the Tarbert Power Station Site. This is the former Tarbert Island Battery (KE003-002) which has been completely built over by the Power Station. This asset will not be impacted by the Designated Development. The remains of a bastioned fort (KE003-001) are located to the south of the Designated Development. These have been impacted by previous works associated with the Power Station with the fort badly denuded and now overgrown. Neither asset will be impacted by the Designated Development.

The Designated Development concerns the placement of three emergency generating units within the Tarbert Power Station Site. The Power Station has been upgraded since it was constructed with groundworks carried out. These groundworks will have impacted any unrecorded heritage assets which may have existed. Given these conditions, there will be no physical impact to unrecorded heritage assets during the construction phase.

Groundworks associated with the Designated Development will introduce noise, dust, and vibration to the study area while the physical presence of the three emergency generating units with their 30m high emissions stacks will create a visual element against the existing skyline. These could impact the settings of heritage assets especially the Protected Structures.

The majority of the Protected Structures / heritage assets are located within Tarbert which is a small settlement located 1.8km to the south. The settings of the Protected Structures / heritage assets are already subject to noise, dust, and vibration from passing traffic travelling through Tarbert. Noise, dust, and vibration arising from groundworks will not affect the ability to understand or appreciate the Protected Structures / heritage assets and will be limited to the construction phases.

There are no direct views between the Protected Structures / heritage assets within Tarbert and the Designated Development. Therefore, the presence of the three emergency generating units will not create a visual impact upon the settings of these assets. There will be no impact.

#### 4.10.4.2 Operational Phase

Significant effects for the operation of the Designated Development derive from changes to the setting of heritage assets. As the impacts to the setting of designated assets within the wider study area will be the same as for the permanent construction of the Designated Development, these are not restated here. The significance of effects for the operation of the Designated Development on heritage assets will therefore be the same as determined for the Construction Phase on those individual assets. No impacts will be experienced at construction phase, and this will continue during the operation phase.

#### 4.10.5 Construction Phase – Mitigation Measures

For the reasons set out in the previous section, no archaeological mitigation is required during the construction phase.

If unexpected archaeological remains or artefacts are discovered during construction work, work in that area will cease and the area will be protected. The Archaeological Consultant and National Monuments Service (NMS) will be notified, and an unexpected find protocol will be implemented as outlined below:

- All archaeological works (which will be agreed by the Archaeological Consultant and NMS) will be carried out in compliance with the National Monuments Acts 1930 – 2004 (and *Policy and*

*Guidelines on Archaeological Excavation* (Department of Arts, Heritage Gaeltacht, and the Islands, 1999);

- A suitably qualified and licensed Archaeological contractor will be appointed to carry out the archaeological fieldwork;
- Relevant licenses will be acquired from the NMS for all archaeological works, which will be carried out in accordance with an over-arching Method Statement for Archaeological Works prepared by the Archaeological Consultant and agreed with the NMS.

#### **4.10.6 Operational Phase – Mitigation Measures**

Appropriate measures will have been implemented at construction phase to identify and reduce adverse effects on unrecorded heritage assets. No further mitigation is proposed with respect to heritage assets for the operational phase of the Designated Development.

#### **4.10.7 Residual Effects**

The section described the resultant residual significance of effects on cultural heritage assets following mitigation in relation to the Designated Development. This assessment has identified that there will be no effects to heritage assets. No mitigation is required and there are no residual effects.

## **4.11 Landscape and Visual**

### **4.11.1 Introduction**

This section presents a landscape and visual overview of a Designated Development to be located within the grounds of the existing Tarbert Power Station Site, Tarbert, Co. Kerry. The Site is located on Tarbert Island, a small headland in the Shannon Estuary. The boundary with Co. Clare is located in close proximity north, along the centre line of the Shannon estuary. The boundary with Co. Limerick is located in close proximity to the southeast of the Site, and also within the Shannon estuary.

The available area for the Designated Development measures approximately 13.55ha and is in a brownfield condition. The overall landholding, of approximately 42ha, is occupied by the existing electricity generating, transmission and fuel storage infrastructure of Tarbert Power Station.

Effects arising from the decommissioning phase of the Designated Development are of a similar or lesser landscape and visual effects and duration to those arising from the construction phase and therefore have not been considered separately in this document. Where this assessment refers to likely construction effects, these are also representative of predicted decommissioning effects.

### **4.11.2 Baseline**

The Site is accessed from the N67, which terminates to the east of the existing Power Station lands at the Tarbert Ferry crossing point (Tarbert – Killimer Car Ferry), connecting counties Clare and Kerry. The landscape to the south of the Site 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 east of the Site. The village of Tarbert is the main centre of population in the area and located approximately 1.8km to the south of

the Site, 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 features in the area, approximately 2.5km wide at this point and identified as a SPA under the Wild Birds Directive and the Lower River Shannon Special Area of Conservation (SAC). Tarbert Bay Protected Site is pNHA under the Wildlife (Amendment) Act 2000.

In terms of Marine Related Industry, the Tarbert-Ballylongford Land Bank, Co. Kerry has been considered as an area of interest for a wide range of small scale commercial to major commercial and industrial developments, this area is designated as a strategic zone for development. The Shannon Estuary is subject to the Strategic Integrated Framework Plan (SIFP), the framework plan provides a range of guidance including guiding principles, objectives, and mitigation measures for development in this zone.

Across the estuary to the north, the Clare County Development Plan (current and draft) designates the area around Clonderalaw Bay as a Heritage Landscape 3: The Fergus / Shannon Estuary– “*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 passes in close proximity to the Designated Development Site along the N69. The N69 to the east is identified as a scenic route in the current Kerry County Development Plan 2022-2028. The existing Tarbert Power Station when combined with the existing Moneypoint Power Station at the northern shore of the Shannon estuary forms a significant cluster of industrial power plant infrastructure along the estuary.

#### **4.11.2.1 Landscape Character**

Landscape effects describe the impact on the fabric or structure of a landscape or landscape character. In this case, the landscape character also includes seascape character considering the location along the Shannon Estuary.

The Designated Development Site is located on the northern tip of Co. Kerry and on the cusp of three county jurisdiction's, including Co. Clare to the north and Co. Limerick to the east. The location of the Site on the edge of the southern shore of the Shannon estuary results in it being particularly visible in scenic views from the northern shore of the estuary; from the open waters views along the estuary, from Clonderalaw Bay, the N67/Coast Road and from sections of the N69/Coast Road along the southern shore of the Shannon Estuary extending east to beyond Glin, Co. Limerick.

#### **Kerry County Development Plan 2015–2021 extended to 28<sup>th</sup> Nov 2022 and Draft Kerry County Development Plan 2022–2028**

The Kerry County Development Plan 2015–2021 Objective (ZL-2) states to prepare a Landscape Character Assessment in order to provide information, objectives, and policies of relevance to the landscape character areas and visual environment. While the draft Kerry County Development Plan 2022–2028 (KCDP) has yet to be formally adopted, a detailed Landscape Character Assessment has been prepared for Co. Kerry - documented in Appendix 7, The Landscape Review, including Landscape values, landscape sensitivity and scenic views and prospects have been produced, and are considered pertinent to report.

## Views and Prospects

The lands to the south of Site include areas of visual amenity and are considered a 'visually sensitive area'. Views and Prospects from the N67/coast road on the eastern side of the Site, facing east and north afford open vistas across the Shannon Estuary and are orientated away from the Designated Development. The location of these designations is indicated in Plate 4.10.

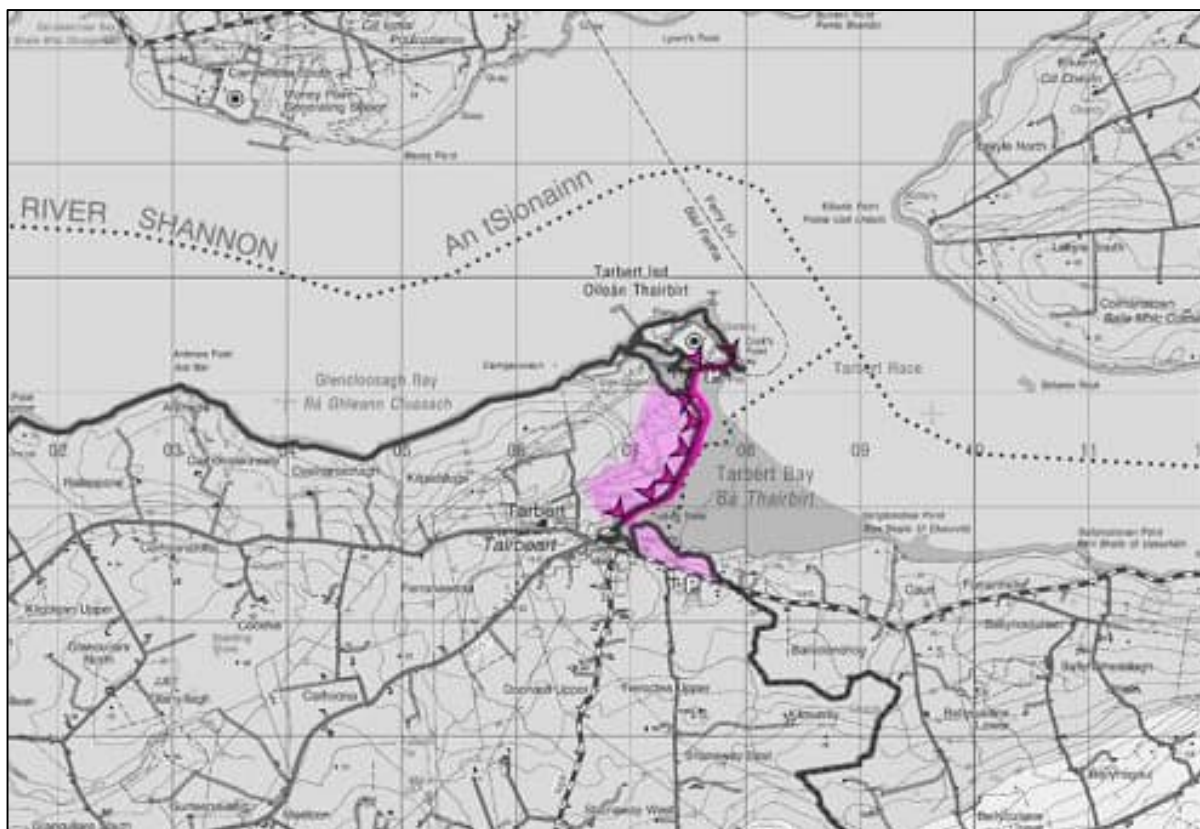


Plate 4:10: Localised Views and Prospects<sup>55</sup>

## Landscape Character

The Landscape Review (refer to Appendix 7 in the Draft Kerry County Development Plan 2022-2028) subdivides the county into landscape types and landscape character areas. The Designated 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. This area currently has no landscape designation.

The Landscape Review also identifies 40 landscape character areas. The Designated Development is located within Landscape Character Area (LCA) 2 – The Shannon Estuary.

## Visual Sensitivity

The Landscape Review also identifies visual sensitivity. LCA 2 – The Shannon Estuary has been classified as Medium/High.

<sup>55</sup> Draft Kerry County Development Plan 2022-2028, Visually Sensitive Areas and Views & Prospects Map A (extract)

## Landscape Sensitivity

The Landscape Review evaluates the sensitivity of a number of landscape components in order to determine an overall landscape sensitivity of the LCA. These components include context, scale, landform, landcover, built environment, perceptual qualities, visual amenity, and landscape value.

The overall landscape sensitivity of LCA 2 –The Shannon Estuary is classified as Medium/High.

### 4.11.2.2 Clare County Development Plan 2017-2023 (draft CCDP 2023 – 2029)

Clare County Development Plan (CCDP) is the primary policy document for planning policy throughout the functional area of Clare County Council. The CCDP has regard to other relevant local policy documents. The objectives contained in the County Development Plan complement the goals and aims of the Clare Local Economic and Community Plan 2016-2021, the Climate Change Adaptation Strategy 2019-2024, and the Clare County Council Corporate Plan. The CCDP provides information, objectives, and policies of relevance to the landscape and visual environment for the areas on the north bank of the River Estuary.

CCDP and the associated Landscape Character Assessment includes details on Seascape Character Areas (SCA) along the shores of Co. Clare. The Seascape Character Assessment indicates the location of relevant seascape character areas located within the study area: *'The Lower Shannon SCA is situated between Kilcredaun Point and Lynchs Point (east of Money Point)'*.

### Seascape Condition and Sensitivity County Clare

*"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 County Kerry and Limerick. Changes would be evident due to low lying and exposed nature of the area".*

### Views and Prospects County Clare

Views of high amenity value are identified along Designated Scenic Routes throughout the County. It is not proposed that this should give rise to the prohibition of development along these routes but development, where permitted, *"should not seriously hinder or obstruct these views and should be designed and located to minimise their visual impact"* (CCDP).

It is an objective of Clare County Council:

*"a) To require that it be demonstrated that every effort has been made to visually integrate any proposed development within a Seascape Character area. This must be demonstrated by assessing the proposal in relation to:*

- *Views from land to sea;*
- *Views from sea to land;*
- *Views along the coastline".*

A number of Views and Prospects, are located along identified scenic routes, interwoven with designated heritage landscapes. The N67 – Killimer Road northwest of the Designated Development loops around Ballymacrinan Bay and north of Moneypoint as indicated in Plate 4.11.

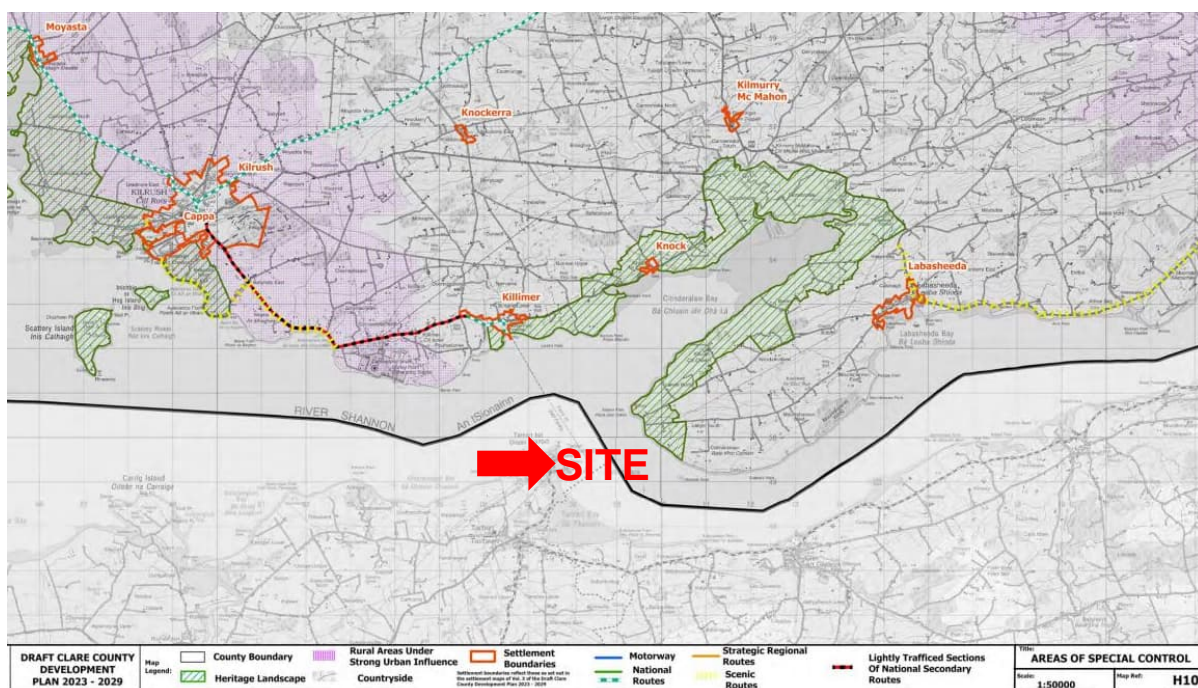


Plate 4.11: Scenic routes and Heritage Landscape designation north of the Designated Development<sup>56</sup>

### Landscape Value

The Landscape Character Assessment of County Clare 2004 (CLCA) divides the county into 21 separate Landscape Character Areas (LCA's). LCA No.18: Shannon Estuary Farmland stretches along the north bank of the River Shannon Estuary. The LCAs is described as being of variable condition where “*Moneypoint power station is a singularly large scale detractor on the Shannon, accompanied by a number of prominent pylons*”. The CLCA report stops short of assigning the sensitivity, stating “*the sensitivity remains higher in the more intact areas*”. However, the area to the northeast around Clonderlaw Bay is designated Heritage Landscape in the CCDP and therefore the sensitivity in terms of the scale, landform, landcover, seascape and built environment is considered Medium with an overall Sensitivity of Medium/High.

#### 4.11.2.3 Limerick County Development Plan 2022-2028

The Limerick County Development Plan (LCDP) 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 Designated Development.

#### Views and Prospects County Limerick

<sup>56</sup> Draft County Clare Development Plan 2023-2029, Map H10 Areas of Special Control (extract)



A scenic road is indicated along sections of the N69 between Tarbert and Foynes with a loop south across higher ground to Glin as shown in Plate 4.12.

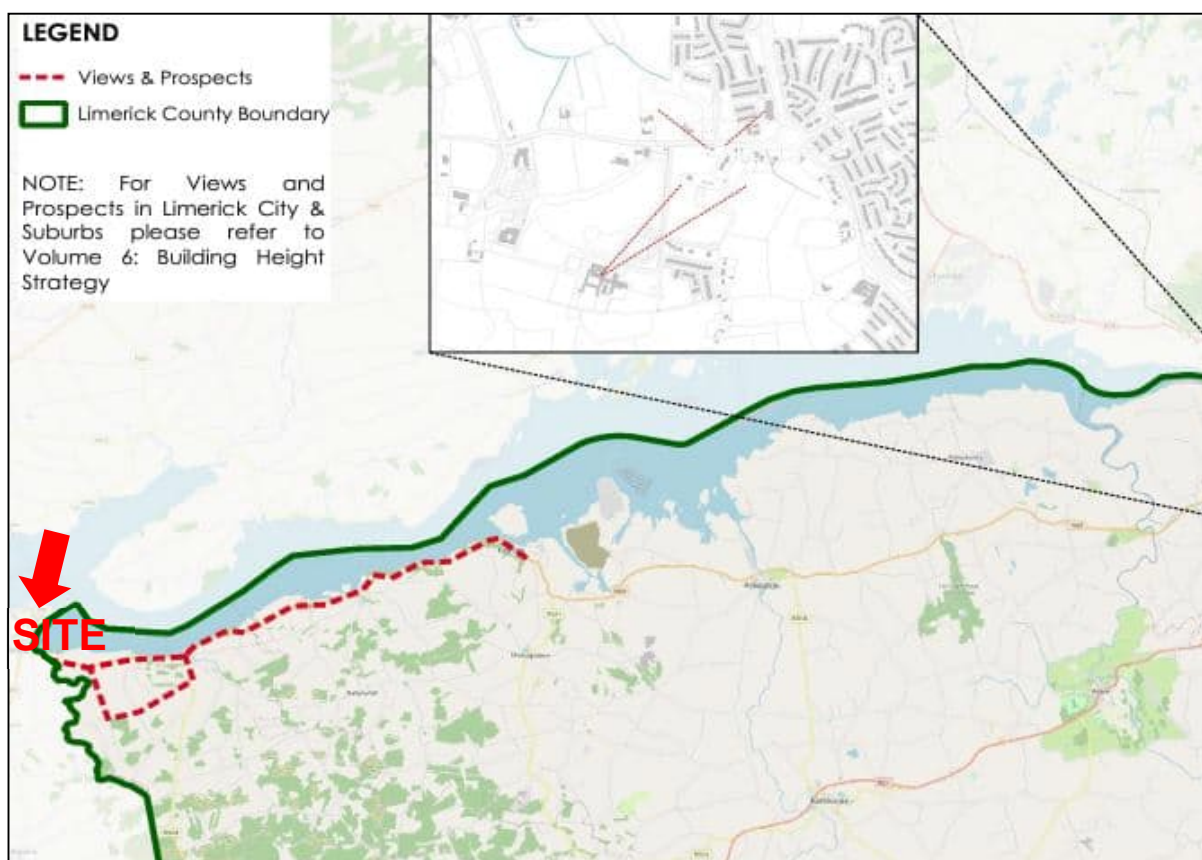


Plate 4.12: N69 Scenic route east of the Designated Development<sup>57</sup>

### Landscape Value County Limerick

The Landscape Character area of the northwest corner of Co. Limerick is identified as the Shannon Integrated Coastal Management zone (ICZM) and comprises a large area of northern Limerick. It is bounded on one side by the Shannon Estuary. The LCDP refers to a range of relevant objectives development under the SIFP to adhere to the mitigation measures for landscape management as appropriate.

### Study Area

A study area radius of 7km has been determined from the boundary of the Designated Development for the assessment of landscape and visual effects. The extent of the study area is based on initial findings of the desktop study.

It is acknowledged that the Designated Development may be visible from locations beyond the 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.

### 4.11.3 Likely Main Effects on Environment

#### Do Nothing Scenario

<sup>57</sup> Limerick County Development Plan 2022-2028, Map 6.2 Views and Prospects (extract)

The 'do nothing' scenario would not result in any significant changes to the baseline reported in section 4.11.2.

#### **4.11.3.1 Landscape and Seascape effects**

The Designated Development Site is located within existing Tarbert Power Station Site. The lands are zoned for industrial development. The Designated Development Site is currently in a brownfield condition. There will be no dismantling or demolition required for the construction of the Designated Development, but dismantling will be associated with decommissioning works required for the Designated Development at the end of its use.

Direct or indirect effects on the fabric of the landscape and seascape and its receptors are closely related to the nature and extent of visibility. The introduction of the development will not significantly modify the landscape character of the Designated Development Site, it will remain industrial.

Direct change at the Site location, including built structures associated with the three Open Cycle Gas Turbines (OCGT) and three 30m stacks contribute to the densification of the industrial character.

Indirect change to the existing landscape and seascape character will reduce with increasing distance from the Designated Development in the remaining study area (beyond approximately 1km from the Designated Development Site boundary). The Designated Development will be seen in conjunction with existing significant power station infrastructure. The addition of the Designated Development will be noticeable, but it will not alter the landscape and seascape character significantly due to the proposed scale, location, and nature of the Designated Development within an existing industrial environment.

#### **4.11.3.2 Visual effects**

The main visual receptor groups are residents, vehicle travellers including ferry passengers, workers, and visitors/tourists. Residents will have the higher sensitivity to change than road users or ferry passengers. Vehicle travellers and workers will focus mainly on traffic or their commercial tasks and not primarily on available views. Ship passengers will view the Designated Development in conjunction with the prominent existing Tarbert Power Station and Moneypoint Power Station structures.

Close distance (within approximately 500m) visual effects will mainly relate to the introduction of additional built structures and the associated stacks. The existing nature of the Site is industrial with power infrastructure. Intervening bands of vegetation, some mature boundary planting and topography soften the impact of the existing industrial developments from the east, south and west. The existing Tarbert Power Station features prominently in available views, including the existing built structures/storage tanks and the two original 151m concrete chimney stacks - the most notable feature of height in the landscape along the Co. Kerry and Co. Limerick shores of the Shannon Estuary within the study area.

Middle and long distance views (ranging between approximately 500m – 2km and beyond) are often panoramic towards the Designated Development Site. They are available from open waters and the northern shores, including some of the hinterland for example from sections of the N67 and R486 as well as the local road network, of the estuary in Co. Clare. A number of distant views along the N69/Coast Road (Co. Limerick) east of the Designated Development Site will be possible. The Designated Development will be visible as part of the existing Tarbert Power Station as well as in

combination with the existing Moneypoint Power Station, located along the northern shore of the estuary, forming part of an existing significant industrial cluster of power plant infrastructure on the estuary. It is considered that the Designated Development will intensify the industrial components of available views slightly, but it will not significantly alter the existing visual amenity in the mid-distance or in long distance views where available.

#### **4.11.4 Construction Phase – 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 Designated Development.

The Designated Development will be located southwest of the existing Talbert Power Station and the proposed emission stacks for each of the temporary emergency generation units will be 30m in height, for context the existing power station stacks are 151m high. With the primary objective to minimise the visual impact of the Designated Development so it is as unobtrusive as feasible against the existing environment backdrop the stacks will be finished in a light grey colour (RAL7038). The proposed colour scheme will help to take the attention away from individual elements and help blending-in the various elements with the landscape in possible available views from local residences, the public road network, and in estuarine views across the River Shannon including designated views and prospects, scenic routes, and the Wild Atlantic Way.

There are elements of the existing facility that are screened by boundary vegetation from the sensitive receptors to the southeast of the Designated Development. The houses approximately 250m south of the Site may have limited screening provided by the existing surrounding environment, topography and vegetation which will reduce some elements of the Designated Development. It is essential that tree protection measures as described in BS 5837:2012 are applied in order to protect the existing trees within the Site during the construction phase.

A suite of mitigation measures has been provided by the ecology team setting out the measures to be implemented when undertaking any works which will affect protected species and there is no pollution of watercourses, waterbodies, or terrestrial habitats, in accordance with guidelines such as Construction Industry Research and Information Association's (CIRIA) Control of water pollution from construction sites (CIRIA, 2001).

The contractor compound located to the west and north of the Site in 'Zone A' and further north will be afforded some screening from the existing Tarbert Power Station. Plant and material stockpiles in will be situated in areas suitably screened from external views where possible. The movement and activity of plant, which has a notable visual presence due to size/ scale and lighting, will remain a transient issue, irrespective of where the Site compound location. It is proposed a perimeter fence (5 to 8m ) will be erected prior to constructing to provide visual and acoustic screening.

The lighting design measures outlined include that lighting will be minimised in terms of number of lights and the power of the lights (lux level) during construction. Directional lighting, facing and located away from the Site's boundary will be used; and lighting will be turned off when not required except to meet the minimum requirements for Health and Safety.

#### **4.11.5 Operational Phase – Mitigation Measures**

The proposed colour scheme will help to take the attention away from elements of the development such as stack/tanks and help integrate the Designated Development visually with the landscape in available views from local residences, the public road network, the shore, and across the harbour including sensitive views and prospects particularly along scenic routes. The lighting measures outlined include that lighting will be minimised in terms of number of lights and the power of the lights following construction.

#### **4.11.6 Residual Effects**

Given the scale and location and temporary nature of the Designated Development, the main landscape and visual mitigation measures focus on colour treatment and minimising lighting during night-time and protection of open waters from light spill. These measures will come into effect following the completion of construction works. Proposed landscape mitigation measures will enhance the screening of the lower parts of the Designated Development including the entrance road.

## **4.12 Traffic Management**

### **4.12.1 Introduction**

This section of the report sets out the predicted traffic effects and traffic management of both the construction and operational phases of the Designated Development.

Effects arising from the decommissioning phase of the Designated Development are of a similar or lesser volumes of traffic and duration to those arising from the construction process and therefore have not been considered separately in this document. Where this assessment refers to likely construction effects, these are also representative of predicted decommissioning effects.

### **4.12.2 Baseline**

The Tarbert Power Station Site access is directly from the N67 which is part of the National Primary Road Network. The N67 is approximately 2.3km in length and provides access to Tarbert Power Station and Tarbert Ferry Dock. This road therefore does not include through traffic and is relatively lightly trafficked with a high percentage of HGV traffic associated with the existing power station and ferry.

The N67 travels south from the Site and connects to the N69 which allows for travel further south to Tralee and east towards Co. Limerick. The N69 provides a direct connection between the Designated Development (via N67) and Foynes Port in Co. Limerick. This means that large service vehicles do not have to travel on small minor roads to reach the Designated Development Site.

A Transport Infrastructure Ireland (TII) permanent traffic counter located on the N69 between the Site and Foynes Port recorded a seven-day average daily two-way traffic flow of 2,572 vehicles and an HGV percentage of 5.04% (two-way flow based on data from the past seven days on 12 January 2023). This is expected to be a higher flow than the N67 due to the N69 providing connectivity to the wider highway network, rather than the N67 which provides connection to the existing Tarbert Power Station and the Tarbert ferry terminal providing services to Kilrush in Co. Clare.

The National Primary Road Network is maintained regularly and has been constructed to accommodate large volumes of both LGV and HGV traffic. It is therefore concluded the N67 and N69 have the capability of continuing to accommodate service vehicle movements generated by the Designated Development.

The N67 also connects to the R551 which travels south-west and is part of the Regional Road Network. Regional Roads provide connections between towns and also to the National Roads. This road is likely to be used less frequently than the National Roads during the Designated Development's construction and operational phases, however, has the potential to be used by both the LGV and HGV traffic.

### 4.12.3 Likely Main Effects on Environment

#### Do Nothing Scenario

If the Designated Development were to not go ahead, the surrounding road network will remain in the current conditions.

#### Construction Traffic Generation

During the construction period there is expected to be a maximum of 200 staff on site each day. Staff are expected to travel to the Site via a combination of carsharing and single occupancy vehicles, resulting in a maximum of 50 vehicle (LGVs) arrivals per day (100 two-way movements).

It is also expected that at peak construction there will be 50 deliveries per week associated with equipment such as concrete mixers and cranes and 15 vehicle arrivals per week associated with the delivery of goods. Based on a five day working week this equates to a total of 13 HGV daily arrivals (26 two-way trips) associated with the delivery of equipment and goods.

#### Cut and Fill

There will be a total of 29,000m<sup>3</sup> of cut to be taken from the Site and 7000m<sup>3</sup> of fill to be delivered. Based on 15m<sup>3</sup> capacity per vehicle (20 tonne tipper lorry) and delivery on five days per week for a total of six weeks, results in 80 daily HGV arrivals per day i.e., 160 two-way trips per day.

Once a detailed construction programme is created, the maximum trips per day can be calculated accurately. However, in the absence of this information, it has been assumed that all trips noted above would arrive on the same day i.e., maximum staff trips, and trips associated with goods, equipment and cut and fill. The daily arrivals are set out below in Table 4.52.

**Table 4-52 Traffic Generation Estimated at Site (arrivals)**

<b>Construction Phase</b>	<b>Staff Arrivals / Day (LGVs)</b>	<b>Good and Equipment Arrivals / Day (HGVs)</b>	<b>Cut and Fill Arrivals / Day (HGVs)</b>	<b>Total Arrival Trips / Day</b>
Peak Construction	50	13	80	143

As shown above in Table 4.52, there is expected to a worst-case arrival flow of 143 vehicles per day (286 two-way trips). This is split as 50 LGV arrivals (100 two-way) and 93 HGV arrivals (186 two-way trips).

Due to the Site being directly connected to the National Primary Road Network, it is expected that the neighbouring roads will be able to cope with this temporary higher HGV flow.

### Construction Traffic Distribution

As previously mentioned, the Site is well connected to the wider National (N) Road Network. It is therefore proposed that all HGV vehicles, and LGV vehicles where possible, will travel to the Site along N Roads only, only using Regional roads when N roads are not an option (for example for specific suppliers and/or if road diversions are in place by the local authority).

The National Road Network is built to withstand high volumes of HGV and LGV traffic and therefore this routing will minimise the negative impact that larger/heavier vehicles would have on more minor road pavements.

### Construction Traffic Effect

As previously noted, the existing daily two-way traffic flow on the N69 is 2,572 vehicles and on a peak day there are expected to be 286 two way trips to/from the site. This additional construction traffic results in an impact of 11.1%.

Increases below 10% are generally considered to be insignificant given that daily variations in traffic flow may fluctuate by this amount. As this threshold is only marginally exceeded, it is not expected to result in a major significant impact on the road network. It is also considered that the assessment considered an extreme worst case traffic generation which may not happen in reality. Additionally, the traffic assessed is only temporary and could peak at this level for a very short time period. This time period will be detailed by the appointed contractor.

The traffic impact on the N67 is likely to be higher due to the expected lower baseline traffic flow, however, as this road is part of the National Road Network the volumetric capacity and pavement construction is considered capable of coping with the temporary increase in traffic and therefore the effect will be insignificant.

#### 4.12.4 Construction Phase – Mitigation Measures

- The access points to the Site are located off the N67. In order to minimise disruption to local traffic and maintain the safety of road users, the Contractor will be required to establish a traffic management system. This will account for:
  - Planning and controlling the movement of vehicles, plant and non-motorised users that are present within the Site, access to and egress from the Site and on the adjacent road network; and
  - Ensure that safety of construction operatives, motorised and non-motorised users are not compromised.
- This will be achieved by effective implementation of a Construction Traffic Management Plan (CTMP) to be prepared and initiated by the Contractor. A Framework CTMP is included within Appendix C of this report and will ensure the construction site is organised so that vehicles and pedestrians using site routes can move around safely. The CTMP shall be included as part of the Contractor's CEMP. The objective of this plan will be to:

- Limit journeys to and from the Site by the workforce, sub-contractors, suppliers, and anyone else who is likely to visit the site regularly;
- Provide protection from traffic hazards that may arise as a result of the construction activities and journeys to and from the Site;
- Installation of mirrors and construction traffic warning signs at site entrance junction;
- Manage potential adverse impacts on the public road network and ensure network performance is maintained at an acceptable level;
- Minimise adverse impacts on users (motorised and non-motorised) of the public road network and adjacent properties and community facilities;
- Plan deliveries to the Site;
- Ensure adequate signage is in place at Site access points before use; and
- Ensure that the roads and footways at the site access are kept clear of debris, runoff, soil, and other material (complementing the Site wheel wash facilities if required).

Traffic will be restricted to designated local roads. Traffic management will be closely monitored on-site, and ensure the safety of local road users, pedestrians, equestrians, and cyclists is maintained.

Traffic management measures will be in operation to facilitate safe passage for pedestrians and others, including barriers defining the footpaths and safety zones to prevent construction vehicles encroaching on pedestrian areas. Where appropriate, segregated pedestrian routes will be provided. Temporary warning signs will be erected as necessary to highlight particular hazards, including site accesses and temporary traffic management measures.

Although unlikely to be required due to the Site being covered in areas of hardstanding, a mobile road sweeper will be used to remove any site vehicle-tracked mud and dirt from the public highways (N67) and the construction Site access.

### **Access to the Site**

- In all cases, the Contractor will prepare a condition report showing condition of lands and road surfaces prior to commencement of use of the accesses.
- The Contractor will prepare and submit a haulage route plan showing the internal routes proposed for all materials and equipment deliveries to the Site. This plan will be approved by the Construction Project Manager prior to implementation. Details of any systems and signage to ensure correct routing of vehicles will also be included. The haulage route plan will also include the inspection and maintenance strategy for these routes.
- The Contractor will erect appropriate signs to show any accesses and restricted routes.

### **Public & Private Roads, Accesses, and Rights of Way**

No public rights of way or other rights of way are being affected and / or diverted.

#### 4.12.5 Operational Mitigation – Mitigation Measures

As outlined above the number of operational trips to the Site are expected to be minimal and therefore require no additional mitigation.

#### 4.12.6 Residual Effects

The short-term increase in traffic is insignificant and is therefore likely to result in minimal residual environmental effects in terms of temporary construction traffic.

This is achieved using a CTMP. A Framework CTMP is provided in Appendix C.

## 4.13 Waste Management

### 4.13.1 Introduction

This section sets out the relevant aspects of legislation and policy, the current state of the environment and the future receiving environment and goes on to consider the impact of the Designated Development on waste management. This section also outlines the measures that will be undertaken to minimise the quantity of waste produced at the Site and the measures to handle the waste in such a manner as to minimise the effects on the environment.

For the purpose of this report, 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'<sup>58</sup>.

Effects arising from the process of decommissioning of the Designated Development are of a similar or lesser volume and duration to those arising from the construction process and therefore have not been considered separately in this document. Where this assessment refers to likely construction effects, these are also representative of predicted decommissioning effects.

### 4.13.2 Baseline

#### 4.13.2.1 Legislation

##### European Communities (Waste Directive) Regulations, 2011

The European Communities (Waste Directive) Regulations S.I. No. 126 of 2011<sup>59</sup> (as amended) transpose the requirements of the European Waste Framework Directive (Directive 2008/98/EC)<sup>58</sup>, as amended by Directive (EU) 2018/851<sup>60</sup>, into Irish legislation. The Regulations require that waste prevention programmes and waste management plans are established and that they apply the waste hierarchy. The waste hierarchy prioritises waste prevention, followed by preparing for re-use, recycling, other recovery (including energy recovery) and finally disposal.

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<sup>58</sup> European Parliament and The Council of the European Union (2008). European Waste Framework Directive (Directive 2008/98/EC). Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02008L0098-20180705>.

<sup>59</sup> GOI (2011). S.I. No. 126/2011 - European Communities (Waste Directive) Regulations 2011. Available at: <https://www.irishstatutebook.ie/eli/2011/si/126/made/en/print>

<sup>60</sup> European Parliament and The Council of the European Union (2018). Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste (Text with EEA relevance). Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32018L0851>.



For construction and demolition waste, the Regulations also require measures to be taken to achieve the following target:

- By 2020, the preparing for re-use, recycling, and other material recovery, including backfilling operations using waste to substitute other materials, of non-hazardous construction and demolition 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.

To support the implementation of the waste hierarchy, the Regulations 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 section 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 construction and demolition waste.

### **Circular Economy and Miscellaneous Provisions Act 2022**

The Circular Economy and Miscellaneous Provisions Act 2022<sup>61</sup> provides for the following:

- 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 Environmental Protection Agency (EPA) of a circular economy programme.
- A levy on certain single-use items.
- The prohibition on the supply of certain single-use items.
- To give further effect to Directive (EU) 2015/720 of the European Parliament and of the Council of 29 April 2015 and Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019.
- The making of a national food waste prevention strategy.
- 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 re-used and repaired products and materials in waste management plans.

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<sup>61</sup> House of the Oireachtas (2022). Circular Economy and Miscellaneous Provisions Act 2022. Available at: <https://www.oireachtas.ie/en/bills/bill/2022/35/>

- The introduction of a requirement for segregated waste bins and incentivised charging for the commercial sector.
- 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 Environmental Protection Agency.
- 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 Environmental Protection Agency 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.

### European Green Deal

The European Green Deal<sup>62</sup> 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 re-used.

### A Waste Action Plan for a Circular Economy

A Waste Action Plan for a Circular Economy, Ireland's National Waste Policy 2022-2025<sup>63</sup> sets out Ireland's approach to transitioning to a circular economy.

For construction and demolition waste, the Plan supports the provisions and targets of the European Communities (Waste Directive) Regulations<sup>59</sup> by undertaking to streamline the decision-making

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<sup>62</sup> EC (2022). European Green Deal. Available at: [https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/delivering-european-green-deal\\_en](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/delivering-european-green-deal_en)

<sup>63</sup> GOI (2020). A Waste Action Plan for a Circular Economy. Available at: <https://www.gov.ie/en/publication/4221c-waste-action-plan-for-a-circular-economy/>

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 construction and demolition waste recovery target.

The Plan 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 commenced in 2021 and will be informed by the outcomes of this evaluation.

### **Climate Action Plan 2023**

The Climate Action Plan 2023<sup>64</sup> includes a suite of measures to help reduce waste and 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.
- Reduce food waste by 50% and ensure that all plastic packaging is reusable or recyclable by 2030.
- Increase capacity to recycle packaging waste by 70%, and plastic package waste by 55%.
- Enact the Circular Economy and Miscellaneous Provisions Act 2022.
- Publish a whole-of-Government Circular Economy Strategy and promote the circular economy, including focusing on awareness raising, Green Public Procurement and international partnerships.
- Develop and implement a National Bioeconomy Action Plan.
- Develop new and expanded environmental levies to encourage reduced resource consumption and incentivise higher levels of re-use and recycling.
- Establish a Circular Economy Innovation Scheme.
- Develop a Food Waste Prevention Roadmap that sets out a series of actions to deliver the reductions necessary to halve our food waste by 2030 and promote our transition to a circular economy.

#### **4.13.2.2 Planning Policy and Guidance**

##### **Southern Region Waste Management Plan 2015-2021**

For the purposes of waste management planning, Ireland is divided into three regions. The Designated Development is located within the Southern region and the *Southern Region Waste Management Plan*

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<sup>64</sup> DECC and the Department of the Taoiseach (2023)

2015-2021<sup>65</sup> provides the framework for the prevention and management of wastes in a safe and sustainable manner.

### **Kerry County Development Plan 2015-2022**

The County Development Plan 2015-2021<sup>66</sup> incorporate the aims, objectives, policies, and guidelines to provide for the proper planning and sustainable development of Co. Kerry. Objectives that relate to waste include: *“ES-36 Ensure that proposals for new industrial/commercial developments, extension, or refurbishment of an existing development, maximise clean technology, waste minimisation and energy and water conservation in their design and operational practices. Any proposal shall demonstrate compliance with objective ES-11 and all other objectives and Development Management, Standards and Guidelines of this Plan.”* This existing Development Plan has been extended until the new Kerry County Development Plan 2022-2028<sup>67</sup> draft has been reviewed and comes into effect.

### **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 Projects*<sup>68</sup> provide a practical approach which is informed by best practice in the prevention and management of construction and demolition 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 resource and waste management plans.

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.

#### **4.13.2.3 Construction and Demolition (C&D) Waste Arisings and Waste Management in Ireland**

The study area for assessing impacts of non-hazardous and hazardous waste on waste arisings and inferred waste management capacity comprises the whole of Ireland due to the need to consider all available waste management infrastructure capacity, although it is noted that a proportion of hazardous waste arising in Ireland is managed outside of Ireland. Waste management capacity is inferred from national waste arisings since data for national waste management capacity is not readily available. Information has been sourced from the most recent data collated and published by the EPA<sup>69</sup>.

Approximately 8.2 million tonnes of C&D waste were collected by authorised waste collectors in Ireland in 2020, with the majority comprising soil and stones and dredging spoil (84%, 6.9 million tonnes). The remainder consisted of metals, segregated wood, glass and plastic, concrete, brick, tile, and gypsum, bituminous mixtures, and mixed C&D waste (1.3 million tonnes).

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<sup>65</sup> Southern Waste Region (2015). Southern Region Waste Management Plan 2015-2021.

<https://southernwasteregion.ie/content/southern-region-waste-management-plan-2015-2021-associated-reports/>.

<sup>66</sup> Kerry County Council (2015). Kerry County Development Plan 2015-2021. Available at: <https://cdp.kerrycoco.ie/kerry-county-development-plan-2015-2021/>.

<sup>67</sup> Kerry County Council (2022). Draft Kerry County Development Plan Draft 2022-2028. Available at: <https://consult.kerrycoco.ie/en/consultation/draft-kerry-county-development-plan-2022-2028>.

<sup>68</sup> EPA (2021). Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects. Available at: <https://www.epa.ie/publications/circular-economy/resources/CDWasteGuidelines.pdf>.

<sup>69</sup> EPA (2022). National Waste Statistics 2020 Summary Report for 2020. Available at: [https://www.epa.ie/publications/monitoring--assessment/waste/national-waste-statistics/EPA\\_National\\_Waste\\_Stats\\_Summary\\_Report\\_2020.pdf](https://www.epa.ie/publications/monitoring--assessment/waste/national-waste-statistics/EPA_National_Waste_Stats_Summary_Report_2020.pdf).

In 2020, waste treatment by backfilling was the most utilised treatment method, managing 82% of C&D waste, and mainly comprising of soils, stones and dredging spoil.

The EPA's 'Progress to EU Targets'<sup>70</sup> reports Ireland's performance against targets set out in European Directives. In terms of the Waste Framework Directive (2008/98/EC)<sup>58</sup> 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 84% was reported for 2019, exceeding the 70% target. Ireland achieved 78% material recovery of non-hazardous, non-soil-and stone C&D waste in 2020<sup>69</sup>.

#### 4.13.2.4 Commercial Waste Arisings

Municipal waste consists of household waste, commercial waste and other waste that is similar in nature to household waste such as waste from schools, restaurants, businesses etc. Ireland generated 3.2 million tonnes of municipal waste in 2020. Households generated 57% of municipal waste and 43% came from other sources<sup>69</sup>.

#### 4.13.2.5 Waste Management Facilities

The waste management facilities to be utilised by the Designated 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.

#### 4.13.2.6 Hazardous Waste Arisings and Management

The EPA reported that 557,221 tonnes of hazardous waste were generated in Ireland in 2020<sup>71</sup>. The construction sector produced 32% of Ireland's hazardous waste in 2020. This mainly comprised dredging spoil and contaminated soil, but also included smaller quantities of asbestos, asphalt, and contaminated wood, concrete, bricks, metals, and tiles.

#### 4.13.2.7 Future Receiving Environment

The Construction & Demolition Waste - Soil and Stone Recovery / Disposal Capacity - Update Report 2020<sup>72</sup> presents a forecast of potential that 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 Designated Development through to its opening year.

### 4.13.3 Likely Main Effects on Environment

The likely main effects of the Designated Development with regards to waste are the effects that waste arisings generated on-site will have on the capacity of waste management infrastructure in Ireland and on meeting national targets for waste recovery. If the Designated Development generates more than 5% of national waste arisings (347,332 tonnes of soil, stone and dredging spoil, 64,089 of tonnes of

<sup>70</sup> EPA (2021). Progress to EU Waste Targets. 1 December 2021. Available at: <https://www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/progress-to-eu-targets/>

<sup>71</sup> EPA (2021). Hazardous Waste Statistics for Ireland. Available at: <https://www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/>

<sup>72</sup> Eastern Midlands Region / Connacht Ulster Region / Southern Region (2020). Construction & Demolition Waste. Soil and Stone Recovery/Disposal Capacity. Available at: <http://southernwasteregion.ie/sites/default/files/National%20C%20%20D%20Report%20Dec%202020%20for%20Publication.pdf>

non-hazardous C&D waste, 27,861 tonnes of hazardous waste, 66,650 tonnes of municipal waste from other sources e.g., commercial) or has a recovery rate for non-hazardous C&D waste less than 70% then the impacts would be considered to be significant.

### **Do Nothing Scenario**

In a 'do nothing' scenario, there would be zero waste generation and disposal from the Designated Development and no significant effects.

#### **4.13.3.1 Construction Phase**

The main construction phase impacts will be associated with the management of waste from:

- excavated materials
- surplus or damaged construction materials;
- packaging;
- maintenance of plant and equipment used for construction; and
- construction workforce activities.

Excavation and clearing of 29,000m<sup>3</sup> of soil is estimated to be required. This is relatively small in the context of the national quantity of soils, stones and dredging spoil collected. Therefore, the quantities of waste from excavation are unlikely to be more than 5% of national waste arisings and therefore not considered significant.

Waste from construction is unlikely to be more than 5% of national waste arisings and therefore not considered significant. The precise composition and waste management route of this waste is dependent on several factors and will be further informed by the appointed Contractor, based on their experience of similar developments. It is assumed that all construction waste will be require off-site management.

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 will be further detailed in the appointed Contractor's RWMP.

The waste management facilities to be utilised during 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)). Since this recovery rate is above 70% this is therefore not considered significant.

#### **4.13.3.2 Operational Phase**

Operational waste impacts from the Designated Development are expected to be negligible and will be confined to occasional disposal, maintenance, and repair. Operational waste quantities are unlikely to be more than 5% of national waste arisings and therefore not considered significant.

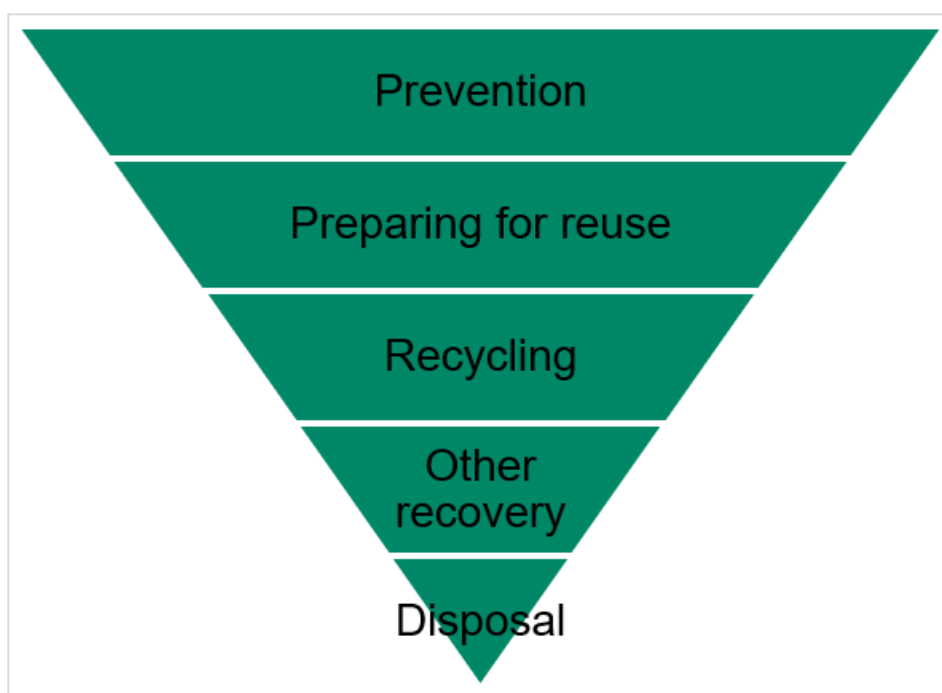
#### 4.13.4 Construction Phase – Mitigation Measures

A site-specific Resource and Waste Management Plan (RWMP) will be prepared by the Contractor. The RWMP will be employed to ensure sustainable and effective waste management throughout the construction phase of the Designated Development.

Adherence to the RWMP prepared for the construction works will ensure that the management of waste arising is dealt with in compliance with the provisions of the *Waste Management Act 1996* (as amended)<sup>73</sup>, associated Regulations, *Litter Pollution Act of 1997* (as amended)<sup>74</sup> and the *Southern Region Waste Management Plan 2015-2021*<sup>65</sup>, and *A Waste Action Plan For a Circular Economy*<sup>63</sup> and that it will achieve optimum levels of waste reduction, re-use and recycling.

#### Resource Management Routes

The Waste Hierarchy sets out the priority order that should be considered when managing wastes. A basic representation is provided in Plate 4.13. The appointed Contractor will use the Waste Hierarchy as a guide to encourage the prevention of waste and to define waste management options.



**Plate 4.13: Waste Hierarchy**<sup>75</sup>

When considering waste management options for the Site, the appointed Contractor will take account of the Site's location, natural environment, and available infrastructure. The appointed Contractor will consider the following options when determining the preferred waste management option for each waste stream.

#### Prevention and Preparing for Reuse

<sup>73</sup> GOI (1996). *Waste Management Act 1996*. Available at: <https://www.irishstatutebook.ie/eli/1996/act/10/enacted/en/html>.

<sup>74</sup> GOI (1997). *Litter Pollution Act*. Available at: <https://www.irishstatutebook.ie/eli/1997/act/12/enacted/en/print.html>

<sup>75</sup> European Commission (2022). *Waste Framework Directive*.

To reduce the potential impacts from materials and waste, and to achieve high levels of sustainability in the Designated Development as a whole, the appointed Contractor will apply the principles of the Waste Hierarchy and adopt best practice measures (BPM) which go beyond statutory compliance.

This may include BPMs set out in construction industry guidance for example, guidance from the Considerate Constructors Scheme (CCS), Waste and Resources Action Programme (WRAP) and Construction Industry Research and Information Association (CIRIA).

As outlined in the RWMP Guidelines the Resource Manager (RM) will engage with team or individuals tasked with procurement of materials and services to ensure best practice procedures are employed to prevent residual resources at the Site. A range of good practice measures will include the following:

- Select procurement routes to minimise unnecessary packaging, e.g., applying 'Just-in-Time' (JIT) delivery processes to minimise material spoilage.
- Use of 'consolidation centres' to support JIT delivery - these are strategically-located storage and distribution facilities where materials can be stored prior to JIT delivery to sites.
- Implement ordering procedures and supply chain systems that avoid waste, i.e., no over-ordering, use of take-back schemes for packaging, material surplus and offcuts.
- Select procurement routes that minimise unnecessary packaging.
- Plan the work sequence to reduce the potential for on-site residual resource generation.

The following approaches will be implemented, where practicable, to further minimise the quantity of waste arising and requiring disposal:

- Reuse of materials on-site wherever feasible, e.g., reuse of excavated soil for landscaping, recycling of demolition materials into aggregates.
- Off-site prefabrication, where practical, including the use of prefabricated elements.
- Segregation of waste at source, where practical, to facilitate a high proportion and high-quality recycling.
- Off-site reuse, recycling and recovery of materials and waste where reuse on-site is not practical, e.g., through use of an off-site waste segregation or treatment facility or for direct reuse or reprocessing off-site.

## Recycling

The aim is to reuse materials won on-site by recycling them into an alternative form that can be used for construction purposes (for example crushing concrete, brick, or other inert wastes to produce aggregate material). By recycling on-site, as far as practicable, the quantity of waste requiring off-site management is reduced and carbon emissions associated with transportation are eliminated.

Recycling may also be achieved by utilising materials with a recycled content, such as recycled aggregates produced off-site.

## Recovery



This generally aims to recover energy from waste which cannot otherwise be reused or recycled. This may include waste materials such as hazardous liquids or solids that can be sent to energy from waste facilities. Recovery may also include the beneficial use of materials on land for restoration (backfilling operations).

### **Disposal**

The least preferred option in the Waste Hierarchy is a final disposal route such as landfill. Some waste streams will inevitably end up with such a solution.

When placing waste disposal contracts, the appointed Contractor will consider the implications of long-distance travel in terms of health and safety risk, commercial terms, and increased emissions from vehicles.

### **Waste Storage**

The main waste storage area will be located within the Site compound. A dedicated and secure area containing bins, and / or skips and storage areas will be provided for waste materials generated by construction site activities.

Waste materials generated will be segregated at waste collection and storage areas where it is practical. Where the on-site segregation of certain waste types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source. All waste receptacles leaving site will be covered or enclosed. The appointed waste Contractor will collect and transfer the wastes as receptacles are filled.

Construction waste will be directed to recycling locations. There are a number of licensed waste reception facilities located in the Southern Region for the management of waste from the construction industry.

The Site construction manager will ensure that all staff are informed of the requirements for segregation of waste materials by means of clear signage and verbal instruction. Site employees will be made responsible for ensuring good Site housekeeping.

### **Pest Management**

A pest control operator will be appointed as required to manage pests on-site during the construction phase. Organic and food wastes generated by Site staff will not be stored in open skips, but in closed waste receptacles. Any waste receptacles will be carefully managed to prevent leaks, odours, and pest problems.

#### **4.13.5 Operational Phase – Mitigation Measures**

The Waste Hierarchy sets out the priority order that should be considered when managing wastes. A basic representation is provided in Plate 4.13. During operation the Waste Hierarchy (Plate 4.13) will be used as a guide to encourage the prevention of waste and to define waste management options.

### **Waste Storage**

A dedicated and secure area containing bins, and / or skips and storage areas will be provided for waste materials generated during operation.

Waste materials generated will be segregated at waste collection and storage areas where it is practical. Where the on-site segregation of certain waste types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source. All waste receptacles leaving site will be covered or enclosed. The appointed waste Contractor will collect and transfer the wastes as receptacles are filled.

Operational waste will be directed to recycling locations where possible. There are a number of licensed waste reception facilities located in the Southern Region<sup>6565</sup> for the management of operation waste.

The operational manager will ensure that all staff are informed of the requirements for segregation of waste materials by means of clear signage and verbal instruction. Site employees will be made responsible for ensuring good operational housekeeping.

#### 4.13.6 Residual Effects

Residual effects resulting from the Designated Development are not anticipated.

## 4.14 Interactions

Interactions or in-combination (inter-relationship) effects are by their nature interactive, the effect of one impact may be dependent or influenced by another effect. For example, the removal of trees can have landscape, visual and ecological effects, or an individual residential receptor can be affected by noise and visual impacts.

Without prejudice to the generality of paragraph (1), an assessment under that paragraph shall include an examination, analysis and evaluation by the Board in an appropriate manner, in light of the purpose referred to in section 2(1) of the Act of 2022, and to the extent reasonably possible in light of the information contained in the application and additional information (if any) provided in accordance with this Regulation by the applicant to the Board, of the likely main effects of the Designated Development on the following factors:

- (a) population and human health;*
- (b) biodiversity, with particular attention to species and habitats protected under Council Directive 92/43/EEC of 21 May 1992 and Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009;*
- (c) land, soil, water, air, and climate;*
- (d) material assets, cultural heritage, and the landscape;*
- (e) the interaction between the factors referred to in subparagraphs (a) to (d).*

The interaction of effects within the Designated Development in respect of each of the environmental factors, listed in Article 3(1) of the EIA Directive, have been addressed below.

A summary of the interactions (in-combination) of impacts and effects identified from the Designated Development between the following environmental aspects are outlined in Table 4.53:

- Air Quality

- Noise and Vibration
- Biodiversity
- Population and Human Health
- Land, Soils and Geology
- Water
- Climate
- Material Assets
- Cultural Heritage
- Landscape and Visual
- Traffic and Transportation
- Waste Management.

A summary of the key potential interactions are as follows:

- **Air Quality and Biodiversity:** Potential for nuisance impacts due to dust-generating activities of proposed works on sensitive SAC and SPA habitats.
- **Air Quality and Population and Human Health:** Potential for nuisance impacts due to dust-generating activities of proposed works on human health receptors.
- **Climate and Air Quality and Population and Human Health:** Potential for GHG emissions to be released to atmosphere during the construction, operational and decommissioning phases of the Designated Development.
- **Noise and Population and Human Health:** Potential for nuisance and disturbance due to noisy plant, noisy site activities and additional traffic as a result of the Designated Development.
- **Noise and Biodiversity:** There is potential for impacts on sensitive SAC and SPA habitats (*i.e.*, disturbance) due to noise and vibration during the construction, operational and decommissioning phases of the Designated Development.
- **Biodiversity and Water:** Potential for impacts to the surface water environment, which may in turn impact sensitive SAC and SPA habitats.
- **Biodiversity and Climate:** Potential for impacts to biodiversity, which may be exacerbated by climate change or the release of GHG emissions to the atmosphere as a result of the Designated Development.
- **Population and Human Health and Water:** Potential for impacts to the surface water environment
- **Population and Human Health and Landscape & Visual:** Potential for impacts on the landscape character and visual amenity during the construction and operational phase of the Designated Development.

- **Population and Human Health and Traffic and Transport:** Potential for nuisance and disturbance due to construction traffic noise on settlements in the vicinity of the Designated Development.
- **Population and Human Health and Waste Management:** Potential for impacts on human health receptors if waste is not management correctly, resulting in littering which could cause a nuisance to the public and attract vermin.
- **Water and Land, Soils and Geology:** Potential for contaminated surface water run-off to potential to enter soil and groundwater.
- **Land, Soils and Geology and Air Quality:** Construction activities such as excavations and stockpiling of materials, etc., have the potential to results in interactions between air quality and land and soils in the form of dust emissions.

Table 4.53 presents a summary of potential project wide in-combination effects considered.

**Table 4-53: Potential Combined Effects**

Environmental Aspect / Interaction	Air Quality		Noise & Vibration		Biodiversity		Population & Human Health		Land, Soils & Geology		Water		Climate		Material Assets		Cultural Heritage		Landscape & Visual		Traffic & Transportation		Waste Management	
	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																								
Noise & Vibration	X	X																						
Biodiversity	✓	✓	✓	✓																				
Population & Human Health	✓	✓	✓	✓	X	✓																		
Land, Soils & Geology	✓	X	✓	X	✓	✓	✓	✓																
Water	X	X	X	X	✓	✓	X	X	✓	✓														
Climate	✓	✓	X	X	✓	✓	✓	✓	✓	X	✓	✓												
Material Assets	X	X	X	X	X	X	✓	✓	X	X	X	X	X	✓										
Cultural Heritage	X	X	✓	X	X	X	X	X	✓	X	X	X	X	X	X	X								
Landscape & Visual	X	X	X	X	X	X	✓	✓	✓	X	X	X	X	X	X	X	X	X						
Traffic & Transportation	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	X	✓	✓	X	X	X	X	✓	✓				
Waste Management	X	X	X	X	X	X	✓	✓	✓	✓	✓	✓	X	X	X	X	X	X	X	X	X	X		

Con | Construction Phase | ✓ | Weak / Some / Strong Interaction

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Op	Operational Phase	x	No Interaction
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## 4.15 Cumulative

This assessment also takes into consideration cumulative impacts with consented, planned and reasonably foreseeable projects. A desktop search of proposed and existing planning application was undertaken in January 2023. The used publicly available data from the MyPlan.ie 'National Planning Application' database, Kerry County Council, Limerick County Council and Clare County Council planning application portals and An Bord Pleanála online database.

The purpose of this search is to inform the cumulative impact assessment for the Designated Development. A specified criteria informed the search and omitted any planning applications greater than five years old, refused, invalid and withdrawn applications. The criteria then focused on foreseeable developments to be considered in line with the Designated Development. In respect of this, any small scale residential and extension type developments along with minor amendments, changes of use and small-scale farming / agricultural applications were omitted. Only reasonably foreseeable developments were considered, refer to Table 4-54.

**Table 4-54: Planning Search (5km radius)**

Planning application reference	Date submitted	Summary details	Applicant	Status	Distance from the Designated Development
PA08.311233	27/08/2021	10-year permission for proposed Shannon Technology and Energy Park consisting of power plant, battery energy storage system, floating storage and regasification unit, jetty, onshore receiving facilities, above ground installation and all ancillary structures/works.	Shannon LNG Limited	Requires further consideration	4.2km west
21549	25/05/2021	(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,	Donal Murphy Glencloosagh Energy Limited	Application Finalised Conditional	1.7km south-west

Planning application reference	Date submitted	Summary details	Applicant	Status	Distance from the Designated Development
		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 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.			
20850	18/09/2020	For changes to the previously permitted peaker power plant development (planning ref. 13/138). it is proposed to change the energy source for the charging of the battery energy 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.	Kilpaddoge Green Energy Ltd.	Application Finalised Conditional	1.75km south-west
19115	12/02/2019	The development will consist of 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 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	Glencloosagh Energy Limited	Application Finalised Conditional	1.65km south-west

Planning application reference	Date submitted	Summary details	Applicant	Status	Distance from the Designated Development
181290	21/12/2018	<p>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 are 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.</p>	Glencloosagh Energy Limited	Incomplete Application	1.65km south-west



Planning application reference	Date submitted	Summary details	Applicant	Status	Distance from the Designated Development
		<p>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 substation . Planning permission is sought for a period of 10 years. A Natura Impact Statement accompanies this application.</p>			
18878	10/09/2018	<p>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 electricity control building, 1 no. 110kv esb substation, single storey substation control building and associated electrical infrastructure, 1 no. 110 kv generator transformer, 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.</p>	Shannon Clean Tech Ltd	Application Finalised - Conditional	1.86km south-west

The planning applications identified in Table 4-54 are applications of a scale and nature that could have potential to act in-combination with the Designated Development to result in significant effects. When the planning search was undertaken, four of the seven planning applications had been granted consent while the other three are yet to be determined. No plans have been identified which could give rise to cumulative effects with the possible impacts from the Designated Development. The existing Tarbert power station, Shannon Liquefied Natural Gas (LNG) project and Moneypoint power station were assessed for cumulative air quality impacts which is reported in section 4.1 of this report.

With the exception of the Shannon LNG, which is located approximately 4.2km from the Designated Development, none of the projects will release emissions to air during their operation. Of the existing power stations assessed; Tarbert Power Station is located within the same wider site as the Designated Development, and Moneypoint Power Station is located approximately 3km from the Designated Development. The Process Emissions Contribution (PEC) of the Designated Development for NO<sub>x</sub>, SO<sub>2</sub> and nitrogen deposition at all modelled locations was well below 1% of the relevant critical levels / loads. Therefore, with such a small contribution the impact of the Designated Development on the cumulative PEC for nitrogen deposition and NO<sub>x</sub> is negligible. The modelling shows that, the Designated Development in-combination with the existing Tarbert Power Station, Moneypoint Power Station and Shannon LNG will not have adverse cumulative effects on any receptor.

With the exception of Shannon LNG, all of the projects with planning applications are located in a single area, a little over 1.5km from the Designated Development. The projects in this location are themselves relatively small. It is highly unlikely that all of these projects, plus Shannon LNG and the Designated Development will be under construction at the same time and even if they were, given the size of the developments any construction noise or dust would be controlled so as to be minimal within a short distance from the respective site boundaries and certainly would not extend to 1.5km. Likewise, construction traffic for each development would be limited and negligible in combination with Designated Development traffic as the construction traffic routes will not use the N67. Moreover, the Designated Development and Shannon LNG have sought to minimise as far as possible the disturbance impacts on residential and ecological receptors. It is therefore, considered to be very unlikely that there will be significant in-combination disturbance effects between the Designated Development and these other projects.

### Temporary Emergency Generation Projects – Cumulative

This section of the report assesses the *potential adverse effect* of the construction and operation of the Designated Development at Tarbert, Co. Kerry cumulatively with the construction and operation of the Temporary Emergency Generation ('TEG') project, located at West Offaly Power Station, Co. Offaly.

The TEG at West Offaly Power Station is also seeking planning approval under the Act and both projects are expected to be operational in a similar time frame.

This designated development is located on the Lower Shannon Estuary, Co. Kerry, and the TEG project at West Offaly Power Station is on the eastern bank of the River Shannon immediately south of Shannonbridge, Co. Offaly, 118km from the Site.

However, it has been determined that there will be *no potential for significant cumulative adverse effects* from the two developments, during the demolition (only relevant to the West Offaly Power Station Site) construction, operational or eventual decommissioning phases, due to the distance between the two development locations (direct distance c. 118km and in-stream distance >150km).

### Conclusion

Following a planning portal search of other proposed developments in the vicinity of the Site, it has been determined that there are no potential significant cumulative effects with other developments or committed schemes in the area, based on their scale, location, and potential interactions with the Designated Development.

## 5. Summary

Due to the emergency nature of this project and the *Development (Emergency Electricity Generation) Act 2022* ('the Act'), the Act allows for such development to be exempt from the provisions of Directive No. 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 ('the EIA Directive'), in accordance with Article 2(4) of that Directive. The European Commission has published guidance (2019/C 386/05) regarding application of exemptions under the EIA Directive (Directive 2011/92/EU of the European Parliament and of the Council, as amended by Directive 2014/52/EU) – Articles 1(3), 2(4) and 2(5). The guidance indicates that the need to ensure security of supply in electricity could amount to an 'exceptional case' to exempt a specific project from the requirements of the EIA Directive.

The Act provides for the application of arrangements for the alternative assessment of such development for the purposes of ensuring the objectives of that Directive are met. Article 2.4(a) also requires member states to consider whether another form of assessment would be appropriate. The Act also provides for the coordination of this assessment with the appropriate assessment of such development for the purposes of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, as amended.

The Designated Development is exempt from the provisions of the EIA Directive<sup>76</sup> on the basis that it is an exceptional case for the purposes of Article 2(4) of the EIA Directive and the application of those provisions would adversely affect the purpose of the Designated Development. The Minister will arrange for an environmental assessment of the Designated Development to be carried out by the Board to ensure that the objectives of the EIA Directive are met.

This Environmental Report considers the potential likely main effects on the environment associated with the construction, operation, and the eventual decommissioning phases of the Temporary Emergency Generation Project at the Tarbert site in Co. Kerry, which are necessary to facilitate the Designated Development.

This report also provides mitigation measures that will be implemented, as appropriate, to reduce the effects from the different phases of the Designated Development. All construction phase mitigation measures outlined in this report are detailed within the Framework CEMP (refer to Appendix B).

Through the use of these control measures, the construction phase impacts of the Designated Development are not considered significant and will be temporary in nature.

Similarly, during the operational phase of the Designated Development, the predicted effects have been assessed as not significant through the proposed control measures outlined in this report.

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<sup>76</sup> In accordance with Section 5(1) of the *Development (Emergency Electricity Generation) Act 2022*.

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# **Appendix A Technical Team**



## Environmental Report Lead

### **Dr. Richard Lowe – Director BSc (Hons) MSc PhD**

Richard is a Director with AECOM and has worked on the consenting of numerous energy projects in the UK and Ireland including OCGTs, CCGTs, reciprocating engines and, increasingly, decarbonisation projects including CCS enabled power stations and hydrogen production facilities.

Richard has worked on numerous international power projects located in Turkey, Italy, Netherlands, Mauritania, Turkmenistan, South Africa, Venezuela, Dominican Republic, Guatemala, Chile, Tanzania and Peru, covering environmental impacts and concept design issues, including acting as Lenders Advisor and appraising IFC compliance. Richard also directs industrial air quality work, having been involved in more than 200 assessments to date, interpreting dispersion modelling assessments to support BAT justifications for a wide range of industrial, power and development clients. In addition, Richard has conducted more than 40 due-diligence audits and specialises in mergers and acquisitions in the power sector. In addition, Richard has conducted more than 40 due-diligence audits and specialises in mergers and acquisitions in the power sector.

Richard has been Project Director for 6 DCO consent applications for CCGTs and OCGTs in the UK, ranging from 299MW to 2,500MW, including drafting of Requirements, assessment of CCR and CHP feasibility, BAT appraisal for cooling technology, stack height evaluation, consultation with key stakeholders and consideration of permitting and COMAH implications. Richard has led the environmental inputs to the DCO on all projects, as well as the planning and concept engineering inputs on two of them. All used the Rochdale Envelope approach to provide a flexible consent.

### **Rachel Devine - Principal Consultant BSc (Hons) MSc MRTPI**

Rachel is a Principal Environmental Consultant with over 10 years' experience in consultancy. She has worked on major infrastructure projects across the UK and Ireland, and has experience of both public and private sector projects and clients. Her experience has included site secondments working for contractors providing site experience including managing stakeholder engagement, preapplication discussions, discharging planning conditions, preparation of planning applications and managing of Environmental Statements, Scoping and Screening reports.

**Table A1: Expertise of the Environmental Technical Team**

<b>Technical Sections/ Role</b>	<b>Consultant</b>	<b>Qualification / Summary of Relevant Experience</b>
Air Quality	<b>Gareth Hodgkiss (AECOM)</b>	<b>Associate Director, BSc (Hons), MSc, MIEEnvSc, MIAQM</b> Gareth Hodgkiss is a full member of the Institute of Air Quality Management and the Institution of Environmental Sciences, with over 14 years' professional experience in the delivery of air quality services for various development led projects across the British Isles and further afield. Of relevance to the Proposed Development, Gareth has undertaken, reviewed and verified assessments of local air quality impacts of major remediation works and large construction projects, which have considered impacts on human health, amenity and sensitive ecology, to support planning applications and the requirements of the appropriate regulator.
Noise and Vibration	<b>Alex Southern (AECOM)</b>	<b>Principal Acoustic Consultant, BSc (Hons) MSc, PhD MIOA</b> Alex Southern has over 15 years of experience working in acoustics research and consultancy. He joined AECOM in 2012 and has built a wealth of experience in assessing industrial, commercial and residential developments. Alex has experience in a wide range of acoustics reach and consultancy, including measuring, predicting, modelling and assessing emissions from various industrial facilities including within the power and renewables sector. Alex was awarded the Institute of Acoustic young person's award for innovation and lead AECOM Auralisation capability, technology allowing stakeholders to hear a development before it is finished.
Biodiversity	<b>Tony Marshall (AECOM)</b>	<b>Technical Director, C Ecol, MCIEEM</b> Tony is a Chartered Ecologist with more than 12 years' experience in ecological consultancy. He leads AECOM's ecology teams in Ireland and Scotland. He has worked on large-sale infrastructure development projects across these countries, and elsewhere in the UK. He has extensive experience in Ecological Impact Assessment and Appropriate Assessment, at all stages of the processes, including screening / scoping, baseline data collection, assessment and reporting. In 2021 Tony was the technical lead for ecology and ornithology on the EIA for a proposed 910 MW low carbon power station with carbon capture and storage capabilities in the north-east of Scotland. Tony was responsible for developing and managing the robust programme of baseline field surveys and studies, and for authoring the biodiversity chapter of the EIAR. Tony has also worked for clients in Ireland where emissions to air was the key impact with the potential for effects on ecological receptors.
	<b>Susanne Dunne (AECOM)</b>	<b>Consultant Ecologist, BSc (Hons) Qualifying Member of CIEEM</b> Susanne has worked for four years as a professional ecologist for private and public sector clients. These have varied from road, rail and building infrastructure projects the Republic of Ireland and in Northern Ireland. Susanne has experience in a variety of species surveys, Appropriate Assessment (AA), Preliminary Ecological Appraisals (PEAs), and working on large national plans.
	<b>Clare McIlwraith (AECOM)</b>	<b>Associate Ecologist, CEnv MCIEEM</b> Clare is a Chartered Environmentalist and full member of CIEEM, with a background in terrestrial ecological assessments. She has 20 years' experience working as an ecological consultant and has significant experience of Ecological Impact Assessment (EclA) and Appropriate Assessment for large-scale development projects. Over the course of her career, she has worked on projects in the power, transport, property, and local government sectors including significant project experience with National Grid. Clare is a Committee Member of the Yorkshire and Humber Section of the Chartered Institute of Ecology and Environmental Management (CIEEM).
Population & Human Health	<b>Rachel Devine (AECOM)</b>	<i>As Above</i>
Water	<b>Jenny Rush (AECOM)</b>	<b>Associate Director and Hydrogeological Consultant, MSc, PDip, BA (Hons), CGeol</b> Jenny has more than 17 years of professional experience in this field. Jenny is a technical lead and AECOM-certified project manager on hydrogeological impact assessments, having regard of impacts from a variety of development types on groundwater receptors, resources and dependent ecosystems. She has gained considerable experience in option selection and impact assessment on Irish road

Temporary Emergency Generation Power Plant  
 Tarbert Power Station

**Technical Sections/ Role**     **Consultant**     **Qualification / Summary of Relevant Experience**

		projects, within challenging geological and hydrogeological settings, i.e., karst, as well as key experience in water resource assessment, management and protection, through work with UK water companies and Irish group water schemes.
Land and Soils	<b>Kevin Ford (AECOM)</b>	<b>Associate Director and Hydrogeological Consultant, MSc, UK and A BSc (Hons)</b> Kevin has more than 28 years of professional experience in this field. Kevin is a Project Director for site investigations, sampling programmes and geo-environmental assessments with regards to impacts of industrial developments on groundwater, soil and bedrock. He specialises in environmental site assessments in relation to soil, bedrock and groundwater contamination by a variety of organic and inorganic contaminants. Kevin have extensive experience of ground contamination assessment and remediation for both public and private sector clients in Ireland involving environmental due diligence, pre-construction site investigation, EIAR inputs, contaminated land remediation and construction phase soil waste management.
Climate	<b>Ben Murray (AECOM)</b>	<b>Associate Director, BSc (Hons) CEnv MIEMA</b> Ben Murray has over 20 years' professional experience in the field of carbon accounting and management, including the delivery of greenhouse gas and climate change assessments for a range of large scale infrastructure projects across the UK and Ireland. He has led the climate impact and mitigation assessments for inclusion in EIA for infrastructure projects across the power, road, rail, water and aviation sectors.
Material Assets	<b>Rachel Devine (AECOM)</b>	<i>As Above</i>
Cultural Heritage	<b>David Kilner (AECOM)</b>	<b>Principal Archaeological Consultant, BA (Hons), PG Dip, MSc, MIAI</b> David Kilner has over 20 years' experience in the heritage sector. Prior to joining AECOM, David was Senior Archaeologist with a commercial archaeological company based in Belfast which involved working all over Ireland. His experience covers a range of projects, from planning advice to archaeological baseline research and EIA to procuring and managing archaeological specialists and sub-contractors undertaking field survey.
Landscape and Visual	<b>Joerg Schulze (AECOM)</b>	<b>Associate Landscape Architect, Dipl.-Ing. (FH), LA, MILI</b> Joerg Schulze has over 16 years' professional experience working for clients in the private and public sectors. He has a comprehensive track record in developing and managing landscape and visual impact assessments of large industrial, commercial, residential, infrastructural, renewable energy, tourism and civic developments throughout the island of Ireland. He has extensive experience in all stages of the planning, design, tender and implementation process, contract management and as consultant for Part 8 applications for road schemes and EIA processes. He has prepared residential visual impact assessments, manages the production of photomontages and the preparation of zones of theoretical visibility and theoretical visual intensity mapping.
Traffic Management	<b>Emma Greenlees (AECOM)</b>	<b>Associate Director, BEng (Hons) CILHT MCIHT</b> Emma Greenlees is an Associate Director and Transport Development Planning Project Manager, responsible for the project management of projects throughout Northern Ireland. She is a Chartered Transport Planner with over 24 years' of experience in consultancy. She has been responsible for the transport planning inputs in support of the planning applications for a wide range of development types for both public and private sector clients. Experience includes Transport Assessment Forms, Transport Assessments, Service Management Plans, Parking Statements, Travel Plans, Access/Highway Improvement Design and transport inputs into Environmental Statements / Environmental Impact Assessments.
Waste Management	<b>Mike Bains (AECOM)</b>	<b>Technical Director, BSc (Hons), CChem MRSC</b> Mike Bains has 24 years' experience in environmental consultancy, predominantly in the field of waste management in Ireland, the UK and

Temporary Emergency Generation Power Plant  
Tarbert Power Station

**Technical Sections/  
Role**      **Consultant**      **Qualification / Summary of Relevant Experience**

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internationally. He has been subject-matter expert for waste management in a large number of major projects, including nationally significant infrastructure projects in the UK. Mike is also experienced in waste management in the pharmaceutical sector.

**Lucy Hill  
(AECOM)**

**Principal Resources and Waste management Specialist, BSc (Hons), MSc, University Advanced Diploma in Asphalt Technology, MCIWM, CRWM, CEnv**

Lucy Hill has 15 years' consultancy experience across a range of sectors including waste, oil and gas, manufacturing, industrial and pharmaceuticals and road, rail, airport and energy infrastructure. Expertise centres on strategic waste planning including site waste management planning and operational waste strategies, Environmental Impact Assessment (EIA), waste technology reviews, guidance document, case study production and facilitation designing out waste. Providing a pivotal link between EIA and practical aspects of resource and waste management. Lucy is an Individual Member International Solid Waste Association, International Waste Manager, member of the Hazardous Waste Working Group and UK committee, and member of the Editorial Panel for Proceedings of the Institution of Civil Engineers - Waste and Resource Management.

**Appendix B Framework Construction  
Environmental Management Plan  
(CEMP)**

# Temporary Emergency Generation Project

## Tarbert Power Station

Appendix B  
Framework Construction Environmental Management  
Plan (CEMP)

Project Number: 60697004

February 2023

Prepared for:

SSE Generation Ireland Limited

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## Executive Summary

This document has been prepared on behalf of SSE Generation Ireland Limited (the Applicant) to provide a framework for a Construction Environmental Management Plan (CEMP). The final/Contractor's CEMP will be produced by the contractor appointed by the Applicant to undertake the construction of the Designated Development. By implementing the measures set out in the following sections, the final CEMP will help to manage environmental issues appropriately during construction. These measures should therefore be considered as agreed embedded mitigation that will be applied to control the environmental effects of construction of the Designated Development.

**Section 1** provides an overview of the Designated Development, the Applicant, and a description of the Designated Development Site.

**Section 2** details the indicative construction programme, including construction facilities, delivery routes for construction materials, construction lighting and recycling and disposal measures for construction waste.

**Section 3** gives an indication of the additional information which will be included under each sub-section within the final CEMP. This includes a table summarising the potential impacts for each environmental topic (Air Quality, Traffic, Noise and Vibration, Biodiversity, Landscape and Visual, Land and Soils, Water, Materials Assets, Cultural Heritage, Waste, Population and Human Health and Climate) reported in the Environmental Report (ER) (AECOM, 2023). Mitigation and enhancement measures described in the ER to address construction impacts are also presented. Monitoring requirements for mitigation measures are described where these have been proposed in the ER and the responsibilities for implementation are to be confirmed in the Final CEMP. Submission and approval of the Final CEMP prior to commencement of construction is proposed to be secured by a condition.

**Appendix A** presents a Framework Resource Waste Management Plan (RWMP). This outlines the waste management strategy for the construction phase by considering likely waste arisings from construction activities and provides recommended management measures, considering the principles of the waste hierarchy. A final RWMP would be developed by the appointed construction contractor.

# 1. Introduction

## 1.1 Overview

This Framework Construction Environmental Management Plan (CEMP) has been prepared by AECOM on behalf of SSE Generation Ireland Limited (the 'Applicant').

The Applicant is seeking approval for a Temporary Emergency Generation (TEG) project ('the Designated Development') within the boundary of Tarbert Power Station, Tarbert, Listowel, Co. Kerry. The Designated Development will involve construction works, installation and operation and eventual decommissioning of three Open Cycle Gas Turbines (OCGT) with a total operational output capacity of 150Mwe on 13.55ha of land ('the Site') within the existing operational Tarbert Power Station Site boundary.

The Designated Development is described in Section 2 'Description of the Designated Development' of the *Temporary Emergency Generation Power Plant Tarbert Power Station Environmental Report (ER)*<sup>1</sup> and Section 1.3 of this CEMP.

## 1.2 The Applicant

The Applicant, SSE Generation Ireland Limited, part of the FTSE-listed SSE plc, is a leading developer, owner and operator of flexible generation, energy-from-waste, and energy storage assets, with over 600 direct employees across the UK and Ireland. SSE's vision is to become the leading provider of flexible thermal energy in a net-zero world. SSE Generation Ireland Ltd. currently operates the existing Tarbert Power Station.

In accordance with the provisions of the *Development (Emergency Electricity Generation) Act 2022*, SSE will apply to the Minister for approval under Section 7 of the Act to carry out the Designated Development.

SSE has entered into an agreement with EirGrid to progress certain time-sensitive works which includes the preparation of application documents to seek approval from the Minister for the Designated Development under the new legislation.

EirGrid identified the need for the Designated Development and identified the technology and the location *i.e.*, Tarbert Power Station, to provide temporary emergency electricity generation.

## 1.3 The Designated Development

The Designated Development consists of the installation of three OCGT units which will collectively have the capacity to generate 150MWe of temporary emergency electricity, site development and associated ancillary works required for the operation of the plant. The plant will operate as an emergency plant, with a maximum running time of 500 hours per annum, spending the majority of time on standby, and will be run to meet emergency security of supply needs while complementing renewable power generation sources.

The objective of the project is to facilitate and ensure security of supply and provide support to the electricity network during periods when there is a gap between the renewable power generation and power demand.

The three LM6000 units have been selected for development as they are able to respond to changes in electricity demand by starting up quickly and achieving full output within a short period of time.

With regard to the operational phase, it is envisaged that the Designated Development will have to be temporarily operational at the Site for approximately five years. At the end of the temporary period, the Designated

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<sup>1</sup> AECOM (2023)

Development will be decommissioned, dismantled, and removed from this Site. Decommissioning would therefore be expected to commence at some point during 2027 and 2028.

The Designated Development will comprise the following main components:

- 3 No. 50 MW Gas Turbine generators;
- 3 No. Exhaust stacks – 30m tall;
- 3 No. Fin fan Coolers with several control modules;
- 6 No. Fuel oil tanks (80m<sup>3</sup>) (containerised);
- 6 No. Containerised switchgear and control modules;
- 1 No. Fuel oil drain tank for filter change over;
- 3 No. Fuel oil storage tanks (1000m<sup>3</sup>);
- 2 No. Demineralisation treatment units;
- 1 No. Demineralisation water storage tanks (1320m<sup>3</sup>);
- 1 No. Raw and Fire water storage tank (2500m<sup>3</sup>);
- 2 No. Distillate fuel unloading and forwarding;
- 2 No. Pre Filters;
- 1 No. Coalescer Filter;
- 3 No. Fuel oil heaters;
- Instrument air compressors;
- 3 No. Generator circuit breakers;
- 2 No. Generator step-up transformers;
- 1 No. Administration building;
- 1 No. 220kV substation, and
- Circa. 560m underground cable to connect to an existing onsite 220kV substation

The construction phase of the Designated Development will comprise:

- temporary construction and laydown areas comprising hardstanding, laydown, and open storage areas;
- temporary facilities and stores;
- materials and plant storage;
- contractor compound and construction staff office and welfare facilities;
- temporary vehicle parking facilities; and
- signage.

In connection with and in addition to the above, the following infrastructure will be included:

- internal roads;

- external lighting, including lighting columns;
- security fencing and gates; and
- utilities, pipes, cables and connection to surface water drainage systems, oil-water separators, including channelling, culverting, crossings and works to existing drainage systems.

Further information on the Designated Development is provided within Section 2 'Description of the Designated Development' of the TEG Tarbert Power Station ER.<sup>2</sup>

## 1.4 The Designated Development Site

The Designated Development is located in Tarbert, Co. Kerry, Ireland within the existing Tarbert Power Station. The existing Tarbert Power Station occupies an area of approximately 42ha. The site on which the main elements of the Designated Development will be located is located on the western side of the existing Tarbert Power Station Site, immediately west of four existing fuel tanks which are associated with the existing operating power station. The Site for the Designated Development works is (hereafter referred to as 'the Site') 13.55ha.

The Site is off the N67 (a National Secondary road), situated on a brownfield site, and is surrounded by electricity generating, transmission and fuel storage infrastructure and will utilise an area of existing made ground, which is relatively flat in nature.

The area where the main components of the Designated Development will be located is bound to the north by fuel storage tanks which supply Tarbert Power Station and the Shannon Estuary; to the east by the Power Station, EirGrid 110kV and 220kV electrical transmission substations and an access road from the N67 National Secondary; to the south by a lagoon draining the Shannon Estuary and agricultural lands further south on the mainland; and to the west/northwest by Tarbert Jetty and the Shannon Estuary.

The Site will be accessed via the N67 from the southern or eastern entrances, which also serve the existing Power Station and the Tarbert-Killimer Ferry Terminal. The N67 connects the Designated Development Site to the N69 Tralee / Limerick Road, located approximately 1.8km to the south of the Site.

The Site is located adjacent to the Lower River Shannon Special Area of Conservation (SAC) and the River Shannon and River Fergus Estuaries Special Protect Area (SPA). Tarbert Bay is also a proposed Natural Heritage Area (pNHA).

## 1.5 The Purpose and Structure of this Document

This Framework CEMP sets out a series of proposed measures that would be applied by the Contractor to provide effective planning, management, and control during construction to control potential impacts upon people, businesses, and the natural and historic environment.

This Framework CEMP has been produced in conjunction with the ER with the aim of ensuring that design and impact avoidance measures reported in the ER are implemented and are effective, together with any additional mitigation measures proposed to reduce significant adverse effects. Site-specific controls, which will be included within the final CEMP, would be developed based on the measures set out in this Framework CEMP. The final CEMP will be developed by applying the commitments set out in this Framework, the ER, Natura Impact Statement (NIS) (AECOM, 2023) produced for the Designated Development and any conditions (should approval be granted).

It is expected that the Contractor will comply, as a minimum, with applicable environmental legislation at the time of construction, together with any additional environmental controls imposed by An Bord Pleanála (hereafter referred to as the Bord). The Final CEMP will, therefore, be designed with the objective of compliance with relevant

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<sup>2</sup> AECOM (2023)

environmental legislation, the mitigation measures set out within the ER, the NIS produced for the Designated Development, this Framework CEMP, and any conditions (should approval be granted). Any additional construction licences, permits or approvals that are required would be listed in the Final CEMP, including any environmental information submitted in respect of them.

Further guidance on specific areas, such as soil handling and dust management, are taken from industry best practice guidance documents, as set out in each discipline section of this Framework CEMP. The references to guidance documents are not intended to be exhaustive.

The Final / Contractor's CEMP will broadly reflect the structure of this Framework CEMP, which is as follows:

- **Section 2** provides an indication of the construction arrangements that have been assessed in the ER;
- **Section 3** presents additional information that might be included under each sub-section within the Final CEMP, which includes:
  - environmental impacts;
  - impact avoidance or reduction of measures to be applied, including any measures identified during the detailed design or construction phase;
  - any other additional mitigation measures;
  - additional surveys or monitoring considered necessary pre-construction or during construction in order to confirm the status of receptors, and the effectiveness of impact avoidance/mitigation measures;
  - corrective action procedure to be applied, where necessary; and
  - links to other complementary plans and procedures.
- **Appendix A** comprises a Framework Resource and Waste Management Plan (RWMP)

In summary, the final CEMP will identify how commitments made during the assessment (and reported in the ER) will be translated into actions on-site.

The Contractor will be responsible for working in accordance with the environmental controls documented in the Final CEMP, which will allocate responsibilities for environmental performance. The overall responsibility for implementation of the Final CEMP will lie with the Applicant.

## 2. Construction Phase Arrangements

### 2.1 Indicative Programme

At this stage, a detailed construction programme is not available, as this is normally determined by the Engineering, Procurement and Construction (EPC) contractor for the construction of the Designated Development.

Construction activities will progress from site set up and preparation, to construction and modular assembly works of the various components, followed by commissioning and testing of the Designated Development. Construction of the Designated Development could (subject to the necessary approvals being granted) potentially start in March 2023. Construction works would commence with initial site access and set up, pre-construction works, ground works, piling and construction of plant equipment. The construction programme and commissioning are expected to be completed within approximately nine months, see Table 2.1 for an indicative programme.

**Table 2-1: Indicative Construction and Commissioning Programme**

Task	Month of Programme								
	1	2	3	4	5	6	7	8	9
Site Access - Enabling and Preparation	█								
Groundworks associated with underground services		█	█	█					
Civils Works		█	█	█	█	█	█	█	
Installation of main equipment				█	█	█	█	█	
Electrical Connections			█	█	█	█	█	█	
Commissioning and Testing								█	█

The appointed Contractor will confirm the duration of construction phase works in the Final / Contractor's CEMP.

### 2.2 Working Hours

To address the urgent need to install the temporary emergency generation power plant, construction phase works will take place over a minimum of two eight hour shifts and on occasions, three eight hour shifts per day, seven days a week, during construction and commissioning phases, acting in full compliance with Irish labour and Health and Safety laws.

## 2.3 Environmental Training

### 2.3.1 Site Induction

All personnel working on the Designated Development shall attend a site induction. Personnel attending such an induction shall complete a site induction record acknowledging attendance and confirming that they understand and agree to comply with the requirements of the Designated Development Site. Copies of all certificates of competency, licences and other qualifications as deemed necessary by the Contractor shall be copied and documented. The environmental induction shall run concurrently with safety awareness training.

Induction shall include:

- overview of the goals and objectives of the environmental policy and CEMP;
- awareness in relation to the environmental risk associated with the Designated Development and methods of avoiding environmental risks as identified within the CEMP, the planning conditions, and any other relevant plans, documents, or reports;
- awareness of roles and individual responsibilities and environmental constraints to specific jobs;
- location of any sensitive receptors on or adjacent to the Site;
- location of habitats and species to be protected during construction, how activities may affect them and methods necessary to avoid impacts, controls to minimise noise and the importance of pollution prevention measures to protect nearby watercourses and sensitive receptors including residential properties;
- information on the environmental emergency response procedure to be followed onsite, should an environmental emergency occur, including contact details for key site personnel to contact in an emergency; and
- information on the storage locations of spill kits across site and on the correct use of spill kits.

### 2.3.2 Daily Pre-Work Briefings, Toolbox Talks and Training

All supervisors are required to carry out daily briefings at the commencement of each shift to ensure environmental issues specific to the work being performed are being understood, evaluated, and addressed. All personnel involved with site works must be briefed and sign onto the daily briefing form prior to commencing activities.

Toolbox Talks may be conducted prior to the start of specific work elements where there is a substantial environmental risk or when required to reinforce ongoing environmental issues and shall be repeated as necessary over the duration of the relevant works. Any toolbox talk training conducted shall ensure that relevant information is communicated to the workforce and that feedback can be provided on issues of interest or concern.

Personnel and sub-contractors working on environmentally sensitive sites shall be provided with environmental training to achieve a level of awareness and competence appropriate to their assigned activities. Targeted environmental awareness training may be provided to individuals or groups of workers with a specific authority or responsibility for environmental management or those undertaking an activity with a high risk of environmental impact. Environmental training will be recorded, and the records will be available for inspection upon request.

All personnel and staff involved in the construction, operation and decommissioning of the Designated Development shall be briefed on the ecological risks present and ecological sensitivities of the Designated Development Site and its environs through 'Toolbox Talks' and provision of clear information about protected species and restricted areas and activities and will be made aware of the presence of ecological features (including the QI / SCI features of European sites) in the vicinity of the Designated Development and the mitigation measures



and working procedures which must be adopted. Toolbox Talks shall also cover legal requirements and working arrangements necessary to comply with legislation. All staff (including sub-contractors) will receive regular updated talks and briefings.

Clear instruction on hazardous wastes and the particular dangers of each hazardous waste will be incorporated into training. Table 2-2: summarises the indicative environmental training that will likely be required to be undertaken as a minimum as part of the Designated Development.

**Table 2-2: Summary of Training Requirements**

Training	Target	Frequency	Record
Site Induction	All site personnel	Prior to working onsite	Induction Record Form
Daily Pre-working Briefings	All site personnel	Prior to commencing daily works	Briefing Record Form
Toolbox Talk	Personnel relevant to the topic	As required	Toolbox Record Form
Project Management Meeting	Project Managers, Engineers, and Site Supervisor	Monthly	Meeting Minutes Record
Environmental Training	Personnel relevant to the activity	Quarterly or more frequently as required	Training Attendance Form
Environmental Bulletin	All company and Project personnel	As required	Environmental Bulletin Form

## 2.4 Complaints

A Complaints Register for internal communication and for receiving, documenting, and responding to environmental complaints from external parties shall be established and will be maintained.

When a complaint is received (telephone calls and letters of complaint etc.), the following information must be taken as a minimum:

- Date and time of the complaint are recorded;
- Name of complainant (if provided); and
- Nature of the complaint.

A mechanism for managing stakeholders' questions, concerns, and grievances from local residents and stakeholders' shall be implemented, appropriate conflict resolution processes will be implemented to ensure any issues are heard by the developer. All complaints received from external sources and incidents must be reported to the CEMPC and the appropriate site personnel. Measures shall include but will not be limited to:

- complying with the requirements of the Data Protection Act, and other relevant legislation, the Contractor will record all Complaints, Comments and Queries (correspondence) received during construction. Stored data will be secured against theft, intrusion, or modification by malicious third parties in-line with current best practice;
- the Contractor will record any actions, including further correspondence, taken in respect of any Complaint, Comment or Query;
- the following timescales will apply in the Contractor's management of correspondence following submission:
  - within 8 working hours from receiving the complaint, an acknowledgement will be sent to the correspondent; and

- within 72 hours, the Contractor will issue a response to any correspondence detailing further actions to be undertaken.
- the Contractor will aim to have completed and implemented their actions within seven working days of receiving correspondence.
- the Contractor will have a means by which to explore the Complaints, Comments and Queries interface within the reception area of the site offices, to allow access to the records during normal working hours.

## 2.5 Communication

The Contractor will:

- develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
- display the name and contact details of the person(s) accountable for complaints and/or queries on the site boundary; and
- display the head or regional office contact information.

## 2.6 Site Housekeeping

Good housekeeping is an important part of good environmental practice and helps to maintain a more efficient and safer site. The Site will be tidy, secure, and have clear access routes that are well signposted. The appearance of a tidy, well-managed site can reduce the likelihood of theft, vandalism, complaints and/or specific hazards that could affect the safe operation of the other businesses in the area, such as bird hazards and wind-blown litter.

As outlined in the fourth edition of CIRIA's 'Environmental good practice on site guide' (C741), when considering good housekeeping, the Contractor will implement the following steps:

- adequately plan the site with designated areas of materials and waste storage;
- segregate and label different types of waste as it is produced and arrange frequent removal;
- keep the site tidy and clean;
- ensure that no wind-blown litter or debris leaves the site, use covered skips to prevent wind-blown litter;
- keep hoarding tidy – repair and repaint when necessary, removing any fly posting or graffiti;
- frequently brush-clean wheel washing facilities and keep haul routes clean from site derived materials;
- keep roads free from mud by using a road sweeper; and
- ensure the site is secure.

## 2.7 Traffic Management

A Framework Construction Traffic Management Plan (CTMP) has been produced for the Designated Development and provides a framework document for ensuring work activities in, near or having impact upon the public highway, are undertaken safely and with minimal impact on traffic movement and existing infrastructure throughout the works programme.

During construction, the appointed contractor will ensure that the impacts from construction traffic on the local community (including local residents and businesses and users of the surrounding transport network) are minimised, where reasonably practicable, by implementing the measures set out in the Framework Construction Traffic Management Plan (CTMP).

The Contractor will be required to always accommodate and make provision for access and egress to local residential premises, paying particular attention to the provision of pedestrian/disabled/cyclist safe access and egress. Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footways. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and will be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users including mobility impaired persons

Access to the Designated Development Site during construction for both construction workers and HGV traffic will be via the two existing accesses off the N67 to the southeast and east. The N67 serves the existing Power Station and the Tarbert-Killimer Ferry Terminal. The N67 connects the Site to the N69 Tralee / Limerick Road, located approximately 1.8km to the south. Traffic control will be used to and from the Designated Development Site as required, managed by an allocated member of the construction team.

The majority of construction traffic is expected to be generated between month one and month seven of the Construction Programme of the project. Based on development of a similar nature, it is estimated that there will be up to 15 HGVs arrivals per day (30 two-way movements).

In addition to these trips, there are also expected to be a maximum of 80 HGV arrivals (160 two-way trips) associated with cut and fill movements. These trips will occur during months two and four.

The number of construction workers required during the construction phase is expected to peak at approximately 200 persons. Staff are expected to travel to the Designated Development Site via a combination of carsharing and private passenger vehicles with approximately 50 staff vehicles movements during the peak construction staffing periods.

It is estimated that a number of abnormal load deliveries will be required during the construction phase of the project. The emergency generation plant and equipment will be shipped to Ireland, possibly to Foynes Port in County Limerick, which is to the approximately 28km east of the Designated Development Site and then transported by road via the N69 and N67. This would reduce road traffic where possible. The expected abnormal loads are:

- 3 x gas turbine units;
- 7 x control modules;
- 3 x generator circuit breakers;
- 3 x generators;
- 3 x 30m turbine stacks;
- 2 x Generator Step-up Transformers;
- 1 x raw and fire water storage tank;
- 1 x demineralisation water storage tanks; and
- 3 x liquid fuel storage tanks.

More details on Abnormal Loads are provided in the Framework CTMP, prepared for the Designated Development. A mobile crane is likely to be required on Site for part of the construction works.

The CTMP will consider where deliveries will be made to/from, what roads will be used and will include the scheduling of deliveries to and from the Site. Material deliveries and collections from Site will be planned, scheduled, and staggered to avoid unnecessary build-up of construction works related traffic. HGV trips are anticipated to arrive and depart the Site at a uniform rate throughout the day to avoid pressure on the morning and evening peak hour periods.

The Contractor must distribute the HGV routing plan to all HGV drivers during their induction. It will be a condition of contract between the Applicant and the Contractor to require that all construction HGV deliveries must use the designated routes to access and egress the construction site. Sanctions will be put in place to deal with non-compliance.

The Contractor will erect temporary signage to appropriately direct all HGV traffic relating to the Designated Development (both accessing and egressing the Site). The Contractor will be required to maintain all the HGV route signage.

A full CTMP will be developed by the Contractor prior to the commencement of work on-site. No works shall commence until such time that the full CTMP has been prepared.

## **2.8 Parking Provisions**

Parking demand will vary throughout the construction phase and parking areas will be set aside within the Site to accommodate parking for construction workers. There will be specific on-site parking locations for staff vehicles, separate from construction vehicles and laydown areas. No extraneous parking will take place.

## **2.9 Wheel Cleaning Facility**

In the interests of highway safety, wheel cleaning facilities will be installed at the Site from the start of the construction phase. All HGVs will be required to use the wheel wash prior to exiting the Site.

## **2.10 Road Sweeper**

If required as identified by routine visual inspections, a mechanical 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.

## **2.11 Site Lighting**

Construction works outside daylight hours will be undertaken using adequate site lighting to ensure safe working conditions. Site lighting during construction will be designed to avoid light spill and will be pointed down at a 45-degree angle away from sensitive receptors.

Where temporary construction lighting is required, it will consist of the lowest lumen lighting possible while also maintaining a safe working environment. Lighting will be designed so as not to cause a nuisance outside of the Site in relation to views from residential receptors or light disturbance to ecological receptors.

During the construction phase, any artificial lighting which is required (e.g., for construction works and security purposes) will be directed on to required areas and light spill will be minimised by the use of beam deflectors/cowls/hoods (or similar). When not required, all temporary lighting will be switched off. Light spill onto any notable ecological features which include the watercourses, treelines, hedgerows, and woodlands will be avoided or minimised by the use of cowling.

Lighting will be designed so as not to cause a nuisance outside of the Site in relation to views from residential receptors or light disturbance to ecological receptors. Lighting will be turned off when not in use except to meet the minimum requirements for security and Health and Safety.

Illumination of the Shannon Estuary, the creek to the immediate south of the Designated Development (which is encompassed by the River Shannon and River Fergus Estuaries SPA), and surrounding semi-natural habitats will be avoided during the construction and decommissioning phases in the following ways:

- works within 20m of the Shannon Estuary and the tidal lagoon immediately south of the Designated Development (which may be accessible to fish species from the Shannon Estuary) will not be permitted to take place during hours of darkness;
- elsewhere within the Site, any lighting required during the construction and decommissioning phases will be directional and will be prevented from spilling light onto watercourses or other habitats through the use of cowling.
- any permanent lighting required during the operational phase will be restricted to the absolute minimum required for security and safety purposes. It will be designed using appropriate design software (such as Lighting Reality PRO) so that light levels at the Shannon Estuary and the creek to the immediate south of the Designated Development do not increase from the current baseline by more than 0.2 lux (this being the approximate brightness of a full moon). No direct illumination of the Shannon Estuary or creek to the south of the Designated Development will be permitted.
- the ECoW will be responsible for monitoring compliance with this mitigation and will require that the contractor(s) take corrective action if it is deemed that lighting used for the Designated Development is illuminating the SAC or other habitats which could be used by QI animals (particularly the creek to the south of the Designated Development).

A Lighting Management Plan (LMP) will accompany the Final CEMP which sets out the approach for use of lighting during the construction phase.

## 2.12 Recycling and Disposal of Waste

To control the waste generated during the site preparation and construction phase, the contractor will minimise the creation of waste, maximise the use of recycled materials and assist the collection, separation, sorting, recycling, and recovery of waste arisings, as far as reasonably practicable. The waste hierarchy outlines that waste prevention and minimisation are the priority in managing wastes, followed by waste reuse and recycling, with disposal being considered as a last resort.

A site-specific Resource and Waste Management Plan (RWMP) will be prepared by the Contractor in line with best practice guidelines such as the EPA '*Best Practice Guidelines for the preparation of resource & waste management plans for construction and demolition projects*' 2021. The RWMP will be developed to control construction activities to minimise, as far as reasonably practicable, impacts on the environment and will specify the waste streams to be estimated and monitored and will set goals with regards to the waste produced. A Framework RWMP is included in **Appendix A** of this Framework CEMP.

## 2.13 Best Practice Measures

The Contractor would be encouraged to be a member of the 'Considerate Constructors Scheme' which is an initiative open to all contractors undertaking building work.

Construction industry guidance (e.g., from the Construction Industry Research and Information Association (CIRIA)) will be adopted as far as reasonably practicable to assist in reducing the potential for pollution and nuisance. This will be achieved by employing best practice measures.

## 2.14 Soil Management

Impacts relating to the handling, movement, and temporary storage of soils, will be controlled through the Final CEMP. Measures within the Final /Contractor's CEMP will include:

- a method statement for the works to include soil handling and storage proposals;

- a restoration specification (where applicable); and
- a post-works survey to confirm condition (where applicable).

Soils will be managed in accordance with the DEFRA *Construction Code of Practice for the Sustainable Use of Soil on Development Sites* (DEFRA, 2009) to minimise impacts on soil structure and quality.

The Contractor will develop a Soil Resource Plan (Soil/Sediment Control Plan) in accordance with relevant legislation and guidance. The plan will include information / details on such topics as:

- soil handling procedures, legislation and guidance used;
- good practice and general principles of soil handling;
- methods of stripping, stockpiling and stockpile maintenance, respreading and include an outline of the machinery to be used;
- haul routes to be used;
- the location and content of each soil stockpile;
- schedule of volumes of each material;
- expected after use / disposal of material (in line with all relevant legislation);
- roles and responsibilities including a list of responsible personnel for soil management supervision;
- biosecurity measure to be implemented (if required);
- seasonal working constraints;
- testing of soil conditions;
- importing soil to site;
- transport of soil to and from site.

## **3. Impact Avoidance and Mitigation Measures Implementation Plan**

### **3.1 Overview**

This section sets out the embedded impact avoidance and additional mitigation, enhancement, and management measures to be included as a minimum in the Final CEMP. It also illustrates where additional surveys will be required, either pre-construction or during construction. It describes how the monitoring strategy would be implemented in order to assess the effectiveness of mitigation measures, monitor the impact of construction works and take other actions necessary to enable compliance.

In the Final CEMP, this section will identify the responsible party for each mitigation, enhancement measure or monitoring requirement. As a contractor has not yet been appointed, responsibilities cannot be assigned at this stage.

**Table 3-1: Air Quality**

Potential Impact	Mitigation/Enhancement Measure	Monitoring/ Additional Survey Requirements	Responsibility
<p>There is very little likelihood of significant air quality effects during construction based on the distances to receptors, the activities proposed, and the use of industry standard control measures.</p> <p>In terms of N deposition, the site has no perceptible impacts (&lt;1%) at any SAC or SPA designated habitat.</p>	<p>The Contractor will be required to implement measures to minimise the amount of dust and emissions (including odour) produced during the construction of the Designated Development, including the production of a Dust Management Plan as part of the Final CEMP.</p> <p>Standard industry best practice mitigation measures shall be applied to the Site, for example that described in:</p> <ul style="list-style-type: none"> <li>- 'Control of dust from construction and demolition activities' (Kukadia, V., Upton S., &amp; Hall, D. (2003);</li> <li>- 'Best Practice Guidance: The control of dust and emissions from demolition and construction' (Greater London Authority (GLA) (2006);</li> <li>- 'Guidance on the assessment of dust from demolition and construction', Institute of Air Quality Management (IAQM. (2014); and</li> <li>- 'Guidelines for the Treatment of Air Quality during Planning and Construction of National Roads' (TII. (2011).</li> </ul> <p>Mitigation measures will be undertaken so that construction works are carried out in such a manner that emissions of dust and other pollutants are limited, and that best practicable means are employed to minimise disruption, risks to human health, and to avoid unnecessary impacts on ecological habitats.</p> <p>Air Quality mitigation measures include:</p> <p><b>Communications:</b></p> <ul style="list-style-type: none"> <li>- A Dust Management Plan (DMP) will be prepared, which may include measures to control other emissions. The level of detail will depend on the risk, and should include, as a minimum, the measures in this document.</li> </ul> <p><b>Site Management:</b></p> <ul style="list-style-type: none"> <li>- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner and record the measures taken.</li> <li>- Make the complaints log available to the Applicant when asked.</li> <li>- Record any exceptional incidents that cause dust and / or air emissions, either on or off site and the action taken to resolve the situation in the logbook</li> </ul> <p><b>Preparing and maintaining the Site</b></p> <ul style="list-style-type: none"> <li>- Plan site layout so that machinery and dust causing activities are located away from receptors as far as possible.</li> <li>- Erect solid screens or barriers around dusty activities that are at least as high as any stockpiles on site.</li> <li>- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period, where possible.</li> <li>- Keep site fencing, barriers and scaffolding clean using wet methods.</li> <li>- Remove materials that have a potential to produce dust from site as soon as possible unless being re-used on-site.</li> </ul>	<p>Dust monitoring or recording will be undertaken by the Contractor to an approach agreed with the Applicant.</p> <p>In the event that significant or unacceptable dust effects on receptors arise from an activity – due to dry weather and high winds for example – activities may need to be ceased and additional mitigation measures applied.</p> <p>Monitoring shall include:</p> <ul style="list-style-type: none"> <li>• undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results and make the log available to the local authority when asked;</li> <li>• carry out regular site inspections, record inspection results and make an inspection log available to the local authority when asked</li> <li>• increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions; and</li> <li>• if required, agree dust deposition, dust flux or real-time PM<sub>10</sub> continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks, and construction.</li> </ul>	<p><b>To be confirmed in Final CEMP.</b></p>



Potential Impact	Mitigation/Enhancement Measure	Monitoring/ Additional Survey Requirements	Responsibility
	<ul style="list-style-type: none"> <li>- Cover, seed, or fence stockpiles to prevent wind whipping</li> </ul> <p><b>Operating vehicle / machinery and sustainable travel:</b></p> <ul style="list-style-type: none"> <li>- Ensure all vehicles switch off engines when stationary – no idling vehicles.</li> <li>- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.</li> <li>- Impose and signpost a maximum speed limit of 20km/h on surfaced and 15km/h on unsurfaced haul roads and work area.</li> <li>- Implement a Travel Plan that supports and encourages sustainable travel (car-sharing etc.,).</li> </ul> <p><b>Construction Operations:</b></p> <ul style="list-style-type: none"> <li>- Only use cutting, grinding, or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays.</li> <li>- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation.</li> <li>- Use enclosed chutes and conveyors and covered skips.</li> <li>- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.</li> <li>- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.</li> </ul> <p><b>Waste Management:</b></p> <ul style="list-style-type: none"> <li>- Avoid bonfires and burning of waste materials. No fires will be permitted onsite.</li> </ul> <p><b>Demolition:</b></p> <ul style="list-style-type: none"> <li>- Soft strip inside any buildings before demolition (retaining walls and windows in the building where possible, to provide a screen against dust).</li> <li>- Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.</li> <li>- Avoid explosive blasting, using appropriate manual or mechanical alternatives.</li> <li>- Bag and remove any biological debris or damp down such material before demolition</li> </ul> <p><b>Earthworks:</b></p> <ul style="list-style-type: none"> <li>- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.</li> <li>- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.</li> <li>- Only remove the cover in small areas during work and not all at once.</li> </ul> <p><b>Construction</b></p> <ul style="list-style-type: none"> <li>- Avoid scabbling (roughening of concrete surfaces) if possible.</li> <li>- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.</li> </ul>		

Potential Impact	Mitigation/Enhancement Measure	Monitoring/ Additional Survey Requirements	Responsibility
	<p><b>Track-out</b></p> <ul style="list-style-type: none"><li>- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.</li><li>- Avoid dry sweeping of large areas.</li><li>- Ensure bulk material transporting vehicles entering and leaving sites are covered to prevent escape of materials during transport.</li><li>- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.</li><li>- Record all inspections of haul routes and any subsequent action in a site logbook.</li><li>- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site when reasonably practicable).</li></ul>		

**Table 3-2: Noise and Vibration**

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Additional Survey Requirements	Responsibility
<p>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.</p>	<p>Noise will be minimised through the adoption of best practicable means (BPM) as standard working practices across the Designated Development to ensure that noise is reduced whenever practicable.</p> <p>The following provision, although not exhaustive, will be adhered to where practicable throughout the construction programme:</p> <ul style="list-style-type: none"> <li>• Good community relations to 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.</li> <li>• Fixed and semi-fixed ancillary plant such as generators, compressors, and pumps to be located away from sensitive receptors wherever possible.</li> <li>• All plant used onsite to be regularly maintained, paying attention to the integrity of silencers and acoustic enclosures.</li> <li>• All noise generating construction plant to be shut down when not in use.</li> <li>• The loading and unloading of materials to take place away from residential properties, ideally in locations which are acoustically screened.</li> <li>• Materials to be handled with care and placed rather than dropped where possible. Drop heights of materials from lorries and other plant shall be kept to a minimum.</li> <li>• Modern plant to be selected which complies with the latest European Commission noise emission requirements<sup>3</sup>. Electrical plant items (as opposed to diesel powered plant items) to be used wherever practicable. All major compressors to be low noise models fitted with properly lined and sealed acoustic covers. All ancillary pneumatic percussive tools to be fitted with mufflers or silencers of the type recommended by the manufacturers.</li> <li>• Site operations and vehicle routes to be organised to minimise the need for reversing movements, and to take advantage of any natural acoustic screening present in the surrounding topography.</li> <li>• No employees, subcontractors and persons employed on the site to 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 to include information on minimising noise and reminding them to be considerate of the nearby residents.</li> <li>• As far as practicable, noisier activities to be planned to take place during periods of the day which are generally considered to be less noise sensitive <i>i.e.</i>, not particularly early, or late in the day.</li> <li>• Measures to be put in place to ensure that employees know that minimisation of noise will be important at the site; and</li> </ul>	<p>To be confirmed in the Final CEMP.</p> <p>Undertake daily on-site inspections, record inspection results and make the log available to the Applicant when asked.</p> <p>The Final CEMP will set out a scheme for the provision of information to the relevant planning authority and local residents to advise of potential noisy works that are due to take place and for monitoring of noise complaints and reporting to the Applicant for immediate investigation and action.</p> <p>Increase the frequency of site inspections by the person accountable for noise issues on site when activities with high noise levels are being carried out.</p> <p>When activities with high noise levels are anticipated, construction noise level monitoring will be undertaken to check compliance.</p>	<p><b>To be confirmed in final CEMP.</b></p>
<p>Potential noise and vibration sources during the construction phase comprise mobile plant and construction processes such as earthworks which can give rise to elevated sound and vibration levels.</p>			
<p>No significant effects are predicted based on the application of appropriate control measures.</p>			

<sup>3</sup> [Noise emission by outdoor equipment \(europa.eu\)](http://europa.eu)

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Additional Survey Requirements	Responsibility
	<ul style="list-style-type: none"> <li>It will be ensured that construction traffic from this and other concurrent developments will be coordinated to minimise traffic and site noise impacts where possible</li> </ul> <p>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.</p> <p><b>General</b></p> <ul style="list-style-type: none"> <li>Contractors will be made aware of the following guidance:                             <ul style="list-style-type: none"> <li>BS 5228 Code of practice for noise and vibration control on construction and open sites: Part 1 Noise and Part 2 Vibration;</li> <li>NR/L2/ENV/015 Environment and Social Minimum Requirements for Projects – Design and Construction; and</li> <li>NR/L2/ENV/121 Managing environmental and social impact of noise and vibration.</li> </ul> </li> <li>Loading and unloading of vehicles, dismantling of site equipment such as scaffolding or moving equipment or materials within the Designated Development Site to be conducted in such a manner as to minimise noise generation, as far as reasonably practicable.</li> <li>Appropriate routing of construction traffic on public roads and along access tracks, to reduce construction traffic noise, as far as reasonably practicable.</li> <li>No part of the works nor any maintenance of plant will be carried out in such a manner as to cause unnecessary noise except in the case of an emergency when the work is absolutely necessary for the saving of life or property or the safety of the works.</li> <li>Construction activities taking place during night-time hours will need to be planned, managed, and controlled appropriately so they do not give rise to elevated noise and vibration levels off-site.</li> </ul> <p>The selected Contractor will be encouraged to be a member of the 'Considerate Constructors Scheme'.</p> <p><b>Vehicles, Mechanical Plant and Machinery</b></p> <ul style="list-style-type: none"> <li>modern plant shall be selected which complies with the latest European Commission noise emission requirements. Electrical plant items (as opposed to diesel powered plant items) shall be used wherever practicable. All major compressors shall be low noise models fitted with properly lined and sealed acoustic covers. All ancillary pneumatic percussive tools would be fitted with mufflers or silencers of the type recommended by the manufacturers;</li> <li>vehicles, plant, and mechanical plant used for the purpose of the works will be fitted with effective exhaust silencers, and all parts of such vehicles, plant or machinery shall be maintained in good and efficient working order and operated in such a manner as to minimise noise emissions. The contractor will ensure that all plant complies with the relevant statutory requirements and is used and maintained in accordance with manufacturer's recommendations;</li> <li>machines in intermittent use will be shut down or throttled down to a minimum when not in use. Vehicles shall not remain stationary on the Designated Development Site with engines running;</li> </ul>		

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Additional Survey Requirements	Responsibility
	<ul style="list-style-type: none"> <li>• pneumatic percussive tools will be fitted with mufflers or silencers of the type recommended by the manufacturers;</li> <li>• all compressors and generators shall be “sound reduced” models fitted with properly lined and sealed acoustic covers or enclosures, which shall remain closed whenever the machines are in use;</li> <li>• hydraulic techniques for breaking / equipment which breaks concrete, brickwork, or masonry by bending, bursting, or “nibbling” will be used in preference to percussive tools. Where possible, the use of impact tools will be avoided close to sensitive receptors;</li> <li>• wherever possible, equipment powered by mains electricity will be used in preference to equipment powered by internal combustion engine or locally generated electricity;</li> <li>• vehicles associated with works shall not wait or queue on the public highway;</li> <li>• ensure that modern plant is used, complying with applicable best practice noise emission requirements, and selection of inherently quiet plant where possible;</li> </ul> <p><b>Inductions and Toolbox Talks</b></p> <ul style="list-style-type: none"> <li>• careful handling of tools/equipment, placement and handling of materials, and control of raised voices on site shall be covered in activity plans, briefings and ‘Toolbox Talks’ as appropriate;</li> <li>• site inductions and ‘Toolbox Talks’ shall be delivered to the site personnel to inform them of noise and vibration issues and the location of nearby receptors;</li> <li>• all site personnel will be instructed on Best Practicable Means (‘BPM’) measures to limit noise and vibration as part of their induction training and as required prior to specific work activities;</li> </ul> <p><b>Monitoring and Inspections</b></p> <ul style="list-style-type: none"> <li>• the contractor shall carry out regular site inspections, specialist BPM checks, random senior management tours and unannounced audits to assess whether noise levels are acceptable and take steps to reduce them and to ensure all BPM mitigation measures have been implemented as required;</li> <li>• any noncompliance will be documented and reported remediation actions taken immediately;</li> <li>• the implementation of noise and vibration monitoring and abiding by agreed construction noise limits at locations is to be agreed with the relevant planning authority;</li> <li>• the contractor shall ensure that processes are in place to minimise noise before works begin and ensuring that best practicable means (BPM) are being achieved throughout the construction programme, including the use of localised screening around significant noise producing plant and activities;</li> <li>• off-site pre-fabrication for components of the Designated Development, where reasonably practicable;</li> </ul> <p><b>Complaints</b></p> <ul style="list-style-type: none"> <li>• a site representative and designated noise liaison responsible for matters relating to noise and vibration shall be appointed prior to construction onsite, the role shall include the provision of information to the</li> </ul>		

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Additional Survey Requirements	Responsibility
	<p>relevant planning authority and local residents especially occupiers of sensitive receptors regarding construction works and provide advance notice of potential noisy works that are due to take place ;</p> <ul style="list-style-type: none"> <li>the relevant planning authority and local residents especially occupiers of sensitive receptors shall be provided with contact details for the person to whom any questions or complaints should be directed;</li> <li>Any complaints will be logged, investigated immediately, and followed up in a prompt fashion and, where required, measures taken to ameliorate the source of the noise complaint. Noise complaints shall be reported to the Applicant;</li> <li>good community relations shall be established and maintained throughout the construction process. Regular communication with the local community throughout the construction period will take place to publicise the works schedule, giving notification to residents regarding periods when higher levels of noise may occur during specific operations, and providing lines of communication where complaints can be addressed.</li> </ul> <p><b>Piling</b></p> <ul style="list-style-type: none"> <li>mitigation measures to be implemented where piling occurs may include, but not limited to, use of a temporary acoustic barrier, use of a partial enclosure around hammer, and the use of a non-metallic dolly between the hammer and the driving helmet (for driven piling) to prevent metal on metal impact sound;</li> <li>use of lower noise piling (e.g., rotary bored or hydraulic jacking) rather than driven piling techniques, where reasonably practicable;</li> <li>a soft-start or slow ramp-up of piling hammer power will be employed at the commencement of any impact piling activity or after a break of more than 10 minutes;</li> <li>should piling take place at locations close to, the Lower River Shannon SAC, River Shannon and River Fergus Estuaries SPA, vibration impacts on ecological receptors would be minimised by applying mitigation measures as outlined within the ER prepared for the Designated Development and by adhering to the Joint Nature Conservation Commission (JNCC) best-practice measures for piling including the implementation of a soft-start process and avoidance of night-time piling, thereby offering marine ecological receptors respite from any disturbance;</li> <li>piling within 20m of the Shannon Estuary and the creek to the south of the Designated Development will not be permitted during the migratory seasons for Atlantic salmon and lamprey species, these being:                         <ul style="list-style-type: none"> <li>Atlantic salmon – March to August;</li> <li>brook lamprey – April to June (according to NatureScot (<a href="https://www.nature.scot/plants-animals-and-fungi/fish/freshwater-fish/lamprey">https://www.nature.scot/plants-animals-and-fungi/fish/freshwater-fish/lamprey</a>));</li> <li>river lamprey – October to December and July to September (Maitland, 2003); and,</li> <li>sea lamprey – April to May (Maitland, 2003).</li> </ul> </li> <li>On the basis of the above, piling within 20m of the Shannon Estuary and the creek to the south of the Designated Development will only be permitted in September, January, or February.</li> </ul>		

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Additional Survey Requirements	Responsibility
	<p>The 20m buffer distance will be measured from the edge of the water, which may change with tidal state, meaning that some locations may be piled within the migratory seasons, but only at certain times within the tidal cycle (i.e., when water levels drop to be more than 20m away from relevant piling location).</p> <p>Additional measures to minimise environmental impacts would include:</p> <ul style="list-style-type: none"><li>• adoption of the Joint Nature Conservation Commission (JNCC) best-practice measures for piling including the implementation of a soft-start process;</li><li>• avoidance of night-time piling;</li><li>• use of silt curtains (to minimise impacts on water quality).</li></ul> <p>Further mitigation measures in relation to piling to be adhered to onsite are detailed within the Biodiversity section of this CEMP.</p> <p>Regular communication with the local community throughout the piling process will also serve to publicise the works schedule, giving notification to residents regarding periods when perceptible levels of vibration may occur during specific operations, reassuring that these levels are significantly below the levels at which building damage may occur and providing lines of communication should complaints arise.</p> <p>Measures would therefore be put in place to control or restrict activities during evenings/ night-time so as not to exceed the relevant noise limit at locations to be agreed with the relevant planning authority.</p>		

**Table 3-3: Biodiversity**

Potential Impact	Mitigation / Enhancement Measure	Monitoring / Additional Survey Requirements	Responsibility
<p>Potentially the most significant ecological constraint to the Designated Development is the Site's location immediately adjacent to the Shannon Estuary and namely the River Shannon and River Fergus Estuaries SPA and Lower River Shannon SAC designations. Whilst there will be no direct effects (loss or damage to designated habitats or features) upon the SPA or SAC (the Designated Development boundary is separated by an existing fence line which will be retained), indirect effects upon the designated features (habitats and species) could occur.</p>	<p>Mitigation measures detailed in the CEMP, ER, and NIS will be implemented in full in order to address potential effects upon biodiversity including SPA and SAC qualifying species.</p> <p><b>The Appointed Ecologist / Ecological Clerk of Works</b></p> <p>An Appointed Ecologist / Ecological Clerk of Works (ECoW) will be employed on a full-time basis for the duration of the construction and decommissioning of the Designated Development. The ECoW will be responsible for monitoring and ensuring the implementation of all mitigation measures and compliance with legislative requirements in relation to ecological features. The ECoW will also carry out pre-works checks for protected species, as necessary;</p> <p>The Appointed Ecologist / ECoW will be responsible for:</p> <ul style="list-style-type: none"> <li>• advising the Applicant on ecological matters and requirements for compliance with relevant legislation and protected species licences, providing support as instructed, and monitoring compliance with the mitigation measures outlined within the NIS, ER, CEMP and any planning commitments;</li> <li>• reviewing the CEMP at appropriate intervals and revising management requirements as necessary for the duration of the CEMP implementation;</li> <li>• providing the Applicant with survey reports and other written evidence required in accordance with the agreed scope of work and contractual obligations.</li> <li>• supervising and managing the implementation of measures to mitigate impacts on ecological features, including protected species, prior to and during the construction phase. This will encompass both licensed and relevant unlicensed activities;</li> <li>• supervising vegetation clearance and construction excavations, supervising all relevant works to provide guidance on the measures required day-to-day to deliver legislative compliance; and</li> <li>• ensuring all site workers are briefed on the ecological risks present and ecological sensitivities of the Designated Development Site and its environs through 'Toolbox Talks' and provision of clear information about protected species and restricted areas and activities. Toolbox Talks shall also cover legal requirements and working arrangements necessary to comply with legislation. All staff (including sub-contractors) will receive regular updated talks and briefings. Toolbox Talks will be repeated as necessary over the duration of the relevant works.</li> </ul>	<p>Any additional surveys will be instructed during the advance works, site clearance and construction phases as identified as necessary by the ecologist.</p>	<p><b>Roles and responsibilities shall be confirmed in final CEMP.</b></p>
<p>River Shannon and River Fergus Estuaries SPA.</p>			
<p>Loss of functionally linked habitat (habitat which could support SPA SCI species)</p>			
<p>Indirect effects upon SAC designated habitats, due to air or waterborne pollution; changes in hydrological conditions (quantity and quality).</p>	<p><b>The Applicant and/ or the Appointed Main Contractor</b></p> <p>The Applicant and/ or appointed main contractor will be responsible for:</p>		
<p>Loss and disturbance to habitats within the Site.</p>	<ul style="list-style-type: none"> <li>• correct instruction of all parties contributing to delivery of the final approved CEMP;</li> <li>• compliance with the final approved CEMP, relevant legislation, and any relevant planning commitments;</li> <li>• keeping the appointed ecologist/ ECoW/ landscape architect/ arboriculturist informed of work activities that require support and supervision, so that it is clear when attendance on-site is required;</li> <li>• enacting/ enforcing recommendations made by the ecologist/ ECoW/ landscape architect/ arboriculturist, or otherwise agreeing an appropriate alternative course of action, if it is subsequently determined that previous advice is not practicable or is out of date; and</li> <li>• keeping a record of measures taken to deliver the requirements of the final CEMP, to provide an auditable record of compliance.</li> </ul>		
<p>Disturbance effects upon SCI/protected/notable species from increased/changes to noise, lighting or changes in site conditions influencing species movements/dispersal/foraging.</p>			



Potential Impact	Mitigation / Enhancement Measure	Monitoring / Additional Survey Requirements	Responsibility
<p>No significant effects are predicted based on the application of appropriate control measures.</p>	<p><b>Mitigation Measures</b></p> <ul style="list-style-type: none"> <li>• a Final CEMP will be prepared by the Contractor for approval by the relevant planning authority, prior to commencement of construction works associated with the Designated Development. The Contractor CEMP will include works specific method statements prepared in association with the Appointed Ecologist/Ecological Clerk of Works (ECoW). Works will not start without agreed method statements in place. The final CEMP will set out the measures to be implemented to ensure there is no pollution of watercourses, waterbodies, or terrestrial habitats, in accordance with guidelines such as Construction Industry Research and Information Association's (CIRIA) Control of water pollution from construction sites (CIRIA, 2001) and Environmental good practice on site guide (CIRIA, 2015), and the EPA's Best practice guidelines for the preparation of resource &amp; waste management plans for construction &amp; demolition projects (EPA, 2021);</li> <li>• updated ecological surveys would be completed prior to the start of construction, where necessary, to gain up to date information on relevant protected or notable species. This would be required to determine appropriate mitigation requirements inform and to protected species licence applications (where necessary);</li> <li>• the Contractor will consult and comply with the requirements of National Parks and Wildlife Service (NPWS) with respect to any sites or species protected by law, which are likely to be affected by the construction, establishment, and maintenance of the Designated Development;</li> <li>• there will be no works directly within the boundary of any European site;</li> <li>• the Contractor will be responsible for obtaining any relevant construction phase licences required for protected species;</li> <li>• the Contractor will comply with requirements of The Wildlife Acts of 1976 and 2012 as amended ("The Wildlife Act") and the Flora (Protection) Order, 2022 when undertaking any works which will affect protected species;</li> <li>• in accordance with the requirements of The Wildlife Act, no works will be undertaken to any habitat (including buildings) in which any birds may be nesting without prior surveys being undertaken;</li> <li>• during the works, the Contractor will provide a fence between the Designated Development Site including the temporary construction area, laydown areas and the adjacent areas. This will limit construction works within the confines of the Designated Development Site;</li> <li>• the temporary construction compound area has been sited on an area of existing hard-standing within the centre of the existing Tarbert Power Station facility. Existing roads and access routes will be used. This avoids the loss of semi-natural habitats and minimises potential for disturbance of QI / SCI species;</li> <li>• the majority of the components of the new power generation units are modular and will be delivered to the Designated Development Site pre-assembled. This minimises the length of time required for construction;</li> <li>• all watercourses will be protected. All refuelling and servicing of vehicles and plant will be carried out in a designated area which is bunded and has an impermeable base, situated at least 50m from any watercourse and the boundary of any European site;</li> <li>• appropriate measures will be used to limit silt mobilisation and potential for scour, if appropriate.</li> </ul> <p><b>Demarcation of European sites</b></p> <ul style="list-style-type: none"> <li>• there will be no works directly within the boundary of any European site. The River Shannon and River Fergus Estuaries SPA and Lower River Shannon SAC are separated from the Designated Development</li> </ul>		

Potential Impact	Mitigation / Enhancement Measure	Monitoring / Additional Survey Requirements	Responsibility
	<p>by existing fence lines. The boundary of the River Shannon and River Fergus Estuaries SPA and the Lower River Shannon SAC will be clearly demarcated during the construction, operational and decommissioning phases of the Designated Development by the presence of these existing fence lines. These fences will be retained during construction, operation and decommissioning, and signage will be erected on the fencing to notify all staff that no access beyond the fence is permitted;</p> <ul style="list-style-type: none"> <li>all personnel involved in the construction, operation and/or decommissioning of the Designated Development will be made aware of the presence of these sites. This will prevent any encroachment into the European sites which could cause damage to QI habitats and/or habitats which support QI / SCI species;</li> </ul> <p><b>Pollution Prevention</b></p> <p>The following pollution prevention measures will be implemented:</p> <ul style="list-style-type: none"> <li>controls and contingency measures to manage run-off from works areas and to manage sediment, including the use of sediment fencing, sediment traps and other drainage measures;</li> <li>all oils, lubricants, or other chemicals to be stored in an appropriate secure container in a suitable storage area within one of the construction compounds in the Site, with spill kits provided at the storage location and at suitable places across the Designated Development Site;</li> <li>in order to avoid potential pollution impacts to soils, vegetation and watercourses / waterbodies, all refuelling and servicing of vehicles and plant will be carried out in a designated area which is bunded and has an impermeable base, situated at least 50m from any watercourse and the boundary of any European site. This will also apply at the operational phase, when deliveries of liquid fuel will be carried out in a specific location, which is impermeable and bunded, and located at least 50m from any watercourse and the boundary of any European site. The bund will be sufficient to contain at least 110% of the total volume of a delivery lorry;</li> <li>any spillages of distillate fuel during delivery / transfer will be managed. This includes the provision for a licensed contractor to respond to any emergency and with capabilities to collect and safely dispose of any spilled fuel;</li> <li>dust suppression techniques will be adopted during construction and decommissioning works to prevent emissions of dust from the movement of vehicles / plant, or from other construction / demolition activities. This could involve spraying access tracks and other areas of hard-standing (as required) with clean water (also see Air Quality mitigation measures);</li> <li>concrete will be delivered to the Designated Development Site ready-mixed in trucks but there will also be on-site batching. On-site batching will be undertaken on an impermeable base at least 30 m from the Shannon Estuary and pollution control measures will be implemented. Concrete pours will take place outside periods when heavy rainfall is forecast. Where washout of concrete transporting vehicles chutes occurs, this will occur in a designated carefully managed onsite wash out location prior to leaving the Designated Development Site. The wash-down location will be self-contained and will allow for concrete to be removed from the water, prior to disposal. Only the chutes of vehicles shall be rinsed on site;</li> <li>wastewater from washing of concrete lorry chutes shall be directed into a concrete washout container, lined with an impermeable membrane. The container should be of good condition, should not overflow or leak and should be easily accessible to vehicles. The containers must be checked and emptied at a frequency equivalent to the volume of concrete being used and no runoff should leave the washout location. The area must be clearly marked and must be located away from storm drain inlets, open drainage</li> </ul>		

Potential Impact	Mitigation / Enhancement Measure	Monitoring / Additional Survey Requirements	Responsibility
	<p>facilities, watercourses &amp; ditches. Direct discharge of wash water to ground or surface waters shall be strictly prohibited;</p> <ul style="list-style-type: none"> <li>all personnel and staff involved in the construction, operation and decommissioning of the Designated Development will be made aware of the presence of ecological features (including the QI / SCI features of European sites) in the vicinity of the Designated Development and the mitigation measures and working procedures which must be adopted. This will be achieved as part of the induction process through the delivery of a Toolbox Talk. In addition, as required, briefings will also be provided in advance of works which are considered to present an increased pollution risk and/or risk of impacting ecological features;</li> <li>construction works will take place only within the red line boundary of the Designated Development Site;</li> </ul> <p><b>Lighting</b></p> <p>Illumination of the Shannon Estuary, the creek to the immediate south of the Designated Development (which is encompassed by the River Shannon and River Fergus Estuaries SPA), and surrounding semi-natural habitats will be avoided during the construction and decommissioning phases in the following ways:</p> <ul style="list-style-type: none"> <li>works within 20 m of the Shannon Estuary and the creek immediately south of the Designated Development (which may be accessible to fish species from the Shannon Estuary) will not be permitted to take place during hours of darkness;</li> <li>elsewhere within the Designated Development Site, any lighting required during the construction and decommissioning phases will be directional and will be prevented from spilling light onto watercourses or other habitats through the use of cowling;</li> <li>Any permanent lighting required during the operational phase will be restricted to the absolute minimum required for security and safety purposes. It will be designed using appropriate design software (such as Lighting Reality PRO) so that light levels at the Shannon Estuary and the creek to the immediate south of the Designated Development do not increase from the current baseline by more than 0.2 lux (this being the approximate brightness of a full moon). No direct illumination of the Shannon Estuary or creek to the south of the Designated Development will be permitted;</li> <li>The ECoW will be responsible for monitoring compliance with this mitigation and will require that the contractor(s) take corrective action if it is deemed that lighting used for the Designated Development is illuminating the SAC or other habitats which could be used by QI animals (particularly the creek to the south of the Designated Development);</li> </ul> <p><b>Habitat Restoration/ Reinstatement</b></p> <ul style="list-style-type: none"> <li>any habitats disturbed during construction will be reinstated on a like-for-like basis at the same location following construction;</li> </ul> <p><b>Breeding/Nesting Birds</b></p> <p>The following approach would be taken to deliver legislative compliance in relation to nesting birds:</p> <ul style="list-style-type: none"> <li>in accordance with the requirements of The Wildlife Act, no works will be undertaken to any structure which any birds may be nesting;</li> <li>any necessary vegetation clearance, which has been identified as minimal following site visits, will, if possible, occur outside the bird-breeding/ nesting season (i.e., undertaken between September and February inclusive) and will be preceded by a check by an ornithologist, especially for the potential presence of early or late nesting species;</li> </ul>		

Potential Impact	Mitigation / Enhancement Measure	Monitoring / Additional Survey Requirements	Responsibility
	<ul style="list-style-type: none"> <li>• if clearance cannot be undertaken outside of the breeding bird season, then the Designated Development Site will be checked for breeding birds by an ornithologist immediately before clearance and/or works commence. If active nests are discovered through this process, the ornithologist will advise on appropriate mitigation to ensure that these are not impacted by construction activities. All relevant works will be completed in accordance with this advice and under the supervision of the ornithologist. Any identified active nests will be left until the hatchlings have fledged;</li> <li>• for reference, the breeding bird season is generally taken as the 1st March until 31st August inclusive. However, it is also noted that birds can nest at any time of the year and are therefore protected when they do;</li> <li>• the Contractor's programme will clearly indicate any vegetation to be removed, site clearance, and their programmed schedule for removal;</li> <li>• where there would be a gap in activity between site clearance/ soil stripping and the start of construction, then all cleared ground would be maintained in a disturbed state (e.g., through regular harrowing) to minimise the risk of ground nesting birds establishing in the lead into construction;</li> <li>• all cleared material of bird nesting potential will be moved and stored off-site to ensure that birds do not use the cleared material for nesting during the bird breeding season. Similarly, stockpiles of earth (particularly sandy material) will be left without vertical faces during the spring and summer period; and</li> <li>• should bird species of qualifying Interest and/or Species of Conservation Interest be present at the time of construction (to be determined through pre-commencement surveys) the ECoW will advise on species-specific requirements to achieve legislative compliance.</li> </ul>		
	<p><b>Otters, Badger, Other Mammals and Animal Welfare during Construction</b></p>		
	<ul style="list-style-type: none"> <li>• a pre-works survey for otter will be carried out prior to the commencement of construction or decommissioning works, the pre-works survey shall include any potential laydown areas immediately adjacent to the River Shannon;</li> <li>• a badger survey will be completed in advance of construction works to identify the status and distribution of badgers. Mitigation requirements will be reviewed and confirmed based on this badger survey;</li> <li>• construction works will take place within a clearly demarcated area and a buffer zone to the River Shannon will be incorporated to ensure no encroachment into riparian habitat;</li> <li>• all excavations will be covered or fenced overnight, or where this is not practicable, a means of escape will be fitted e.g., battered soil slope or scaffold plank, to provide an escape route should any animals (e.g., reptiles, badger, otter, brown hare, hedgehog) that may stray into the construction site to vacate excavations, should they fall in;</li> <li>• excavations will be checked at the start of each working day to ensure no animals are trapped within them;</li> <li>• any pipes will be capped or otherwise blocked at the end of each working day, or if left for extended periods of time, to ensure no animals become trapped;</li> <li>• within the Designated Development Site, all vehicles will be restricted to a maximum speed of 20 km per hour. This will help to minimise the risk of collision with mammals, including otter;</li> <li>• mammal/ badger gates will be installed in boundary fences as appropriate to maintain access for nocturnal wildlife into and through the habitat;</li> </ul>		

Potential Impact	Mitigation / Enhancement Measure	Monitoring / Additional Survey Requirements	Responsibility
	<ul style="list-style-type: none"> <li>construction compounds will be fenced to prevent encroachment of personnel, machinery, and materials onto adjacent habitats. The temporary stockpiling of materials will be restricted to locations on the Site away from site boundaries, drainage infrastructure and watercourses.</li> </ul> <p><b>Invasive Species Management Plan (ISMP)</b></p> <p>An Invasive Non-Native Species (INNS) survey will be undertaken prior to construction to determine if INNS are present onsite. If determined as necessary through this survey and after consideration of other available INNS data, an ISMP will be prepared to accompany the final CEMP and would be agreed with relevant stakeholders. The ISMP will specify the measures and supervision necessary during construction to prevent the spread of plant and animal INNS to new locations. The ISMP will specify the control/ eradication (as reasonable and practicable), biosecurity measures and supervision necessary during construction to prevent the spread of plant and animal INNS to new locations.</p> <p>Biosecurity management measures will ensure that there will be no spread of INNS during the construction or decommissioning of the Designated Development. Biosecurity requirements will address all potential pathways for interaction with and dispersal of INNS, including movements of vehicles, machinery, and staff:</p> <ul style="list-style-type: none"> <li>into the Designated Development Site from third party locations, e.g., during construction mobilisation;</li> <li>between different parts within the Designated Development Site (also taking into consideration adjacent watercourses); and</li> <li>from the Designated Development Site for redeployment elsewhere.</li> </ul> <p>The following measures may be required depending on the presence of INNS within the Designated Development Site:</p> <ul style="list-style-type: none"> <li>as far as possible, any stands of invasive non-native plants present within the Designated Development Site will be demarcated and entirely avoided;</li> <li>where this cannot be achieved, the species will be subject to appropriate treatment and/or management. This may include herbicide application, coupled with on-site burial or off-site disposal to a suitably licensed landfill;</li> <li>the provision of washdown facilities shall be provided for any personnel, plant or other equipment involved in works within an area potentially infested by an INNS;</li> <li>the implementation of measures will be monitored by the ECoW.</li> </ul> <p><b>Tree Works</b></p> <ul style="list-style-type: none"> <li>where works in close proximity to retained trees cannot be practicably avoided, these works will be undertaken in accordance with current best practice, such as that defined in British Standard (BS) 5837: 2012 Trees in relation to design, demolition and construction – Recommendations (British Standards Institute, 2012), National Joint Utilities Group (NJUG) Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (NJUG, 2007) and Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes;</li> <li>all necessary protective fencing will be installed prior to the commencement of site clearance or construction works. Fencing will be erected at a sufficient distance from the tree so as to enclose the Root Protection Area (RPA) of the tree. The RPA will be defined based upon the recommendation of a qualified</li> </ul>		

Potential Impact	Mitigation / Enhancement Measure	Monitoring / Additional Survey Requirements	Responsibility
	<p>arborist. The area within the RPA will not be used for vehicle parking or the storage of materials (including soils, oils, and chemicals).</p> <ul style="list-style-type: none"> <li>Also see relevant mitigation measures set out above for Breeding/Nesting Birds.</li> </ul> <p><b>Piling</b></p> <p>A piling risk assessment shall be completed ahead of piling works. Piling within 20m of the Shannon Estuary and the creek to the south of the Designated Development will not be permitted during the migratory seasons for Atlantic salmon and lamprey species, these being:</p> <ul style="list-style-type: none"> <li>Atlantic salmon – March to August;</li> <li>brook lamprey – April to June (according to NatureScot (<a href="https://www.nature.scot/plants-animals-and-fungi/fish/freshwater-fish/lamprey">https://www.nature.scot/plants-animals-and-fungi/fish/freshwater-fish/lamprey</a>));</li> <li>river lamprey – October to December and July to September (Maitland, 2003); and,</li> <li>sea lamprey – April to May (Maitland, 2003).</li> </ul> <p>On the basis of the above, piling within 20m of the Shannon Estuary and the creek to the south of the Designated Development will only be permitted in September, January, or February.</p> <p>The 20m buffer distance will be measured from the edge of the water, which may change with tidal state, meaning that some locations may be piled within the migratory seasons, but only at certain times within the tidal cycle (i.e., when water levels drop to be more than 20m away from relevant piling location).</p> <p>The JNCC best-practice measures for piling will be adopted, including the implementation of a soft-start process and avoidance of night-time piling. In addition, a seasonal restriction will be adopted to minimise disturbance to sensitive fish species.</p> <p>A range of other working practices and restrictions will be adopted to mitigate the potential for disturbance of QI / SCI species including:</p> <ul style="list-style-type: none"> <li>BPM techniques will be adopted including 'soft-start' techniques, these will be employed during construction / decommissioning works:                             <ul style="list-style-type: none"> <li>the required machines for each working day will be started gradually and not all at once, with starting of machines to be staggered over a period of 15-30 minutes, for example during daily safety briefings at the start of each working day;</li> <li>machines will be brought to full throttle / speed gradually and not suddenly;</li> <li>machines will be throttled down or switched off when not required.</li> </ul> </li> <li>the loudest activities (e.g., piling) will not start early in the day or late in the day (i.e., they will not start until at least one hour after sunrise and will cease not later than one hour prior to sunset). Lamprey species typically migrate in darkness, so this restriction will benefit them particularly;</li> <li>during periods of particularly inclement weather, the loudest activities (in particular piling) will not be carried out. The approach to be taken will be based on the 'Scheme to reduce disturbance to waterfowl during severe winter weather' promoted by the UK Joint Nature Conservation Committee (JNCC), which specifically relates to the measures adopted during the shooting season for waterbirds (<a href="https://jncc.gov.uk/our-work/severe-weather-scheme/">https://jncc.gov.uk/our-work/severe-weather-scheme/</a>) but the principals of which are applicable;</li> <li>an on-site weather station will be used to monitor temperature during the autumn, winter, and spring periods (as a minimum). Should freezing conditions be recorded for a period of seven consecutive days, piling works will be suspended for a period of seven days, or longer if freezing conditions persist. Where</li> </ul>		

Potential Impact	Mitigation / Enhancement Measure	Monitoring / Additional Survey Requirements	Responsibility
	<p>one or two days of temperatures above freezing are recorded within the seven day period this would not have an effect on the process of triggering a suspension of noisy works. Only if three days of above-freezing temperatures are recorded within the seven day period will works be permitted to continue. The implementation of this process will be closely monitored by the contractor;</p> <ul style="list-style-type: none"> <li>• an acoustic barrier, of a minimum of 4m height, will be installed along the edge of the southern and western perimeters of the Site for the construction and decommissioning phases. This will be installed so as to ensure no gaps between joints or the ground and will be inspected and maintained throughout the periods that works are taking place. This barrier will reduce noise levels experienced by birds and other animals within the River Shannon and River Fergus Estuaries SPA and Lower River Shannon SAC;</li> <li>• the acoustic barrier installed around sections of the Designated Development Site will also serve a second purpose in providing visual screening of works during the construction and decommissioning phase. Being a minimum of 4m high, it will screen all personnel and all but the largest plant from birds and other animals in the adjacent European sites;</li> <li>• guidance published by Transport Infrastructure Ireland (TII, formerly the National Roads Authority (NRA)) recommends that a buffer of 150 m should be applied around piling works and otter breeding holts (NRA, 2008).</li> </ul>		

**Table 3-4: Population and Human Health**

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Additional Survey Requirements	Responsibility
<p>Employment opportunities will be created as a result of the works. These will be temporary, but it is considered that there is sufficient accommodation capacity in the local area.</p> <p>The construction phase traffic will lead to an increase in the number of vehicles using the main junctions through the town of Tarbert onto the N67, however, the increase is not expected to lead to junctions in the area becoming over capacity, therefore congestion is not expected to become an issue, therefore a negligible impact is expected.</p> <p>The Designated Development has the potential to impact human health as a result of changes in local air quality, climate, and noise, during the construction phase. However, no significant impacts are predicted.</p> <p>No significant effects are predicted based on the application of appropriate control measures.</p>	<p>The Contractor will be responsible for the security of the Site and will be required to:</p> <ul style="list-style-type: none"> <li>- Install adequate Site hoarding to the Site boundary;</li> <li>- Maintain Site security staff at all times;</li> <li>- Ensure restricted access is maintained to the works;</li> <li>- Operate a Site induction process for all Site staff;</li> <li>- Ensure all Site staff shall have current 'safe pass' cards; and</li> <li>- Separate pedestrian access from construction at the main Site entrances provide a safe walkway for pedestrians along the site entrances.</li> </ul> <p>The Contractor will establish communications with local community representatives throughout the construction period.</p>	<p>To be confirmed in the Final CEMP.</p>	<p><b>To be confirmed in the Final CEMP.</b></p>



**Table 3-5: Land and Soils**

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Requirements	Additional Survey Responsibility
<p>The construction phase of the Designated Development has the potential to result in different types and durations of impact on soils and geological receptors. These are:</p> <ul style="list-style-type: none"> <li>• Temporary impacts on soil structure as a result of soil excavation, smearing and compaction;</li> <li>• Temporary impacts on soil chemistry as a result of spillages of oils, fuels, or other construction chemicals, or through the mobilisation of existing contamination following ground disturbance;</li> <li>• Impacts on surface and groundwater water quality due to deposition or spillage of soils, sediments, oils, fuels, or other construction chemicals/ wastewater, or through mobilisation of contamination following disturbance of contaminated ground, sediments, or groundwater, or through uncontrolled site runoff;</li> <li>• Potential increase in volume and rate of surface water runoff from new impervious areas during construction, leading to an impact on flood risk;</li> <li>• Increased risk of groundwater flooding or recharge as a result of any below ground excavations;</li> </ul>	<p>Mitigation measures within the Water section of this CEMP (see Table 3-6) are also relevant for the protection of land and soils during the construction phase activities and should be read in conjunction with the mitigation measures detailed.</p> <p>To minimise the potential for adverse impacts to soil structure and quality, the following is an outline of the general mitigation measures that will be in place:</p> <ul style="list-style-type: none"> <li>– Soil material will be stored temporarily within the Site in managed stockpiles that will not be allowed to dry out, to avoid generation of wind-blown dust;</li> <li>– Any stockpiled material will be managed in accordance with best practise guidelines (such as Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (2009)). When required, pre-earthwork drainage will be put in place to avoid sediment being washed off site and will be included in the CEMP; and</li> <li>– The Contractor will be required to prepare a Construction Traffic Management Plan (CTMP) to minimise site traffic and, if relevant, damage to soil structure from smearing and compaction.</li> </ul> <p>To minimise the potential for adverse impacts to soil chemistry and to water quality during construction, the following is an outline of the general mitigation measures that will be in place:</p> <ul style="list-style-type: none"> <li>– The construction of the Designated Development will be in accordance with good practice.</li> <li>– The E&amp;C Contractor will be required to include measures in the Final CEMP for minimising erosion by reducing disturbance and stabilising exposed materials. The plan will also consider control measures to minimise the release of mobilised sediment. The Final CEMP will also include methods of handling and storing chemicals and fuels, followed by an Emergency Response Plan to be implemented in the event of a spill or leak.</li> <li>– Water quality monitoring will be undertaken pre and during-construction, details of which will be included in the Final CEMP. This will be based on a combination of visual observations, in situ testing using handheld water quality probes, and periodic sampling for laboratory analysis.</li> <li>– The E&amp;C Contractor will be required to ensure the safe storage of any hazardous materials or chemicals required onsite. Storage areas for flammable/ toxic/ corrosive materials will be located in a separate, locked, impermeable bunded and fenced off area. Material data sheets will be available for all these materials and the COSHH (Control of Substances Hazardous to Health) assessments kept within the relevant Risk Assessment for the task, all subject to the Applicant's approval. Storage will not be within 30m of a watercourse and designated storage areas will be bunded to 110% of storage capacity to contain the effects of any spills. These areas will be cleared and re-instated following completion of the Site.</li> <li>– A Resource Waste Management Plan will be prepared, and all relevant contractors will be required to seek to minimise waste arising at source and, where such waste generation is unavoidable, to maximise its recycling and reuse potential. Recycling of materials will primarily</li> </ul>	<p>Ground investigation will be undertaken before construction to inform the development of the preliminary and detailed design.</p> <p>The ground investigation will be designed to target the potentially contaminative sources identified. Where risks are deemed to be unacceptable, further detailed quantitative risk assessment and if required, detailed remediation strategies will be developed accordingly, pursuant to the process set out by the planning authorities.</p> <p>Additional measures to be confirmed in final CEMP.</p> <p>Water quality monitoring will be undertaken in line with the requirements if the IE Licence.</p>	<p><b>To be confirmed in final CEMP.</b></p>

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Requirements	Additional	Survey Responsibility
<ul style="list-style-type: none"> <li>Alteration in overland flow paths as a result of works associated with the Designated Development; and</li> <li>Temporary impacts on off-site receptors through the inhalation of potentially contaminated dust and dermal contact with contaminated soil following ground disturbance.</li> </ul> <p>No significant effects are predicted based on the application of appropriate control measures.</p>	<p>take place off-site where noise and dust are more easily managed and less likely to impact on surrounding properties.</p> <ul style="list-style-type: none"> <li>Should significant contamination occur as a result of construction stage activities, KCC and the EPA will be notified, and corrective actions will be agreed.</li> <li>If water is encountered during below ground construction, suitable best practice de-watering methods will be used. No significant groundwater dewatering is anticipated but, if required, will be undertaken as outlined in Section 4.7.</li> <li>Construction works will be carried out in such a way as to prevent, contain, or limit, as far as reasonably practicable, any adverse effects arising from the presence of contaminated land or materials (if encountered). Examples of these measures are as follows:                             <ul style="list-style-type: none"> <li>A contamination watching brief/environmental oversight to ensure that any significant contamination not identified during previous site investigations is recorded and dealt with appropriately;</li> <li>Should ground with significant levels of unknown contamination be encountered during construction, working methods and procedures for handling and disposal of material will be employed to minimise risk in line with the EPA's "Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites". If required, the material will be disposed of at a suitably licensed waste facility;</li> <li>'Clean' and 'dirty' (contaminated) work areas will be divided by internal fencing if contamination is encountered;</li> <li>Personal Protective Equipment (PPE) will be worn by ground workers and other staff;</li> <li>Those potentially at risk will be made aware of potential site hazards via site safety induction and toolbox talk procedures.</li> </ul> </li> </ul>			
	<p>To minimise the potential for adverse impacts to off-site receptors and construction workers, the following is an outline of the general mitigation measures that will be in place:</p> <ul style="list-style-type: none"> <li>The Contractor has a duty under the Safety, Health, and Welfare at Work Act 2005 and the Control of Substances Hazardous to Health (COSHH) Regulations 2002 to protect their employees against hazardous substances encountered at work. To that end and in accordance with <i>CIRIA guidance R132 A Guide for Safe Working on Contaminated Sites</i><sup>4</sup>, the Contractor will be required undertake a COSHH assessment before any work is carried out at the Site which is likely to expose staff to substances hazardous to health. Even if no hazardous substances are identified during the planned site investigation, it would be best practice for the Contractor to ensure that all employees (construction workers) are issued with PPE appropriate to the hazards identified. PPE could consist of hazard-specific gloves, eye protection and respiratory protective equipment (RPE).</li> </ul>			

<sup>4</sup> CIRIA (1996).

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Requirements	Additional	Survey	Responsibility
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- The Contractor will implement measures to minimise the amount of dust produced during the construction phase, including the preparation of a Dust Management Plan (DMP). There will be a Duty of Care on the E&C Contractor to ensure that dust-raising activities are located away, and upwind where possible, from sensitive receptors as much as feasibly possible, the duration be kept to a minimum when in proximity to a receptor, and the spread of dust be controlled by judicious use of water, the most effective and efficient way being in the form of a fine spray.

Comprehensive Site Investigations (SI) will be undertaken prior to construction to better understand the existing ground conditions and will inform the siting and layout of the Designated Development.

It should be noted that the Designated Development involves limited excavation and will be constructed in accordance with current engineering standards, including site investigation and understanding of ground conditions to inform construction works and design.

Mitigation measures for construction works including soil handling are incorporated into the CEMP to be implemented by the E&C Contractor who will conduct the works. Should KCC consider independent supervision of these works to be required at the expense of the developer, the Applicant would be agreeable to this being implemented through an appropriately-worded planning condition.

**Table 3-6: Water**

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Additional Survey Requirements	Responsibility
Pollution of bedrock groundwater or impact on the superficial deposits aquifer flow regime	Mitigation measures as outlined within the Land and Soils section of this CEMP are also relevant for the protection of water during the construction phase activities and should be read in conjunction with the below.	Water quality monitoring will be undertaken in line with the requirements if the IE Licence.	<b>To be confirmed in final CEMP</b>
Pollution of bedrock groundwater or impact on the bedrock aquifer flow regime	Run-off into excavations / earthworks cannot be prevented entirely and is largely a function of prevailing weather conditions.	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 30m from water bodies. 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.	
Damage or loss of features of geomorphological features of interest	Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts. All run-off will be prevented from directly entering into any water bodies as no construction will be undertaken directly adjacent to open water.		
Reduced groundwater level and flow alteration and/or potential groundwater flood risks	During the construction phase water pollution may occur directly from spillages of polluting substances into waterbodies, or indirectly by being conveyed in runoff from hard standing, other sealed surfaces or from construction machinery. Fine sediment may also wash off working areas and hard standing (including approach roads) into waterbodies indirectly via existing drainage systems or overland flow. Due to the industrial activity of the Site, this sediment may potentially contain contamination that could be harmful to the aquatic environment.	A programme of water monitoring and controlled discharges of water abstracted from open excavations should be implemented.	
Pollution of surface water and shallow groundwater	The amount of dewatering required during the construction phase of the Designated Development and possible result in the localised lowering of the water table is not known. As such, a Hydrogeological Risk Assessment (HRA) will be carried out prior to construction in order to determine, if any, the impact of dewatering at the site.	Where necessary, it is proposed that groundwater monitoring of existing boreholes (using boreholes installed as part of the Ground Investigation (GI) should be undertaken around the site in order to ensure the monitoring process is effective. Automatic water level data loggers (or other suitable method) to facilitate continuous monitoring would be installed in selected monitoring boreholes at strategic locations.	
No significant effects are predicted based on the application of appropriate control measures.	<p>There may also be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavation is kept relatively dry.</p> <p>Measures to protect the water environment will be formulated in accordance with best practice guidance. The best practice guidelines are as follows:</p> <ul style="list-style-type: none"> <li>– IFI (2016). <i>Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters</i>.</li> <li>– CIRIA C741 <i>Environmental Good Practice on Site</i> (3rd edition) (C692).</li> <li>– CIRIA C532 <i>Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors</i>.</li> <li>– CIRIA guidance documentation C648 'Control of Water Pollution from Linear Construction Projects'</li> <li>– C609 (2004) <i>Sustainable Drainage Systems</i>, hydraulic, structural and water quality advice.</li> </ul>		

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Additional Survey Requirements	Responsibility
	<ul style="list-style-type: none"> <li>- British Standards Institute (2009) BS6031:2009 Code of Practice for Earth Works. British Standards Institute (2013) BS8582 Code of Practice for Surface Water Management of Development Sites.</li> <li>- Sustainable Drainage Systems ("SuDS") constructed on the Site will be in accordance with The SuDS Manual (C753) (CIRIA, 2015) and the Site handbook for the construction of SuDS (C698) (CIRIA, 2007).</li> </ul>		
	<p><b>General Surface Water Management</b></p> <ul style="list-style-type: none"> <li>- The existing surface water management system, such as drains, settlement ponds, outfalls, and interceptors / separators, will be inspected and confirmed to be in suitable working order prior to any Designated Development works commencing on the Site.</li> <li>- Additional new drainage installations will be installed in early stages of construction, alongside the remaining existing drainage facilities, can be used to treat runoff for silt and hydrocarbons early on 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.</li> <li>- 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 Designated Development, including runoff from dust suppression, prior to discharge.</li> <li>- 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.</li> <li>- There will be regular monitoring and prompt maintenance of these the overall surface water management system throughout the Designated Development. This will ensure that the drainage system continues to function as designed.</li> <li>- There will be no direct discharge to any water body at any time during the demolition, construction, or phases. All surface water run-off within the Site will be directed to this drainage system.</li> </ul>		
	<p><b>Sedimentation (Suspended Solids)</b></p> <p>During the construction phase, the mitigation measures will ensure that no sediment contamination, contaminated run-off, or untreated wastewater will enter water bodies on or near the Site. The following control measures will be implemented by the Contractor to manage silt-laden runoff into water bodies:</p> <ul style="list-style-type: none"> <li>- Excavations will only remain open for the shortest possible time to reduce groundwater ingress. Silt traps will be placed around the Site to reduce silt loss, and these will be inspected and cleaned or replaced regularly.</li> </ul>		

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Additional Survey Requirements	Responsibility
	<ul style="list-style-type: none"> <li>– Run-off from spoil heaps will be prevented from entering water bodies by diverting it through settlement ponds and removing material off-site as soon as possible to designated storage areas.</li> <li>– 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.</li> <li>– Sediment barriers, such as silt fencing, will be used in areas where works are within 10m of water bodies. These barriers will be installed to directly treat surface water or direct surface water to the wider surface water management system. No existing riparian vegetation will be removed at any stage of the works.</li> <li>– The extent of exposed ground will be minimised where possible and stockpiles covered so to reduce sediment supply and prevent the creation of any contaminated runoff. The potential will be further minimised by using grit traps to drain stockpile and wheel-wash areas so silt from these activities can be diverted to the drainage network. Straw bales and Terram will also be used at appropriate locations deemed to be at risk from silt pollution during construction works. In addition to these mitigation measures, general methods of good practice to keep the site tidy will be employed to minimise surface water contamination.</li> <li>– Should short-term stockpiles be required these will be located at least 30m away from any water body. Slopes of these stockpiles will be made stable and regularly checked by the contractor or appointed staff member. Stockpiles shall be stored on impermeable surfaces and covered using tarpaulin.</li> <li>– Surface water run-off from working areas will not be allowed to discharge directly to the River Shannon. To achieve this, the drainage system will be constructed prior to the commencement of major site works. All design and construction will be carried out in accordance with <i>CIRIA C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors</i>.</li> <li>– To control erosion, areas of exposed ground and stockpiles will only be created when the area of the Site is to be worked upon. Stockpiles will be located 20m away from drains and water body where there is no sloped gradient. Stockpiles will be stabilised as soon as they are completed (e.g., seeded or geotextile mats), and banded by earth or silt fences at the toe of the stockpile to intercept silt-laden runoff during rainfall events. Stockpiles will not be located where there is a steep slope towards a drain.</li> <li>– Wash water with oils or chemicals will not enter any waterway by containing the wash water within a banded and impermeable designated site and will be tankered off-site for authorised disposal.</li> </ul>		
<b>Fuel and Chemical Handling</b>			

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Additional Survey Requirements	Responsibility
	<p>It will be necessary to adopt the following mitigation measures at the Site in order to prevent spillages to ground and drains of fuels, and to prevent any consequent surface water impacts.</p> <ul style="list-style-type: none"> <li>– Designate a bunded storage area at the Contractor’s compound(s) and at least 30m away from surface water gullies or drains for oils, solvents and paints used during construction. The fuel storage tanks shall be bunded to a volume of 110% of the capacity of the largest tank / container within the bunded area, away from any drains and / or water body. The Contractor will allow for regular checks and maintenance as required.</li> <li>– Drainage from the bunded area shall 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.</li> <li>– 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 shall 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 should be disposed of via a hazardous waste contractor.</li> <li>– Where mobile fuel bowzers are used on the Site in the event of a machine requiring refuelling outside of the designated area, fuel will be transported in a mobile double skinned tank. Any flexible pipe, tap or valve must be fitted with a safety lock where it leaves the container and locked shut when not in use. Each bowser should carry a spill kit and each bowser operator must have spill response training. No refuelling will be allowed within 30m of a surface water body.</li> <li>– Adequate stocks of hydrocarbon absorbent materials (e.g., spill-kits and / or booms) shall be held on-site in order to facilitate response to accidental spills. Spill response materials shall also be stored on all construction vehicles. It is important that the spill kits are regularly inspected and immediately replaced if used.</li> <li>– 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.</li> <li>– The storage of fuels and hazardous materials during the construction phase provides further potential for pollution incidents. Some removed topsoil and excavated material will be stored for reuse by the site, and it is important that these designated storage areas are strategically located in relation to the water bodies and any other drains, so that there is no risk of topsoil, or any other material being washed into the water bodies or drainage network.</li> <li>– The storage of hazardous substances will be necessary during construction and a number of considerations will need to be made to reduce the potential for pollution from these sources. Fuel will be required to be stored at least 30m from a water body and refuelling will only take place in designated areas, on hardstanding by appropriately trained personnel.</li> </ul>		

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Additional Survey Requirements	Responsibility
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**Accidental Spillage, Flooding or Other Emergencies**

- The Contractor will implement in full the prescribed measures identified below:
  - 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.
  - An Emergency Response Plan will be prepared by the appointed Contractor and included in the Final CEMP and construction workers trained to respond to spillages.
  - A copy of the Emergency Response Plan 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 required 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 Emergency Response Plan 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.

**Concrete, cement, and grout**

- 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. Wash-outs will only be allowed to take place in designated areas with an impervious surface.



Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Additional Survey Requirements	Responsibility
	<ul style="list-style-type: none"><li>- Concrete will be used to construct the Designated Development and will therefore need to be managed to reduce the potential for pollution. The Principal Contractor will be required to 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.</li><li>- 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.</li></ul>		

**Table 3-7: Climate**

Potential Impact	Mitigation / Enhancement Measure	Monitoring/ Additional Survey Requirements	Responsibility
Greenhouse gas emissions. In-combination climate change impact.	<p>The Framework CEMP will act as an overarching document that presents a number of considerations that will limit GHG emissions and ensure the Designated Development is in line with industry best practice standards.</p>	To be confirmed in the Final CEMP.	<b>To be confirmed in the Final CEMP.</b>
No significant effects are predicted based on the application of appropriate control measures.	<p>The following list outlines a number of measures that will be considered for integration into the construction and decommissioning phases of the Designated Development, to minimise GHG emissions.</p> <ul style="list-style-type: none"> <li>• When sourcing materials for the Designated Development first choice should be given to locally sourced materials.</li> <li>• Any existing materials already on the Site should be considered for reuse for the Designated Development, where feasible.</li> <li>– When possible, machinery, vehicles and energy should all use low and zero carbon energy e.g., electric vehicles and solar powered pitch lights.</li> <li>• Workers will be informed of the ways in which they can reduce their energy use and avoid unnecessary energy consumption onsite e.g., avoid leaving equipment running when not in use and turning off lighting when not in use.</li> <li>• Reduce potential emissions by minimising the waiting time for loading and unloading materials, and efficiently handling materials on site.</li> <li>• Undertaking regular maintenance of plant and machinery.</li> </ul> <p>The following is a number of measures that will be considered for integration into the construction and decommissioning phases of the Site, to help reduce the effects of climate change and extreme weather events on the Designated Development.</p> <ul style="list-style-type: none"> <li>• Preference will be given to construction materials that are more resilient to the identified impacts of climate change.</li> <li>• The Contractor will monitor weather forecasts and plan works accordingly, protecting workers and resources from any extreme weather conditions.</li> <li>• Consideration will be given to suitable storage and bunding of any pollutants to protect from high rainfall events.</li> <li>• Omit any topographic low points and install drainage if required to mitigate the risk of surface water flooding.</li> <li>• Critical equipment to be raised above estimated peak flood level (e.g., electrical equipment).</li> <li>• Minimise maintenance during extreme weather events e.g., high wind events.</li> </ul> <p>Maintenance of the drainage system to be included within the general site management.</p>		

**Table 3-8: Cultural Heritage**

Potential Impact	Mitigation / Enhancement Measure	Monitoring/ Additional Survey Requirements	Responsibility
<p>Previous groundworks will have impacted any unrecorded heritage assets which may have existed.</p> <p>Groundworks associated with the Designated Development will introduce noise, dust, and vibration to the study area. This could impact the settings of heritage assets especially the Protected Structures.</p> <p>No significant effects are predicted based on the application of appropriate control measures.</p>	<p>The following impact avoidance/ mitigation measures will be followed:</p> <p>If unexpected archaeological remains or artefacts are discovered during construction work, work in that area will immediately cease and the area will be protected and made secure ensuring no access to plant or site staff until an Archaeological Contractor has inspected the suspected archaeological remains. The Archaeological Consultant and National Monuments Service (NMS) will be notified, and an unexpected find protocol will be implemented as outlined below:</p> <ul style="list-style-type: none"> <li>• all archaeological works (which will be agreed by the Archaeological Consultant and NMS) will be carried out in compliance with the National Monuments Acts 1930 – 2004 (and Policy and Guidelines on Archaeological Excavation (Department of Arts, Heritage Gaeltacht, and the Islands, 1999);</li> <li>• a suitably qualified and licensed Archaeological contractor will be appointed to carry out the archaeological fieldwork;</li> <li>• relevant licenses will be acquired from the NMS for all archaeological works, which will be carried out in accordance with an over-arching Method Statement for Archaeological Works prepared by the Archaeological Consultant and agreed with the NMS.</li> </ul>	<p>To be confirmed in Final CEMP.</p>	<p><b>To be confirmed in final CEMP.</b></p>

**Table 3-9: Material Assets**

Potential Impact	Mitigation / Enhancement Measure	Monitoring / Additional Survey Requirements	Responsibility
<p>Risk to the environment from accidental pollution incidents.</p> <p>No significant effects are predicted based on the application of appropriate control measures.</p>	<p>The following measures will be implemented during the construction phase:</p> <ul style="list-style-type: none"> <li>• Construction works will be carried out in such a way as to prevent, contain, or limit, as far as reasonably practicable, any adverse effects arising from the presence of contaminated land or materials (if encountered).</li> <li>• 'Clean' and 'dirty' (contaminated) work areas will be divided by internal fencing where any contamination is encountered.</li> <li>• Appropriate Personal Protective Equipment (PPE) will be worn by ground workers and other staff.</li> <li>• Those potentially at risk will be made aware of potential hazards via site safety induction procedures.</li> <li>• Leaks and spills will be prevented, and control measures (outlined in Section 4.7 of the TEG ER (AECOM, 2023) used to prevent contaminants entering the sub-surface or groundwater environment.</li> <li>• Material removed as part of the construction will be re-used elsewhere in the project where practicable and possible.</li> <li>• Any soil / overburden encountered will be separated where removal is required and will be conserved and stored in a designated area and appropriately protected, ready for re-use as fill for the project.</li> <li>• Contaminated materials will be assessed as either: solids; liquids; gas; and leachate to allow for appropriate management.</li> <li>• The measures outlined in Table 3.6 will be implemented to prevent the contamination of ground and surface watercourses during the works.</li> <li>• Hazardous dust emissions will be prevented during excavation, or from stockpiles by implementing the measures outlined in Table 3.1.</li> <li>• The Contractor has a duty under the <i>Safety, Health, and Welfare at Work (Construction) Regulations 2013</i> to protect their employees against hazardous substances encountered at work. To that end and in accordance with CIRIA guidance (R132) <i>A guide for safe working on contaminated sites (1996)</i>, the Contractor will be required to undertake a risk assessment before any work is carried out at the site which is likely to expose staff to substances hazardous to health. Should hazards be identified during additional site investigation, the Contractor will be required to ensure that all employees (construction workers) are issued with personal protective equipment (PPE) appropriate to the hazards identified. PPE will, as required, consist of hazard specific gloves, eye protection and respiratory protective equipment (RPE).</li> </ul>	<p>To be confirmed in the Final CEMP.</p>	<p><b>To be confirmed in final CEMP.</b></p>

**Table 3-10: Landscape and Visual**

Potential Impact	Mitigation / Enhancement Measure	Monitoring / Additional Survey Requirements	Responsibility
<p>Visibility of new landscape features. Increased visibility of construction activities and vehicles.</p> <p>No significant effects are predicted based on the application of appropriate control measures.</p>	<p>The Contractor's CEMP will incorporate all the mitigation measures required to ensure the works is carried out in a way that minimises the potential for impacts to occur to the landscape, natural heritage, and visual environment.</p> <ul style="list-style-type: none"> <li>- With the primary objective to minimise the visual impact of the Designated Development so it is as unobtrusive as feasible against the existing environment backdrop. The stack will be finished in a light grey colour the stacks will be finished in a light grey colour (RAL7038), to blend in with the surrounding environment to help reduce attention away from industrial elements and help blend-in the various elements with the landscape in possible available views from local residences, the public road network, and in estuarine views across the River Shannon including designated views and prospects, scenic routes, and the Wile Atlantic Way.</li> <li>- There are elements of the existing facility that are screened by boundary vegetation from the sensitive receptors to the southeast of the Designated Development. It is essential that tree protection measures as described in BS 5837:2012 are applied in order to protect the existing trees within the Site during the construction phase.</li> <li>- A suite of mitigation measures have been provided by the ecology team setting out the measures to be implemented to ensure The Wildlife Acts of 1976 and 2012 as amended ("The Wildlife Act") and the Flora (Protection) Order, 2022 when undertaking any works which will affect protected species and there is no pollution of watercourses, waterbodies, or terrestrial habitats, in accordance with guidelines such as Construction Industry Research and Information Association's (CIRIA) Control of water pollution from construction sites (CIRIA, 2001).</li> <li>- It is proposed a perimeter fence (5 to 8m) will be erected prior to constructing to provide visual and acoustic screening.</li> </ul> <p>Mitigation and enhancement measures to be implemented include:</p> <ul style="list-style-type: none"> <li>- where existing vegetation is present along the Designated Development Site boundary, this will be retained, as far as reasonably practicable, and managed to ensure its continued presence to aid the screening of low level views into the Site; and</li> <li>- where possible, site compounds, plant and material stockpiles will be located in areas suitably screened from external views.</li> </ul> <p><b>Lighting</b></p> <ul style="list-style-type: none"> <li>- a Light Management Plan (LMP) will accompany the Final CEMP which sets out the approach for use of lighting during the construction phase;</li> <li>- lighting will be minimised in terms of number of lights and the power of the lights (lux level) during construction. Lighting required during the construction stage of the Designated Development will be designed to reduce unnecessary light spill/ glare outside of the Designated Development Site boundary. Directional lighting, facing and located away from the Designated Development Site's boundary, will be used. Lighting will be turned off when not in use except to meet the minimum requirements for Health and Safety.</li> </ul>	<p>To be confirmed in final CEMP</p>	<p><b>To be confirmed in final CEMP.</b></p>

**Table 3-11: Traffic Management**

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Requirements	Additional	Survey	Responsibility
<p>Increased traffic flows, including HGV, on the roads leading to the Site.</p>	<p>The access points to the Designated Development Site are located off the N67. In order to minimise disruption to local traffic and maintain the safety of road users, the Contractor will be required to establish a traffic management system. This will account for:</p> <ul style="list-style-type: none"> <li>– planning and controlling the movement of vehicles, plant and non-motorised users that are present within the Designated Development Site, access to and egress from the Designated Development Site and on the adjacent road network; and</li> <li>– ensure that safety of construction operatives, motorised and non-motorised users are not compromised.</li> </ul> <p>This will be achieved by effective implementation of a Construction Traffic Management Plan (CTMP) to be prepared and initiated by the Contractor. The CTMP shall be included as part of the Contractor's CEMP.</p> <p><b>Construction Traffic Management Plan (including HGV)</b></p> <p>The objective of the CTMP will be to:</p> <ul style="list-style-type: none"> <li>– limit journeys to and from the Site by the workforce, sub-contractors, suppliers, and anyone else who is likely to visit the Site regularly;</li> <li>– provide protection from traffic hazards that may arise as a result of the construction activities and journeys to and from the Site;</li> <li>– installation of mirrors and construction traffic warning signs at site entrances;</li> <li>– manage potential adverse impacts on the public road network and ensure network performance is maintained at an acceptable level;</li> <li>– minimise adverse impacts on users (motorised and non-motorised) of the public road network and adjacent properties and community facilities;</li> <li>– plan deliveries to the Site;</li> <li>– ensure adequate signage is in place at the Site access points before use; and</li> <li>– ensure that the roads and footways at the site accesses are kept clear of debris, runoff, soil, and other material (complementing the Site wheel wash facilities).</li> </ul> <p>The Contractor will make local residents aware of the proposed works which will be undertaken. Therefore, the Contractor will be required to always accommodate and make provision for access and egress to these premises paying particular attention to the provision of pedestrian / disabled / cyclist safe access and egress.</p> <p>The CTMP will include alternative routes for pedestrians and vehicles in the event that public roads or right of ways are closed during works, although this is not expected to be required. The CTMP will include measures to limit the amount of queuing required by construction vehicles outside the Site boundaries.</p>	<p>The Contractor will undertake such monitoring as is necessary to assess the effectiveness of the measures included in the CTMP to control the routing and impact of construction traffic including HGV. This will include the maintenance of records of construction HGV entering and leaving the Site, which will be available to the relevant planning authority on request.</p> <p>Monitoring measures will provide a firm basis upon which to answer queries and complaints. Further details to be confirmed in the Final CEMP.</p>			<p>CTMP Co-ordinator to oversee management, monitoring, and implementation of the individual measures within the CTMP.</p> <p><b>To be confirmed in Final CEMP.</b></p>

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Requirements	Additional	Survey Responsibility
	<p>Construction debris particularly site clearance, spoil removal and dirty water runoff, have the potential to cause a significant impact on footpaths and roads adjoining a construction site, if not adequately dealt with and these matters will be fully addressed in the contractors CTMP.</p> <p><b>Traffic Management General Measures</b></p> <ul style="list-style-type: none"> <li>– 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;</li> <li>– 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.</li> <li>– Temporary signage designating permissible HGV routes;</li> <li>– Material deliveries and collections from site will be planned, scheduled, and staggered to avoid unnecessary build-up of demolition/construction works related traffic;</li> <li>– HGV trips are anticipated to arrive and depart the site at a uniform rate throughout the day to avoid pressure on the morning and evening peak hour periods;</li> <li>– 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;</li> <li>– Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds within the site;</li> <li>– 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;</li> <li>– 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;</li> <li>– 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 roads;</li> <li>– 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;</li> <li>– Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footways. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users including mobility impaired persons; and</li> <li>– Using Garda escorts for abnormal loads where required.</li> </ul> <p><b>Site Management measures:</b></p>			

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Requirements	Additional	Survey Responsibility
	<ul style="list-style-type: none"> <li>- complaint registers will be kept detailing all telephone calls and letters of complaint received in connection with construction activities, together with details of any remedial actions carried out;</li> <li>- equipment and vehicles used on site will be in good condition such that emissions from diesel engines etc. are not excessive;</li> <li>- pre-start checks will be carried out on equipment to ensure they are operating efficiently and that emission controls installed as part of the equipment are functional;</li> <li>- monitoring and control of demolition / construction traffic during construction works; and</li> <li>- the use of prefabricated elements to minimise on site fabrication and assembly thereby reducing the numbers of site operatives required.</li> </ul> <p>Dust deposition levels will be monitored on a regular basis in order to assess the impact that site activities may have on the local ambient air quality. The following procedures will be implemented:</p> <ul style="list-style-type: none"> <li>- The dust deposition rate will be measured by positioning Dust Deposit Gauges at strategic locations near the boundaries of the site for a period of 30 (+/- 2) days if required. Monitoring should be conducted as required during periods when the highest levels of dust are expected to be generated i.e., during site preparation works and soil stripping activities.</li> <li>- The exact locations will be determined after consideration of the requirements of Method VDI 2119 with respect to the location of the samplers relative to obstructions, height above ground and sample collection and analysis procedures.</li> <li>- After each 30 (+/- 2 days) exposure period, the gauges will be removed from the sampling location, sealed and the dust deposits in each gauge will be determined gravimetrically by an accredited laboratory and expressed as a dust deposition rate in mg/m<sup>2</sup>/day in accordance with the relevant standards.</li> <li>- Technical monitoring reports detailing all measurement results, methodologies and assessment of results shall be subsequently prepared and maintained by the Site Manager</li> </ul> <p><b>Site Routes:</b></p> <ul style="list-style-type: none"> <li>- Site access routes (particularly unpaved areas) can be a significant source of fugitive dust from construction sites if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25% to 80%.</li> <li>- A speed restriction of 20km/h on surfaced and 15km/h on unsurfaced haul roads and work area will be applied as an effective control measure for dust for on-site vehicles or delivery vehicles within the vicinity of the Site;</li> <li>- Bowsers will be available during periods of dry weather throughout the construction period. Research shown found that the effect of surface watering is to reduce dust emissions by 50%. The bower will operate during dry periods to ensure that unpaved areas are kept</li> </ul>			



Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Requirements	Additional	Survey Responsibility
	<p>moist. The required application frequency will vary according to soil type, weather conditions and vehicular use; and</p> <ul style="list-style-type: none"> <li>- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced areas shall be restricted to essential Site traffic only.</li> </ul> <p><b>Site Traffic on Public Roads:</b></p> <ul style="list-style-type: none"> <li>- Spillage and blow-off of debris, aggregates and fine material onto public roads will be reduced to a minimum by employing the following measures:</li> <li>- Vehicles delivering material with potential for dust emissions to an off-site location shall be enclosed or covered at all times to restrict the escape of dust;</li> <li>- Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only;</li> <li>- A power washing facility or wheel cleaning facility will be installed near to the Site compound for use by vehicles exiting the site when appropriate, and</li> <li>- Road sweepers will be employed to clean the Site access route as required.</li> </ul> <p><b>HGV and Abnormal Loads</b></p> <ul style="list-style-type: none"> <li>- HGV arrivals, including deliveries, will be managed as far as reasonably practicable to avoid on-site congestion. Any noisy works outside the core working hours, if required, will be agreed with the Applicant on a case by case basis.</li> <li>- Traffic movements will be controlled during the Designated Development construction phase in order to minimise potential impacts on the surrounding road network. The contractor will be required to provide detail of any HGV routing in the full CTMP. This will consider where deliveries will be made to/from and what roads will be used.</li> <li>- Should any complaints be raised by members of the public with regards to construction HGV not using the dedicated HGV route to the Site, records along with CCTV footage where available would be used to identify the offending HGV involved and appropriate sanctions put in place with the aim of avoiding repeat events.</li> <li>- The Contractor must ensure that the designated HGV route is adhered to by HGV drivers and the contractor must ensure that the policy and routing plan is distributed to all HGV drivers. This policy will be reinforced during staff inductions, with sanctions put in place to deal with non-compliance with the aim of ensuring no repeat events.</li> <li>- To ensure compliance with the measures set out above, the contractor must enforce the disciplinary procedure, 'yellow/ red card system' or equivalent.</li> <li>- In the first event of non-compliance, a warning will be issued to the HGV driver (yellow card). In the event of any repeat of the contravention, that driver will be prohibited from making further HGV deliveries to the Site (red card).</li> <li>- As mentioned above the contractor must distribute the HGV routing plan to all HGV drivers during their induction. It will be a condition of contract between the Applicant and the</li> </ul>			

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Requirements	Additional	Survey Responsibility
	<p>Contractor to aim to ensure that all construction HGV deliveries must use the designated route to access and egress the construction site. Sanctions will be put in place to deal with non-compliance in the interests of highway safety, wheel cleaning facilities will be installed at the Site from the start of the construction phase. All HGV would be required to wheel wash when exiting the Site.</p> <ul style="list-style-type: none"> <li>- A 24-hour contact name and number will be displayed on a notice board at the Site entrance and on the Applicant's website, for members of the public to contact should they have any issues regarding construction traffic.</li> <li>- Residents will be updated on the construction of the Designated Development via a regular update bulletin posted on the Applicant's website. This will include information on the general timing and routing of abnormal load deliveries and a 24-hour contact name and number for members of the public to contact should they have any issues regarding construction traffic. It is anticipated that the project liaison manager will act as the initial point of contact for members of the community to find out further information;</li> <li>- The contractor will erect signage at the main junctions to appropriately direct all HGV traffic relating to the Designated Development (both accessing and egressing the site). These will be in place for the duration of the construction phase and will be checked regularly to confirm they are visible throughout.</li> <li>- The Contractor will be required to maintain all the HGV route signage.</li> </ul> <p>A formal process of liaison between all relevant parties (for example Contractor and the relevant County Council) will:</p> <ul style="list-style-type: none"> <li>- make all parties aware of the results of monitoring of the final CTMP;</li> <li>- provide a route by which any complaints and transport related issues can be communicated, identified, and dealt with.</li> </ul> <p>The Final CEMP will include vigilance and security systems to safely shutdown the plant in the event of any aircraft related incident.</p> <p>During the commissioning (and operational) phase, working with suppliers to ensure that all relevant materials (including chemicals) bought to the Site that are classified as hazardous are transported in compliance with applicable regulations and guidance.</p>			

**Table 3-12: Waste Management**

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Additional Requirements	Survey Responsibility
<p>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 will be further detailed in the appointed Contractor's RWMP.</p> <p>The waste management facilities to be utilised during 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)). Since this recovery rate is above 70% this is therefore not considered significant.</p> <p>The quantities of waste from excavation are unlikely to be more than 5% of national waste arisings and therefore not considered significant.</p>	<p>A site-specific Resource and Waste Management Plan (RWMP) will be prepared by the Contractor. The RWMP will be employed to ensure sustainable and effective waste management throughout the construction phase of the Designated Development.</p> <p>Adherence to the RWMP prepared for the construction works will ensure that the management of waste arising is dealt with in compliance with the provisions of the Waste Management Act 1996 (as amended)<sup>5</sup>, associated Regulations, Litter Pollution Act of 1997 (as amended)<sup>6</sup> and the Southern Region Waste Management Plan 2015-2021 and A Waste Action Plan For a Circular Economy and that it will achieve optimum levels of waste reduction, re-use and recycling.</p> <p>A range of good practice measures will include the following:</p> <ul style="list-style-type: none"> <li>– Select procurement routes to minimise unnecessary packaging, e.g., applying 'Just-in-Time' (JIT) delivery processes to minimise material spoilage.</li> <li>– Use of 'consolidation centres' to support JIT delivery - these are strategically-located storage and distribution facilities where materials can be stored prior to JIT delivery to sites.</li> <li>– Implement ordering procedures and supply chain systems that avoid waste, i.e., no over-ordering, use of take-back schemes for packaging, material surplus and offcuts.</li> <li>– Select procurement routes that minimise unnecessary packaging.</li> <li>– Plan the work sequence to reduce the potential for on-site residual resource generation.</li> </ul> <p>The following approaches will be implemented, where practicable, to further minimise the quantity of waste arising and requiring disposal:</p> <ul style="list-style-type: none"> <li>– Reuse of materials on-site wherever feasible, e.g., reuse of excavated soil for landscaping, recycling of demolition materials into aggregates.</li> <li>– Off-site prefabrication, where practical, including the use of prefabricated elements.</li> <li>– Segregation of waste at source, where practical, to facilitate a high proportion and high-quality recycling.</li> <li>– Off-site reuse, recycling and recovery of materials and waste where reuse on-site is not practical, e.g., through use of an off-site waste segregation or treatment facility or for direct reuse or reprocessing off-site.</li> </ul> <p><b>Recycling</b></p> <p>The aim is to reuse materials won on-site by recycling them into an alternative form that can be used for construction purposes (for example crushing concrete, brick, or other inert wastes to produce aggregate material). By recycling on-site, as far as practicable, the quantity of waste requiring off-site management is reduced and carbon emissions associated with transportation are eliminated.</p> <p>Recycling may also be achieved by utilising materials with a recycled content, such as recycled aggregates produced off-site.</p>	<p>To be confirmed in the Final CEMP</p>	<p><b>To be confirmed in the Final CEMP.</b></p>

<sup>5</sup> GOI (1996). Waste Management Act 1996. Available at: <https://www.irishstatutebook.ie/eli/1996/act/10/enacted/en/html>.

<sup>6</sup> GOI (1997). Litter Pollution Act. Available at: <https://www.irishstatutebook.ie/eli/1997/act/12/enacted/en/print.html>

Potential Impact	Mitigation/ Enhancement Measure	Monitoring/ Requirements	Additional	Survey	Responsibility
	<p><b>Recovery</b></p> <p>This generally aims to recover energy from waste which cannot otherwise be reused or recycled. This may include waste materials such as hazardous liquids or solids that can be sent to energy from waste facilities. Recovery may also include the beneficial use of materials on land for restoration (backfilling operations).</p> <p><b>Disposal</b></p> <p>The least preferred option in the Waste Hierarchy is a final disposal route such as landfill. Some waste streams will inevitably end up with such a solution.</p> <p>When placing waste disposal contracts, the Contractor will consider the implications of long-distance travel in terms of health and safety risk, commercial terms, and increased emissions from vehicles.</p> <p><b>Waste Storage</b></p> <p>The main waste storage area will be located within the Site compound. A dedicated and secure area containing bins, and / or skips and storage areas will be provided for waste materials generated by construction site activities.</p> <p>Waste materials generated will be segregated at waste collection and storage areas where it is practical. Where the on-site segregation of certain waste types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source. All waste receptacles leaving site will be covered or enclosed. The appointed waste Contractor will collect and transfer the wastes as receptacles are filled.</p> <p>The Site construction manager will ensure that all staff are informed of the requirements for segregation of waste materials by means of clear signage and verbal instruction. Site employees will be made responsible for ensuring good Site housekeeping.</p> <p><b>Pest Management</b></p> <p>A pest control operator will be appointed as required to manage pest on-site during the dismantling / demolition and construction phase. Organic and food wastes generated by Site staff will not be stored in open skips, but in closed waste receptacles. Any waste receptacles will be carefully managed to prevent leaks, odours, and pest problems.</p>				

## 3.2 Implementation and Operation

### 3.2.1 Roles and Responsibilities

The Contractor shall employ a suitably experienced and qualified Construction Environmental Management Plan Co-ordinator (CEMPC) / Environmental Site Officer to undertake co-ordination of monitoring of the works' impacts and implementation of the Contractor's proposals, in respect of all environmental requirements.

A CEMPC / Environmental Site Officer shall be present onsite for the duration of the Designated Development. The CEMPC / Environmental Site Officer shall be the point of contact for dealing with environmental issues for the Contractor's employees, sub-contractors, relevant authorities/environmental bodies, and members of the public. The CEMPC / Environmental Site Officer shall also be responsible for controlling the construction impacts arising from the activities of the Contractor and sub-contractors in accordance with the CEMP.

The CEMPC / Environmental Site Officer shall prepare, implement, manage, review, and revise the CEMP with the sole purpose of ensuring that the environment is safeguarded at all times from anticipated or unexpected adverse impacts during construction.

Within the Contractor's team, the CEMPC / Environmental Site Officer shall have the authority to ensure that the CEMP is effectively implemented. The CEMPC / Environmental Site Officer must notify the Applicant of any transgressions in respect of the CEMP so that necessary sanctions can be imposed.

In general, the duties of the CEMPC / Environmental Site Officer shall include the following:

- Implementation of the CEMP procedures;
- Routine environmental monitoring, recording, and reporting;
- Maintaining and auditing the CEMP and documents that underpin it;
- Environmental training including daily Toolbox Talks to site staff and design staff;
- Liaison with statutory authorities as required;
- Assist in liaison with the relevant authorities/environmental bodies and local community; and
- Any other activities that may be necessary in order to protect wildlife and the environment during the works.

Indicative contractor team roles and responsibilities have been identified within **Table 3.12**. This is indicative only and the final CEMP will set out all roles, responsibilities and actions required in respect of implementation of the measures described in this Framework CEMP, including:

- an organogram showing team roles, names, and responsibilities;
- training requirements for relevant personnel on environmental topics;
- information on site briefings and Toolbox Talks that will be used to equip relevant staff with the necessary level of knowledge to follow environmental control procedures;
- measures to advise employees of changing circumstances as work progresses;
- communication methods (e.g., updates via the Applicant's website);
- document control; and
- environmental emergency procedures.

All construction works associated with the authorised development must be carried out in accordance with the approved CEMP unless otherwise agreed with the Applicant.

**Table 3-13: Key Contractor Team Roles and Responsibilities (indicative)**

Role	Responsibilities
<b>Contractor's Project Director</b>	<ul style="list-style-type: none"> <li>▪ Assign specific environmental duties to competent members of the Contractor's Team.</li> <li>▪ Identify the environmental training needs of personnel under their control and arrange appropriate training programmes and ensure records are being maintained.</li> <li>▪ Ensure that significant environmental aspects identified for the Designated Development are managed.</li> <li>▪ Promote the continual improvement of environmental performance.</li> </ul>
<b>CEMP Coordinator (CEMPC) / Environmental Site Officer</b>	<ul style="list-style-type: none"> <li>▪ Develop, maintain, and audit the CEMP (and supporting documents/plans) to ensure all aspects, impacts and statutory requirements etc. are reflected in the CEMP.</li> <li>▪ Develop and implement a programme of regular environmental inspections, monitoring, recording, and reporting by the Environmental Site Representative(s) in accordance with procedures set out in the CEMP.</li> <li>▪ Ensure that the works are constructed in line with the CEMP.</li> <li>▪ Liaise with statutory authorities.</li> <li>▪ Attend regular construction meetings to ensure environmental issues are discussed and addressed by the Contractor's Team.</li> <li>▪ Liaise with relevant authorities/environmental bodies and the local community as required.</li> <li>▪ Comply with duties under relevant legislation and company procedures in relation to environmental incident investigation and reporting.</li> <li>▪ Provide support and training to the workforce with regard to understanding environmental aspects, impacts, regulatory requirements, best practice, constraints, and methods of working.</li> <li>▪ Nominate the Environmental Site Representative(s).</li> <li>▪ Appoint environmental specialists as required.</li> <li>▪ Ensure identified environmental specialists are in attendance onsite as required by the CEMP.</li> <li>▪ Review non-conformance reports provided by the Environmental Site Representative(s) and/or the Inland Fisheries Ireland (IFI) Environmental Advisors to identify any underlying issues or patterns to identify suitable ameliorative measures.</li> </ul>
<b>Contractor's Project Manager</b>	<ul style="list-style-type: none"> <li>▪ Ensure that the CEMP is produced, maintained, implemented, and distributed to all relevant parties.</li> <li>▪ Provide an on-call 24hr resource as a first point of contact for environmental issues/incidents.</li> <li>▪ Monitor the completion of corrective actions by the Site Manager and act as required to expedite completion.</li> <li>▪ Provide regular reports to the Applicant on environmental performance, including details of any identified incidents or non-conformances and corrective actions.</li> <li>▪ Ensure that all personnel for whom they are responsible are aware of the CEMP and implement the relevant requirements.</li> <li>▪ Evaluate the competence of all subcontractors and suppliers and ensure that they are made aware of and comply with the CEMP and associated procedures.</li> <li>▪ Establish a consultation and communication system, including employees, partners, sub-contractors, designers and third parties, etc., where relevant.</li> </ul>
<b>Site Manager</b>	<ul style="list-style-type: none"> <li>▪ Ensure that all personnel undergo suitable and sufficient environmental induction before starting work on the Designated Development, and periodic refresher environmental awareness training throughout the construction.</li> <li>▪ Ensure staffs attend the appropriate environmental courses that are organised by the Environmental Manager (CEMPC). Ensure the Environmental Manager is maintaining records of training delivered to Site staff.</li> <li>▪ Monitor the performance of personnel and activities under their control and ensure arrangements are in place so that all personnel can work in a manner which minimises risks to them and to the environment.</li> <li>▪ Undertake a programme of regular environmental inspections in liaison with the Environmental Site Representative(s).</li> <li>▪ Complete any corrective actions identified by the Environmental Site Representative(s) and provide status reports as required to CCC.</li> <li>▪ Assist and support the Environmental Manager (CEMPC) and statutory bodies in the investigation of any incidents.</li> <li>▪ Notify the Environmental Site Representative(s) of all environmental issues or incidents arising over the course of operations.</li> </ul>
<b>Environmental Specialists (i.e. Ecological Clerk of Works (ECoW) and Environmental</b>	<ul style="list-style-type: none"> <li>▪ Attend site as required to monitor the protection of asset in accordance with the requirements of relevant legislation, mitigation as outlined within the ER, NIS and any other reports produced for the Designated Development), mitigation measures as outlined within planning conditions, the construction contract, and the CEMP.</li> <li>▪ Identify potential risks to wildlife and develop suitable control measures.</li> <li>▪ Provide status reports and updates to the Environmental Site Representative(s) in the completion of their activities.</li> </ul>

Role	Responsibilities
<b>Clerk of Works (EnvCoW))</b>	<ul style="list-style-type: none"> <li>▪ Provide advice about ecological and environmental and issues during the construction of a development including advice on protected species, pollution, surface water management, material management, air quality and noise.</li> <li>▪ ECoW and EnvCoW roles can be carried out by the same person once they are adequately qualified.</li> </ul>

### 3.3 Checking and Corrective Action

#### 3.3.1 Monitoring

Environmental focused monitoring and inspection activities shall be carried out throughout the lifetime of the Designated Development. The frequency of these monitoring and inspection activities will be agreed in advance of construction with the Applicant and will be in line with planning conditions. Additional monitoring and inspection will take place outside of the agreed frequency where an environmental incident occurs or where activities that can have a significant environmental impact are occurring.

As part of the monitoring process, the appointed contractor will allocate a designated CEMPC / Environmental Site Officer(s), who would be present on-site throughout the construction, including when new activities are commencing. The Environmental Site Officer will observe site activities and report any deviations from the final CEMP in a logbook, along with the action taken and general conditions at the time. The Applicant will be informed of any deviations from the final CEMP as soon as possible following identification of such issues. The CEMPC / Environmental Site Officer will also assist the Applicant with day-to-day contact with the relevant planning authority and regulatory agencies such as the EPA.

During construction, the CEMPC / Environmental Site Officer will conduct regular walkover surveys to ensure all requirements of the final CEMP are being met and to monitor compliance. It is anticipated that a daily visual check and a detailed weekly check shall be carried out and these records will be available upon request. Action from these surveys will be documented on an Environmental Action Schedule, discussed with the Site Foreman for programming requirements and issued weekly for actioning.

The CEMPC / Environmental Site Officer will arrange regular formal inspections to ensure the requirements of the final CEMP are being met. After completion of the works, the Environmental Site Officer will conduct a final review.

During the construction phase the following monitoring measures will be considered at a minimum:

- regular inspection of surface water run-off and sediments controls;
- soil sampling to confirm disposal and short-term storage options for excavated soils;
- regular inspection of construction/mitigation measures shall be undertaken e.g., concrete pouring, refuelling etc.;
- dust monitoring and monitoring of dust control measures;
- noise and vibration monitoring and monitoring of noise and vibration control measures;
- surface water monitoring (if required); and
- daily monitoring of general housekeeping onsite.

#### 3.3.2 Auditing

Planned and documented audits (including waste and environmental audits) aimed at evaluating the conformance of the Designated Development will be carried out throughout the construction phase. The frequency of the audits will be agreed in advance with the Applicant. As a minimum this would include;

- weekly site walkover with results presented at the Contractors' regular meetings with the Applicant; and
- dedicated waste audits shall be carried out at a frequency agreed in advance with the relevant planning authority. All waste types and records would be available for review upon request.

The CEMP will be reviewed and audited every 6 months as a minimum and updated in line with current guidance and legislation.

### **3.3.3 Consents and Licences**

All statutory consents and licences required to commence onsite construction activities shall be obtained ahead of works commencing, allowing for the appropriate notice period. It will be the responsibility of the Contractor to ensure all consents and licences required are in place prior to the start of construction.

These will include, but are not limited to:

- site notices;
- construction commencement notices;
- licence to connect to existing utilities (inc. water) and mains sewers, where required;
- abstraction and/or discharge licenses; and
- road opening/closure licences (if applicable).

### **3.3.4 Records**

The CEMPC / Environmental Site Officer will retain records of environmental monitoring and implementation of the final CEMP. This will allow provision of evidence that the final CEMP is being implemented effectively. These records will include:

- an Environmental Action Schedule;
- records of licences, permits and approvals;
- results of inspections;
- other environmental surveys and investigations; and
- environmental equipment test records.

The final CEMP will be a live document and as such updated regularly, with a full review on at least a quarterly basis throughout construction.

## **3.4 Management Review**

The final CEMP will be signed off on completion of the construction works. The operator of the Designated Development Site will then implement and maintain an Environment Management System (EMS).



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# Appendix A Framework Resource and Waste Management Plan (RWMP)

## A.1 Introduction

This Framework Resource and Waste Management Plan (Outline RWMP) has been prepared at a stage when exact quantities and volumes of waste material have not yet been determined. This document is considered to be live and is to be updated by the Contractor in accordance with the relevant guidance (Environmental Protection Agency (EPA) *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects, 2021*<sup>7</sup> (herein referred to as the 'RWMP Guidelines')).

This Framework RWMP will be updated by the Contractor into a Contractor's Resource and Waste Management Plan prior to commencement of works and will be part of the Contractor's CEMP. The construction stage RWMP will be produced by the Contractor and submission and approval of the final RWMP prior to commencement of construction is proposed to be secured by a condition.

This Framework RWMP has been developed to act as a guide for site staff on how to manage construction materials and waste, in accordance with both legal and best practice requirements.

This Framework RWMP does not replace the requirement for the completion of a construction phase RWMP. The Framework RWMP presents the approach that would be adopted as a minimum throughout construction and forms a framework for the approach of the construction stage RWMP.

RWMPs are used as a good practice measure on construction projects and to support planning and consenting applications. This outline RWMP has been developed to act as a guide for site staff on how to manage construction materials and waste, in accordance with both legal and best practice requirements. The Contractor will use this framework RWMP as a framework for producing the RWMP for use throughout the duration of the Designated Development construction phase.

It is anticipated that some of the required information will not be available until the detailed design phase, such as commitments, target setting, design approach and designing out waste strategies. It shall be the responsibility of the Contractor to update the RWMP once this information becomes available.

Sections related to the commitment to responsibilities, auditing, training, reporting, tracking, supply chain, etc. shall be set up and refined by the Contractor prior to commencement of works.

In developing the RWMP, the Contractor will re-use materials where practicable, where permitted under the relevant waste legislation, and where the material meets engineering requirements. The methods outlined in *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites* (2009) will be taken into consideration in order to maintain the quality of moved and stored soils and minimise impacts on soil structure and quality. Vermin control will also be implemented by the Contractor.

## A.2 Waste Management Legislation and Policy Context

The Contractor must ensure that the Contractor's RWMP is updated to reflect current legal requirements and the waste management practices of the Designated Development as necessary, both prior to and during the construction works. The Contractor must ensure all required authorisations are obtained.

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<sup>7</sup> Environmental Protection Agency (EPA), 2021. *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects*. Available at: <https://www.epa.ie/publications/circular-economy/resources/CDWasteGuidelines.pdf>

The following information is reproduced from the RWMP Guidelines<sup>8</sup>.

The European Waste Framework Directive (Directive 2008/98/EC),<sup>9</sup> as amended by Directive (EU) 2018/851<sup>10</sup> (Waste FD) sets the basic concepts and definitions related to waste management, such as definitions of waste, recycling and recovery. It also includes definitions for when waste ceases to be waste and becomes a secondary raw material (end-of-waste criteria) and how to distinguish between waste and a by-product. The Waste FD is enacted in Ireland under European Communities (Waste Directive) Regulations 2011.<sup>11</sup>

Waste is defined by Article 1(a) of the Waste FD<sup>9</sup> as “*any substance or object (in the categories set out in Annex I) which the holder discards or intends or is required to discard*”.

The legal definition of waste also covers substances or objects, which fall outside of the commercial cycle or out of the chain of utility. In particular, most items that are sold or taken off-site for recycling are wastes, as they require treatment before they can be resold or reused.

In practical terms, wastes include surplus earthworks materials and soil, scrap, unwanted surplus materials, packaging, recovered spills, office waste, and damaged, worn-out, contaminated or otherwise spoiled plant, equipment and materials.

In Ireland, the primary waste legislation is the Waste Management Act 1996,<sup>12</sup> as amended, and Section 32 of the Act places a general obligation on the holder of waste to comply with legislation and ensure all wastes are managed within the requirements of the Act. In short, the obligation to manage waste legally lies with the holder of waste, which means the waste producer or the person who is in possession of the waste. At a construction site, the mandatory obligation to appropriately manage waste generated at a construction site lies with the Client and the Principal Contractor.

Under Section 3(1) of the Act,<sup>12</sup> the requirements do not apply to the following materials, which hence are not considered ‘waste’:

- Land (in-situ) including unexcavated contaminated soil and buildings permanently connected with land – relates to land and buildings prior to any construction or demolition where material remains untouched. Once it has been excavated or otherwise removed, the material may enter into the control regime set down by the Waste Management Act.
- Uncontaminated soil and other naturally occurring material excavated in the course of construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the site from which it was excavated.

In addition, there are two important provisions within the European Communities (Waste Directive) Regulations 2011<sup>11</sup> that are of relevance to the construction sector and the prevention of waste and these allow for the classification of resources out of the waste regime as follows:

- Article 27 allows for the notification of a material as a by-product rather than a waste where certain criteria can be demonstrated by the legal person (i.e. further use is certain, no need for further processing, produced as part of a process and further use is lawful).

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<sup>8</sup> EPA (2021). *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects*.

<sup>9</sup> The European Parliament and The Council of the European Union, 2008. *Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives*.

<sup>10</sup> European Union, 2018. *Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste*.

<sup>11</sup> Government of Ireland (2011). *S.I. No. 126/2011 - European Communities (Waste Directive) Regulations 2011*.

<sup>12</sup> Government of Ireland (1996). *Waste Management Act 1996*.

- Article 28 sets out the grounds by which a material, which is recovered or recycled from waste, can be deemed to be no longer a waste and complies with a set of end-of-waste criteria (substance / object to be used for specific purposes, a market or demand exists, fulfils technical requirements and no overall adverse impact to human health or the environment).

## Policy

A Waste Action Plan for a Circular Economy, Ireland's National Waste Policy 2022-2025<sup>13</sup> sets out Ireland's approach to transitioning to a circular economy.

For construction and demolition (C&D) waste, the plan supports the provisions and targets of the European Communities (Waste Directive) Regulations 2011<sup>11</sup> 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.

The Plan 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 commenced in 2021 and will be informed by the outcomes of this evaluation.

For the purposes of waste management planning, Ireland is divided into three regions. The Designated Development is located within the Southern Region and the Southern Region Waste Management Plan 2015-2021 provides the framework for the prevention and management of wastes in a safe and sustainable manner.

## A.3 Waste and Recycling Targets

The environmental assessment of the Designated Development is based on it achieving certain performance standards with respect to the recovery of C&D waste.

Member States such as Ireland must ensure that the preparation for reuse, recycling, and other material recovery of non-hazardous C&D waste (excluding naturally occurring material defined in List of Waste category 17 05 04) is a minimum of 70% by weight. The Waste FD specifies that this target should be achieved by preparing for reuse, recycling, and other material recovery, including backfilling operations using waste to substitute other material. However, as outlined in the RWMP Guidelines,<sup>14</sup> the Waste FD C&D recovery target is designed for national statistics and is not an appropriate target for individual projects.

As outlined in the RWMP Guidelines the responsibility for setting any project target lies with the Client who may dictate the appropriate performance specification for the project through imposing mandatory contractual obligations on the Contractor. Clients and Design Teams are recommended to reference the relevant industry practice, design standards and certification schemes in setting any project-specific target for the Contractor.

The following can be taken into consideration when setting waste targets:

- Standard, good, and best practice recovery rates by material are provided by WRAP.<sup>15</sup> Recovery rates for key construction materials and other construction wastes relevant to the Project are provided in **Table A-1** below.
- The EPA's 'Progress to EU Targets'<sup>16</sup> reports Ireland's performance against targets set out in European Directives shows performance of 84% was reported for 2019, exceeding the 70% target.

<sup>13</sup> Government of Ireland (2020). *Waste Action Plan for a Circular Economy, Ireland's National Waste Policy 2022-2025*.

<sup>14</sup> EPA 2021. *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects*.

<sup>15</sup> WRAP, 2007. *Waste Recovery Quick Wins. Improving Recovery Rates without Increasing Costs*. No longer available online.

<sup>16</sup> Environmental Protection Agency, 2021. *Progress to EU Waste Targets*. 1 December 2021.

**Table A-1: 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	Limited information	70	95
Cement	Limited information	75	95
Liquids and oils	100	100	100
Hazardous	50	Limited information, cannot be 100% since some hazardous waste e.g., asbestos must be landfilled.	

## A.4 Indicative Roles and Responsibilities

The main RWMP roles and responsibilities as outlined in the RWMP Guidelines are shown in **Table A-2**. The Contractor will complete and add any additional roles to **Table A-2** prior to the commencement of the construction phase.

**Table A-2: Roles and Responsibilities**

Position	Name	Contact Details	RWMP Responsibility
Client Advisory Team (e.g., Engineers, architects, consultants etc.) Project Manager			<ul style="list-style-type: none"> <li>Drafting and maintaining the RWMP through the design, planning and procurement phases of the project.</li> <li>Appointing a Resource Manager (RM) to track and document the design process, inform the Design Team, and prepare the RWMP.</li> <li>Include details and estimated quantities of all projected waste streams. This should also include data on waste types (e.g., waste characterisation data, contaminated land assessments, site investigation information) and prevention mechanisms (such as by-products) to illustrate the positive circular economy principles applied by the Design Team.</li> <li>Incorporate relevant conditions imposed in the planning permission into the RWMP.</li> <li>Handover of the RWMP to the Contractor at commencement of construction for the development of the RWMP in a similar fashion to how the safety file is handed over to the Contractor.</li> <li>Work with the Contractor as required to meet the performance targets for the project.</li> </ul>
Client Project Manager			<ul style="list-style-type: none"> <li>Establishing the ambition and the performance targets for the project.</li> <li>Set out these commitments and targets in relation to prevention and minimisation in the project brief, tendering documentation including pre-qualification requirements, invitation to tender, etc.</li> <li>Require the preparation and submission of an updated RWMP as part of the construction process.</li> <li>Ensure that the RWMP is agreed and submitted to the Applicant prior to commencement of works on-site.</li> <li>Request the end-of-project RWMP from the Contractor.</li> </ul>
Contactour Project Manager			<ul style="list-style-type: none"> <li>Preparing, implementing, and reviewing the RWMP through construction (including the management of all suppliers and sub-contractors) as per the requirements of these guidelines.</li> </ul>

Position	Name	Contact Details	RWMP Responsibility
			<ul style="list-style-type: none"> <li>Identifying a designated and suitably qualified RM who will be responsible for implementing the RWMP.</li> <li>Identifying all hauliers to be engaged to transport each of the resources / wastes off-site. Note that any resource that is legally a 'waste' must only be transported by a haulier with a valid Waste Collection Permit.</li> <li>Identifying all destinations for resources taken off-site.</li> <li>End-of-waste and by-product notifications addressed with EPA where required.</li> <li>Clarification of any other statutory waste management obligations, which could include on-site processing.</li> <li>Full records of all resources (both wastes and other resources) should be maintained for the duration of the project.</li> <li>Preparing a RWMP Implementation Review Report at project handover.</li> </ul>

## A.5 Approach to Waste Management

The Applicant is committed to delivering a development that is sustainable in regard to matters relating to waste management and will comply with the relevant statutory requirements. This requirement will be passed onto the Contractor. Decisions made at the detailed design stage of the Designated Development will impact on the quantity and types of materials used, the quantity and types of waste arising and the management of materials and waste.

Waste elimination will start as early as possible, and the Contractor and their design team will work in conjunction with the Applicant to design and plan waste minimisation. The Designated Development's design development has and will continue to apply the principles of Designing out Waste (DoW), which include:

- Design for reuse and recycling;
- Design for green procurement;
- Design for off-site construction;
- Design for materials optimisation; and
- Design for deconstruction and flexibility.

The proposed construction phase RWMP will identify the types and quantities of waste anticipated to be generated, along with the definition of suitable disposal routes. The construction phase RWMP will also include details as to how material reuse and recycling options will be maximised. The construction phase RWMP will be maintained as a live document, to be updated and monitored by the Contractor, in order to demonstrate compliance with the Waste Duty of Care and other relevant regulations.

The RWMP will require that the Contractor segregates waste streams on-site, prior to them being taken to a waste facility for recycling or disposal. All waste removal from the Site will be undertaken by fully licensed waste carriers and taken to permitted waste facilities.

Prior to construction, the Contractor must record, in the contractor RWMP, all actions to be implemented to reduce waste or material use on the Designated Development, and the resulting benefits.

In general, the following measures shall be considered during the design and construction phases of the Designated Development, where technically, economically, and environmentally practicable:

- designing the Designated Development in a manner that facilitates the reuse of acceptable material arisings, for example those associated with earthworks and other excavations;
- achieving an earthworks balance (cut and fill material) within the design of the Designated Development, where possible, to minimise the need to import and export material;

- the inclusion of land within the Designated Development boundary for the temporary on-site storage of soils, excavated materials and other materials;
- the appropriate sizing of construction compounds to enable the segregation and storage of waste, and to facilitate off-site recovery;
- the retention of existing infrastructure within the Designated Development design where feasible, to minimise the need for the demolition of components and infrastructure and the associated generation of waste material;
- the reuse of excavated materials and the recycling of demolition and construction materials within the Designated Development, where practicable, to minimise the need to import and export material;
- the optimisation of designs through the incorporation of precast concrete elements to reduce on-site waste arisings;
- importing alternative (recycled and secondary) aggregate materials during construction, where practicable, 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.

#### Waste Types and Actions

At this stage it is not possible to confirm the anticipated type and estimated volumes of waste to be produced from construction. **Table A-3** provides a summary of the anticipated waste types and how each waste type is expected to be managed to reduce adverse impacts.

**Table A-3: Waste Types and Management**

Waste Type	Main Management Process
Soil arisings	Reuse on-site where appropriate, remediate where necessary.
Concrete, masonry, and aggregates	Crush and reuse, investigate potential for off-site use.
Metals	Recycle via appropriate waste carrier.
Paper and cardboard	Segregate and recycle via appropriate waste carrier.
Sanitary waste	Remove by specialist waste contractor.
Plastics and glass	Recycle via appropriate waste carrier.

A further source of construction waste would relate to packaging waste associated with materials used during construction.

Any excess spoil generated during construction will be managed through the RWMP that would form part of the final CEMP. Spoil which cannot be re-used will be removed from site for re-use, treatment, or disposal at a permitted facility. The re-use of excavated materials during construction will be governed by relevant legislation and guidance such as Regulation 27 of the European Communities (Waste Directive) Regulations 2011, as amended and Article 28 of the European Communities (Waste Directive) Regulations 2011, as amended, as well as any other relevant legislation and guidance.

#### Management of Excavated Materials

The Contractor will set out within the RWMP, their proposal for the management and re-use of any excavated materials on or off site, where permitted in accordance with the relevant legislation.

Where the Contractor proposes to maximise the re-use of any excavated material in order to minimise the generation of waste, it will set out how it proposes to manage and document this re-use and will be carried out in line with all relevant legislation and guidance.

The Contractor will establish the controls necessary to manage the generation, handling, and storage of waste at the Site.

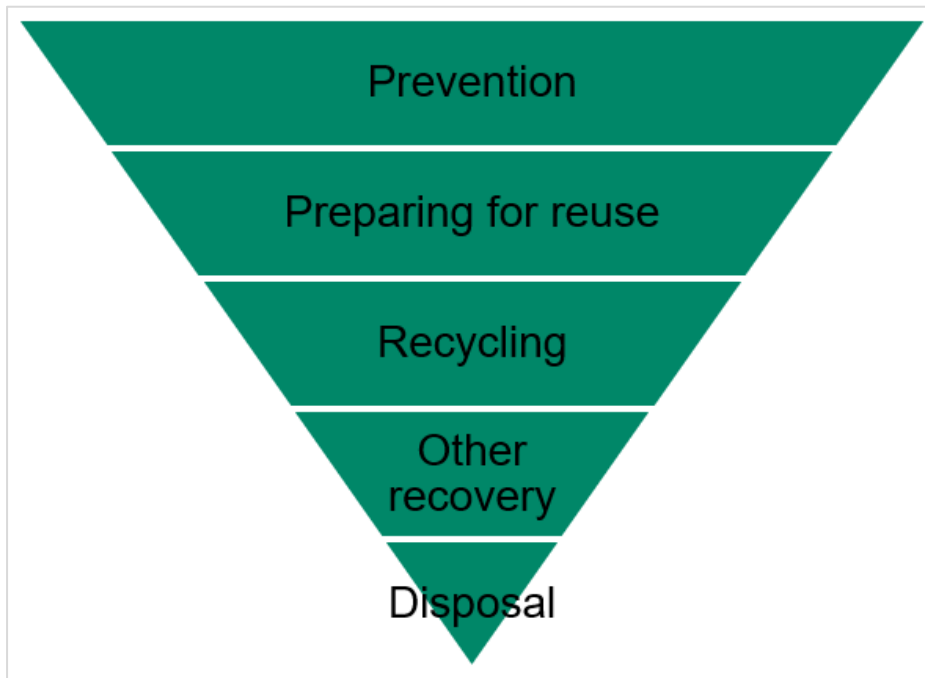
These controls may rely on the other plans within the CEMP, for example the protection of stockpiles against rainwater ingress and leachate runoff, the bunding of hazardous waste storage areas containing liquids (e.g., oils, paints), and the management of waste collection vehicles both within and when leaving the Site (dust and noise).

#### Waste Minimisation Actions and Mitigation

The Waste Hierarchy sets out the priority order that should be considered when managing wastes. A basic representation is provided in Plate A.1 shows the waste hierarchy. The Principal Contractor will use the Waste Hierarchy as a guide to encourage the prevention of waste and to define waste management options.

When considering waste management options for the Designated Development, the Principal Contractor will take account of the site's location, natural environment, and available infrastructure. The Principal Contractor will consider the following options when determining the preferred waste management option for each waste stream.

**Plate A.1: The Waste Hierarchy<sup>17</sup>**



The aim of prevention and preparing for reuse is to reduce the potential impacts from materials and waste, and to achieve high levels of sustainability in the Designated Development as a whole. The Principal Contractor will apply the principles of the Waste Hierarchy and adopt best practice measures (BPM) which go beyond statutory compliance.

This may include BPMs set out in construction industry guidance for example, guidance from the Considerate Constructors Scheme (CCS), Waste & Resources Action Programme (WRAP) and Construction Industry Research and Information Association (CIRIA).

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<sup>17</sup> European Commission (2022). Waste Framework Directive.



Recycling aims to reuse materials won on-site by recycling them into an alternative form that can be used for construction purposes (for example crushing concrete, brick, or other inert wastes to produce aggregate material). By recycling on-site, as far as practicable, the quantity of waste requiring off-site management is reduced and carbon emissions associated with transportation are eliminated. Recycling may also be achieved by utilising materials with a recycled content, such as recycled aggregates produced off-site.

Recovery generally aims to recover energy from waste which cannot otherwise be reused or recycled. This may include waste materials such as hazardous liquids or solids that can be sent to energy from waste facilities. Recovery may also include the beneficial use of materials on land for restoration (backfilling operations).

The least preferred option in the Waste Hierarchy is a final disposal route such as landfill. Some waste streams will inevitably end up with such a solution. When placing waste disposal contracts, the Principal Contractor will consider the implications of long-distance travel in terms of health and safety risk, commercial terms, and increased emissions from vehicles.

Waste minimisation actions relating to site generated construction waste will include consideration of:

- agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme;
- implementation of a 'just-in-time' material delivery system, as far as reasonably practical, to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste;
- attention to material quantity requirements to avoid over-ordering and generation of waste materials;
- Wherever possible, leftover materials (e.g., timber off cuts) and any suitable demolition materials shall be reused on-site;
- segregation of waste at source where practical; and
- re-use and recycling and recovery of materials and waste off-site where re-use on-site is not practical (e.g., through use of an off-site waste segregation or treatment facility and re-sale for direct re-use or re-processing off-site).
- Facilitate recycling and appropriate disposal by on site segregation of all waste materials generated during construction into appropriate categories, including:
  - Topsoil, subsoil, gravel hard-core
  - Concrete, bricks, tile, ceramics, plasterboard
  - Asphalt, tar, and tar products
  - Metals
  - Dry Recyclables e.g., cardboard, plastic, timber.
- All waste assessed as 'not suitable for reuse' shall be stored in skips or other suitable receptacles in a designated area of the site, to prevent cross contamination between waste streams, dispersion, and leaching;
- Uncontaminated excavated material (top-soil, sub soil, etc.) shall be segregated, stockpiled, and reused on site in preference to importation of clean fill, where possible;
- If excavated material cannot be used on site, the potential for its transfer to another site under, for example, Article 27 of the European Communities (Waste Directive) Regulations 2011 should be explored;

- Where possible, the Contractor shall ensure that all waste leaving site will be recycled or recovered.

#### Additional Actions for Dealing with Waste

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.

In addition to the waste management measures as detailed in the 'Approach to Waste Management' section above, there are actions that will be introduced as part of the construction RWMP which would contribute to the general reduction of waste generation during construction, including:

- appointment of an CECMPC/Environmental Site Officer who will hold overall responsibility for waste management, coordinate all waste and environmental issues on-site, monitor waste data and identify training needs. Sites with such personnel tend to perform better in managing waste;
- accurate record keeping of waste types, volumes and disposal routes and destinations;
- staff awareness training to ensure all personnel know the correct procedures on-site for waste segregation, disposal and actively promote recycling on-site through clear signage;
- setting of targets/ Key Performance Indicators (KPIs) for waste recycling and reduction; and
- establishing a good management structure, which will allow prompt decision making relating to improvements in waste management and recycling initiatives.

## **A.6 Waste Identification, Classification, Quantification and Handling**

Waste arising for the project shall be segregated, identified, and classified by the contractor in accordance with applicable waste regulations and guidance.

Wastes shall not be removed from the site until properly classified, assigned a correct LoW code and all appropriate tracking and disposal documentation is in place.

For each waste stream identified and classified, and for each waste stream that may arise during the course of the works, the following shall be identified and documented by the Contractor in their RWMP:

- an appropriate waste classification and correct LoW code; the classification of materials as non-hazardous and/or hazardous waste will be determined in accordance with EPA (2018) Guidance "Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-hazardous" using the [www.hazwasteonline.com](http://www.hazwasteonline.com) web-based waste assessment system (as recognized by the Environmental Protection Agency) and using Waste Acceptance Criteria in accordance with the European Communities (EC) Council Decision 2003/33/EC, which establishes criteria for the acceptance of waste at landfills;
- a suitable Waste Collection Contractor in possession of a valid Waste Collection Permit for the collection of waste within the Kerry County Council area;
- appropriate waste recovery, recycling, or disposal facilities, including any required transfer stations whereupon the said facilities shall be in possession of a valid Waste Facility Certificate of Registration, permit or Waste License, as appropriate.

Where any material is being recovered onsite or offsite for reuse, the Contractor shall provide confirmation of any application to the EPA under Article 27 or Article 28 to classify material as a by-product or as end-of-life waste respectively; and final reconciled waste quantities generated, including details of waste disposal, reuse, and recovery quantities.

The Applicant will require that the contractor segregates waste streams on-site, prior to them being taken to a waste facility for recycling or disposal.

## A.7 Segregation and Storage

The following minimum segregation and storage strategy requirements shall be adhered to:

- waste streams shall be individually segregated; and all segregation, storage & stockpiling locations will be clearly delineated on site drawings. At the waste storage areas, the Contractor must segregate waste into the following types as a minimum: inert; wood; metals; packaging; general waste; hazardous solid wastes; hazardous liquid wastes. All containers within the storage area will be clearly labelled so that appropriate remedial action can be taken in the event of a spillage;
- waste storage, fuel storage, stockpiling and movement are to be undertaken with a view to protecting any essential services (electricity, gas, water) and with a view to protecting environmentally sensitive areas (e.g., watercourses, ditches, treelines, hedgerows) and existing localised groundwater quality boreholes (if applicable);
- contaminated or potentially contaminated soil shall be stockpiled only on hard-standing or high-grade polythene sheeting to prevent cross-contamination of the soil below and should be located away from watercourses, drainage systems, ditches etc.;
- roles and responsibilities of those managing the segregation and storage areas shall be identified;
- the waste storage area should contain suitably sized containers for each waste stream. The number and sizing of containers shall be agreed with the waste Contractors in advance of the commencement of the project;
- all segregation and waste storage areas shall be inspected regularly by the appointed Resource Manager;
- waste shall be stored on site, including metals, asphalt, and soil stockpiles, in such a manner as to:
  - prevent environmental pollution (bunded and/or covered storage, minimise noise generation and implement dust/odour/pest control measures, as may be required);
  - maximise waste segregation to minimise potential cross contamination of waste streams and facilitate subsequent reuse, recycling, and recovery; and
  - prevent hazards to site workers and the general public during construction phase (largely noise, vibration, dust, and pests).
- construction materials that are stored on-site must be in designated areas that are flat, accessible, and secure in order to avoid damage or loss. Materials must be stored in appropriate conditions to avoid damage through, for example, water ingress or vermin. Materials must be retained in their original packaging to protect them from damage.
- the Contractor must ensure that the construction site compounds incorporate designated waste storage areas for skips or similar suitable waste receptacles. The Contractor must ensure that these areas are surfaced with an impermeable barrier, such as hardstanding/tarmac or using impermeable membranes; should be suitably contained, bunded or defined as required; and the location of any existing drainage will be noted.
- the Contractor shall ensure containers are clearly labelled using a colour coding system so that users know what wastes can be placed in each container. Waste containers must be appropriately colour coded using generic colour codes, an example is shown in **Figure A.2**.

- lockable storage shall be provided for all hazardous waste.
- all waste containers must be sited at least 50m away from watercourses, ditches, drains and other areas of environmental sensitivity.
- liquid wastes must be stored in enclosed/lidded containers and stored within a suitable bunded area, or otherwise provided with secondary containment.
- separate containers must be provided for each type of hazardous waste.
- each type of hazardous waste must not be mixed with any other hazardous or non-hazardous waste.

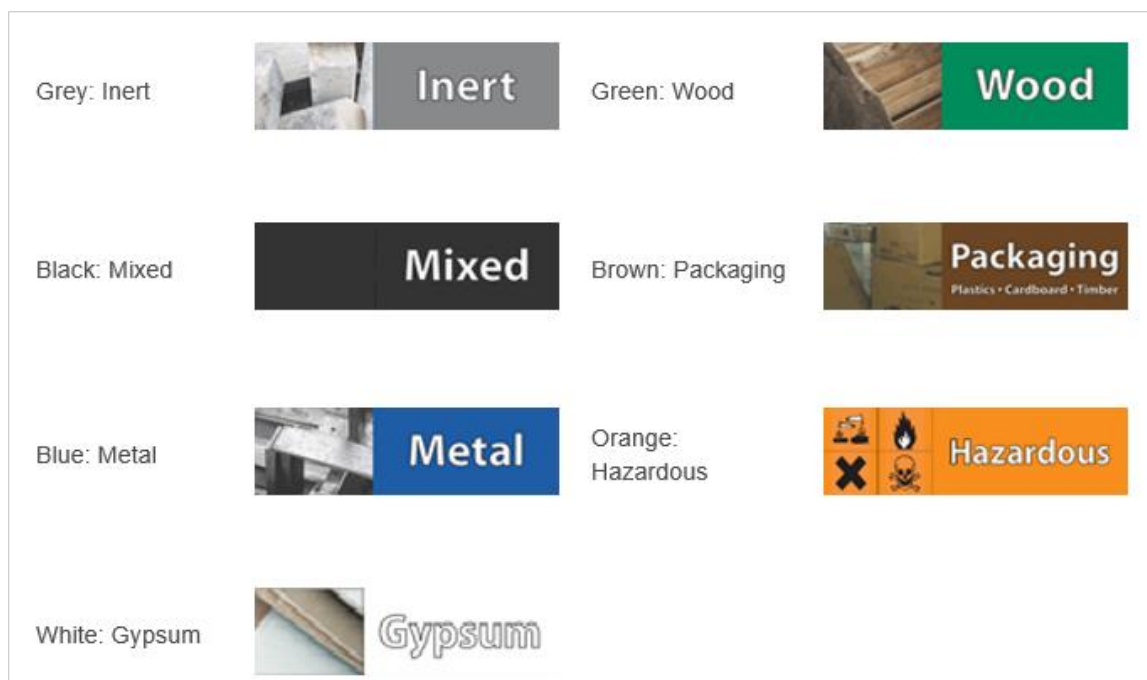


Figure A.2: Example of Waste Container Colour Codes

## A.8 Documentation of Waste

The Contractor will develop a Waste Documentation System within the overall documentation system for the works in accordance with the *Best Practice Guidelines for The Preparation of Resource Management Plans for Construction & Demolition Projects* (EPA, 2021). The documentation to be maintained in relation to wastes includes the following (where applicable):

- the names of the agent(s) and the transporter(s) of the wastes and hold a copy of associated waste collection permits;
- the name(s) of the person(s) responsible for the ultimate recovery or disposal of the wastes, and hold a copy of associated waste facility permits and licences;
- the ultimate destination(s) of the wastes;
- written confirmation of the acceptance and recovery or disposal of any hazardous waste consignments;
- the tonnages and EWC (European Waste Catalogue) Code for the waste materials;
- details of any rejected consignments;
- the Waste Transfer Forms for hazardous wastes transferred from the Site; and

- the Certificates of Recycling, Re-use or Disposal for all wastes transferred from the Site.

## A.9 Audit Monitoring and Review

To be most effective, it is important that the construction phase RWMP is a live document which, like the Final / Contractor's CEMP, is regularly reviewed and updated. Waste will be monitored routinely through regular site inspections (weekly at a minimum). Monitoring of waste and implementation of waste management plans will assist in achieving waste minimisation obligations, as detailed within the construction phase RWMP as well as helping to identify opportunities for improvements and potential cost reductions.

The following is not an exhaustive list and represents typical activities undertaken at each stage.

Waste monitoring, including:

- updating the construction phase RWMP at regular intervals to illustrate changes to the Site, such as waste types, volumes, sub-contractors, and changes in personnel and to drive continual improvement in promoting management of wastes as high up the waste hierarchy as possible;
- monitoring compliance with relevant legislation and regulations and checking that the construction phase RWMP is being implemented appropriately, monitored through regular (weekly at a minimum) site inspections;
- completing monthly logs detailing the volume of material brought on-site and the volume of waste generated, including the type and route of disposal/ recovery; and
- collating monthly data detailing all waste movements into a quarterly report to be submitted to the Environmental Site Officer for use during the annual waste audit and waste review.

Waste auditing (undertaken annually as a minimum), including collating/ reviewing:

- operations/ staffing levels, composition, waste monitoring reports and quantity of waste generated;
- current waste management procedures;
- existing activities including, for example, key roles and responsibilities; and
- an estimation of waste volumes including a comparison from previous and projected years (where appropriate);

The results of the waste audit will be used to inform the waste review.

A waste review would be undertaken following the completion of a waste audit and the completion of regular waste monitoring. The review would provide an opportunity to consider the suitability of the management strategies that are in place in relation to relevant regulations and best practice procedures, and identify areas for improvement, lessons to be learnt and improved cost saving and sustainability; and the review would consider monthly, quarterly, and annual reports, compare waste related data that has been collected and include guidance and proposals to drive continual improvement.

The monitoring procedures detailed above will be undertaken as a minimum and defined within the construction phase RWMP.

## A.10 Conclusion and Summary

This Framework RWMP presents the approach that will be implemented during the construction phase.

This Plan illustrates and seeks to guide the Contractor and Applicant to:

- recognise that the construction phase RWMP will underpin the approach to waste management for the Designated Development construction phase;
- define indicative roles and responsibilities within the organisations to ensure those responsible for waste management are aware of their remit;
- demonstrate that key waste legislation will be met, and local and regional drivers will be fulfilled, including reviewing procedures should waste legislation and guidance be amended or updated in future;
- demonstrate that the construction phase will minimise waste as far as reasonably practicable in accordance with best practice via the implementation of a construction phase RWMP;
- develop a proactive and coordinated approach to sustainable waste management, reuse and recycling that will be encouraged and implemented at the Site through a number of recycling initiatives to divert as much recyclable waste as possible from landfill; and
- record and audit waste movement during construction

Where individual waste types have not been identified within this Framework RWMP, these will be assessed in the construction phase RWMP.

# **Appendix C Framework Construction Traffic Management Plan (CTMP)**

# Temporary Emergency Generation Power Plant - Tarbert Power Station

Framework Construction Traffic Management Plan (CTMP)

SSE Generation Ireland Limited

February 2023



## Quality information

<u>Prepared by</u>	<u>Checked by</u>	<u>Verified by</u>	<u>Approved by</u>
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## Revision History

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# 1. Introduction

## 1.1 Background

AECOM have been commissioned by SSE Generation Ireland Limited (SSE), to provide a Framework Construction Traffic Management Plan to accompany the proposals for a temporary emergency generation power plant at Tarbert Power Station, Co. Kerry ('the Site').

The existing Tarbert Power Station Site contains electricity generating, transmission and fuel storage infrastructure.

## 1.2 Site Location

The Designated Development Site is situated north of Tarbert, Co. Kerry, Ireland (Irish Grid Reference X: 107161; Y: 212865). The entire Site is located within the administrative area of Kerry County Council (KCC).

The Site on which the Designated Development will be located is to the immediate west of the existing Tarbert Power Station. The location of Tarbert Power Station is shown in Figure 1.



**Figure 1: Site Location** Source: Google Maps, 2022

The Site will be accessed via the N67 to the southeast, which also serves the existing Power Station and the Tarbert-Killimer Ferry Terminal. The N67 connects the Site to the N69 Tralee / Limerick Road, located approximately 1.8km to the south.

## 2. Designated Development

The Designated Development consists of the installation of three units which will collectively generate 150MW of temporary emergency electricity, site development and associated ancillary works required for the operation of the plant. The plant will operate as 'emergency generators', with a maximum running time of 500 hours per annum, spending the majority of time on standby, and will be run to complement renewable power generation sources.

The objective of the project is to facilitate and ensure security of supply and provide support to the electricity network during periods when there is a gap between the renewable power generation and power demand.

The three LM6000 units have been selected for development as they are able to respond to changes in electricity demand by starting up quickly and achieving full output within approximately twenty minutes.

With regard to the operational phase, it is anticipated that the Designated Development will have a design life of five years. At the end of the design life, the Designated Development will be decommissioned, dismantled, and removed from this Site. Decommissioning of the asset would therefore be expected to commence at some point during the period of 2027 and 2028.

The Designated Development will comprise the following main components, all of which will be transported to the site via road:

- 3 No. 50 MW Gas Turbine generators
- 3 No. Exhaust stacks – 30m tall
- 3 No. Fin fan Coolers with several control modules
- 6 No. Fuel oil tanks (80m<sup>3</sup>) (containerised).
- 6 No. Containerised switchgear and control modules.
- 1 No. Fuel oil drain tank for filter change over.
- 3 No. Fuel oil storage tanks (1000m<sup>3</sup>).
- 2 No. Demineralisation treatment units.
- 1 No. Demineralisation water storage tanks (1320m<sup>3</sup>).
- 1 No. Raw and Fire water storage tank (2500m<sup>3</sup>).
- 2 No. Distillate fuel unloading and forwarding.
- 2 No. Pre Filters.
- 1 No. Coalescer Filter.
- 3 No. Fuel oil heaters.
- Instrument air compressors.
- 3 No. Generator circuit breakers.
- 2 No. Generator step-up transformers.
- 1 No. Administration building.
- 1 No. 220kV substation, and
- Circa. 560m underground cable to connect to an existing onsite 220kV substation

The construction phase of the Designated Development will comprise:

- temporary construction and laydown areas comprising hardstanding, laydown, and open storage areas;
  - temporary facilities and stores;
  - materials and plant storage;
  - contractor compound and construction staff office and welfare facilities;
  - temporary vehicle parking facilities; and
  - signage.

In connection with and in addition to the above, the following infrastructure will be included:

- internal roads;
- external lighting, including lighting columns;
- security fencing and gates; and
- utilities, pipes, cables and connection to surface water drainage systems, oil-water separators, including channelling, culverting, crossings and works to existing drainage systems.

### 3. Framework Construction Traffic Management Plan

#### 3.1 General

A CTMP is a framework document for ensuring work activities in, near or having impact upon the public highway, are undertaken safely and with minimal impact on traffic movement and existing infrastructure throughout the works programme.

The CTMP is a live ‘working’ document that will be responsive to changing construction activities throughout the works. It is likely that the programme of works will stretch beyond completion of construction and commissioning activities. The CTMP will cover this and may also be extended to form part of the operation and maintenance plan component of the Safety File. The CTMP will only cease to be a working document on full completion of the works.

This Framework CTMP deals directly with the impacts of construction of the subject development. As with any construction project, the appointed contractor will be required to prepare a comprehensive CTMP for the construction phase which implements in full the measures described herein. The purpose of such a plan is to outline measures to manage the expected construction traffic activity during the construction period.

#### 3.2 Construction Programme and Phasing

The preliminary works are scheduled to commence in March 2023, with initial site access and set up, pre-construction works, ground works, piling and construction of plant equipment. The construction programme and commissioning are expected to be completed within approximately nine months.

A draft construction programme is detailed in Table 1. The contractor will be required to provide a detailed construction programme within the final CTMP.

**Table 1: Indicative Construction Programme**

	Month of Programme								
Task	1	2	3	4	5	6	7	8	9
Site Access - Enabling and Preparation	█								
Groundworks associated with underground services		█	█	█					
Civils Works		█	█	█	█	█	█	█	
Installation of main equipment				█	█	█	█	█	
Electrical Connections			█	█	█	█	█	█	
Commissioning and Testing								█	█

#### 3.3 Construction Route

The contractor will be required to provide detail of any HGV routing in the full CTMP. This will consider where deliveries will be made to/from and what roads will be used.

The Site benefits from direct connection to an N road, and therefore construction vehicles will be routed to use the N road network where possible. The local N roads are shown in Figure 2.



Figure 2: Local N Class Road Network Source: Google Maps, 2022

Although it is unlikely, due to the direct connection to the N road network, if smaller roads are used, a pavement assessment may be required. This will be addressed within the full CTMP.

### 3.4 Parking

There are designated areas provided within the Tarbert Power Station Site for parking and therefore no extraneous parking will take place.

### 3.5 Mitigation Measures

A full CTMP will be developed by the contractor prior to the commencement of work on site and will be prepared in consultation with KCC.

No works shall commence until such time that the full CTMP has been approved by KCC at the Project Supervisor Construction Stage (PSCS). Details of approximate anticipated vehicle volumes (based on similar projects) will be included within this document, however final confirmation on movements will be set out in the full CTMP.

The Contractor will be required to always accommodate and make provision for access and egress to local residential premises, paying particular attention to the provision of pedestrian/disabled/cyclist safe access and egress. The CTMP will include alternative routes for pedestrians and vehicles in the event that public roads or right of ways are closed during works, though this is not expected to be required. The CTMP will include measures to limit the amount of queuing required by construction vehicles outside the site boundaries. This

includes scheduling deliveries to and from the Site to ensure they do not arrive at once. Additionally, HGV drivers will be given designated routes to follow to/from Site.

All licensing and administration matters will be directed through the Roads Department in KCC.

Construction debris, particularly site clearance, spoil removal and dirty water runoff can have a significant impact on footpaths and roads adjoining a construction site, if not adequately addressed. These matters will require to be fully addressed in the contractors CTMP and will require the provision of wheel washing facilities.

### 3.5.1 Site Management

The site activities will be undertaken with due consideration of the surrounding environment and the close proximity of sensitive receptors such as residents and pedestrians. Dust management during the construction phase will be the most important aspect in terms of minimising the impacts of the project on the surrounding air quality. The following measures will be implemented to ensure impacts are minimised:

- Complaint registers will be kept detailing all telephone calls and letters of complaint received in connection with construction activities, together with details of any remedial actions carried out;
- Equipment and vehicles used on site will be in good condition such that emissions from diesel engines etc. are not excessive;
- Pre-start checks will be carried out on equipment to ensure they are operating efficiently and that emission controls installed as part of the equipment are functional;
- Monitoring and control of construction traffic during construction works; and
- The use of prefabricated elements to minimise on site fabrication and assembly thereby reducing the numbers of site operatives required.

Dust deposition levels will be monitored on a regular basis in order to assess the impact that site activities may have on the local ambient air quality. The following procedures will be implemented:

- The dust deposition rate will be measured by positioning Bergerhoff Dust Deposit Gauges at strategic locations near the boundaries of the site for a period of 30 (+/- 2) days if required. Monitoring will be conducted as required during periods when the highest levels of dust are expected to be generated i.e., during site preparation works and soil stripping activities.
- The exact locations will be determined in accordance with the requirements of Method VDI 2119 with respect to the location of the samplers relative to obstructions, height above ground and sample collection and analysis procedures.
- After each 30 (+/- 2 days) exposure period, the gauges will be removed from the sampling location, sealed and the dust deposits in each gauge will be determined gravimetrically by an accredited laboratory and expressed as a dust deposition rate in mg/m<sup>2</sup>/day in accordance with the relevant standards.
- Technical monitoring reports detailing all measurement results, methodologies and assessment of results shall be subsequently prepared and maintained by the Site Manager.

### 3.5.2 Dust Control Measures

The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design, planning and effective control strategies. The siting of construction activities and the limiting of stockpiling will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance. In addition, good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or using effective control measures quickly before the potential for nuisance occurs.

- During working hours, technical staff will be available to monitor dust levels as appropriate; and
- At all times, the dust management procedures put in place will be strictly monitored (these measures will be confirmed in the full CTMP).

The dust minimisation measures will be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust generation. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed, and procedures implemented to rectify the problem. Specific dust control measures to be employed are presented below.



### 3.5.3 Site Routes

Site access routes (particularly unpaved areas) can be a significant source of fugitive dust from construction sites if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions.

- A speed restriction of 20km/hr will be applied as an effective control measure for dust for on-site vehicles or delivery vehicles within the vicinity of the site;
- Bowsers will be available during periods of dry weather throughout the construction period. The bowser will operate during dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use; and
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced areas shall be restricted to essential site traffic only.

### 3.5.4 Excavation

Excavation works during periods of high winds and dry weather conditions can be a significant source of dust, as follows

- During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust; and
- During periods of very high winds (gales), activities likely to generate significant dust emissions will be postponed until the gale has subsided.

The movement of truck containing materials with a potential for dust generation to an off-site location will be enclosed or covered.

### 3.5.5 Stockpiling

The location and moisture content of stockpiles are important factors which determine their potential for dust emissions. The following measures will be put in place:

- Overburden material will be protected from exposure to wind by storing the material in sheltered parts of the Site, where possible;
- Regular watering will take place during dry/windy periods to ensure the moisture content is high enough to increase the stability of the soil and suppress dust
- Should short-term stockpiles be required these will be located at least 50m away from any watercourse. Slopes of these stockpiles will be made stable and regularly checked by the contractor or appointed staff member. Stockpiles shall be stored on impermeable surfaces and covered using tarpaulin.

### 3.5.6 Site Traffic on Public Roads

Spillage and blow-off of debris, aggregates and fine material onto public roads will be reduced to a minimum by employing the following measures:

- Vehicles delivering material with potential for dust emissions to an off-site location shall be enclosed or covered at all times to restrict the escape of dust
- Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only
- A power washing facility or wheel cleaning facility will be installed near to the site compound for use by vehicles exiting the site
- Road sweepers will be employed to clean the site access route as required.

## 3.6 Working Hours

To address the urgent need to install the temporary emergency generation power plant, construction phase works will take place over a minimum of two eight hour shifts and on occasions, three eight hour shifts per day, seven

days a week, during construction and commissioning phases, acting in full compliance with Irish labour and Health and Safety laws.

### 3.7 Traffic Management Measures

Below is a list of the proposed traffic management measures to be adopted during the construction works. Please note that this is not an exhaustive list, and that it will be the appointed contractor's responsibility to prepare a detailed CTMP which implements fully the measures below as a minimum.

- 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;
- 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.
- Temporary signage designating permissible HGV routes;
- Material deliveries and collections from site will be planned, scheduled, and staggered to avoid unnecessary build-up of demolition/construction works related traffic;
- HGV trips will be planned insofar as possible 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 will 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;
- 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;
- 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 roads;
- 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;
- Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footways. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and will be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users including mobility impaired persons; and
- Using Garda escorts for abnormal loads where required (these are likely to travel from Foynes Port, County Limerick), following a route along the N69.

The mitigation measures will ensure that the presence of construction traffic will not lead to any significant environmental degradation or safety concerns in the vicinity of the proposed works. Furthermore, it is in the interests of the construction programme that deliveries, particularly concrete deliveries are not unduly hampered by traffic congestion, and as a result continuous review of haulage routes (likely to be from Foynes Port, County Limerick and follow the N69 for the majority of the journey), delivery timings and access arrangements will be undertaken as construction progresses to ensure smooth operation.

### 3.8 Predicted Construction Traffic

The construction traffic is anticipated to arrive at set designated intervals throughout the day.

The peak work force is predicted to be 200 personnel per day with construction lasting nine months.

It is therefore considered that a maximum of 200 construction staff will travel to site each day. Staff are expected to travel to Site via a combination of carsharing and private passenger vehicles with approximately 50 staff vehicles movements during the peak construction staffing periods.

It is also expected that at peak construction there will be 50 deliveries per week associated with equipment such as concrete mixers and cranes and 15 vehicle arrivals per week associated with the delivery of goods. Based on a five-day working week this equates to a total of 13 HGV daily arrivals (26 two-way trips) associated with the delivery of equipment and goods.

In addition to this, a total of 80 HGV arrivals (160 two-way HGV trips) are expected each day associated with cut and fill.

Once a detailed construction programme is created, the maximum trips per day can be calculated accurately. However, in the absence of this information, it has been assumed that all trips noted above would arrive on one day. The daily arrivals are set out below in Table 2.

**Table 2: Traffic Generation Estimated at Site**

Construction Phase	Staff Arrivals / Day (LGVS)	Good and Equipment Arrivals / Day (HGVs)	Cut and Fill Arrivals / Day (HGVs)	Total Arrival Trips / Day
Peak Construction	50	13	80	143

As shown above in Table 2, there is expected to a worst-case arrival flow of 143 vehicles per day (286 two-way trips). This is split as 50 LGV arrivals (100 two-way) and 93 HGV arrivals (186 two-way trips).

### 3.9 Abnormal Loads

The largest deliveries required for the development are as shown in Tables 3, 4 and 5.

**Table 3: Main Units (for each LM6000)**

Box Description	Length	Width	Height	Net	Gross
Turbine base	913	428	452	45900	47300
Generator base	1128	428	452	46000	47800
Generator	770	410	325	72900	77900
Roof skid	1222	445	379	13360	13560
Aux. Skid	557	372	321	10330	12330
Box description	Length	Width	Height	Net	Gross

**Table 4: Air Filter (for each LM6000 Gas Turbine)**

Description	Quantity	Measurement (unit)	Length (cm)	Width (cm)	Height (cm)	Volume (cum)	Total Net Weight (kg)	Total Gross Weight (kg)
Fabrication, plenum module,	1	PCS	1020	380	440	170.54	13000.00	14800.00
Coil module a	1	PCS	1064	332	403	142.36	15200.00	17000.00
Coil module b	1	PCS	1064	332	403	142.36	15200.00	17000.00
Coil housing	2	PCS	1020	184	412	77.32	8000.00	9000.00

**Table 5: GSUTs (Generator Step Up Transformer)**

		GW	Length (cm)	Width (cm)	Height (cm)	Cbm
160mva	Gw	163,000	9400	4600	3730	161.2852
	Accessories	130,340				254.9496
80mva	Gw	102,000	9650	4240	3830	156.71
	Accessories	101,186				442.2773

The final CTMP will provide the following information with regards to abnormal loads:

- Identify which loads above are considered 'abnormal loads' and quantify the total number of trips required for their delivery;
- Identify what vehicles will be used to transport the equipment; and
- Inform of the dates that the deliveries will be made on.

KCC will be informed of and approve any abnormal load movement before they take place as these may require road closures or other temporary traffic management measures (temporary traffic lights).

**Appendix D Requirement for Regulation  
3 (4) of S.I. No. 719 of 2022**

Temporary Emergency Generation Power Plant  
 Tarbert Power Station

An application shall, to the extent that information is reasonably available to the applicant at the time of the application, include the following:

**Table A2: Regulation 3 (4) of S.I. No. 719 of 2022**

<b>Requirement</b>	<b>Where / How Addressed</b>
(a) <i>name, address and contact details of the applicant;</i>	SSE Generation Ireland Limited Red Oak South South County Business Park Leopardstown Dublin 18, Dublin Contact: James Moran Email: <a href="mailto:thermalenquiries@sse.com">thermalenquiries@sse.com</a>
(b) <i>a description of the designated development;</i>	<b>Section 2.3</b> of the <i>Temporary Emergency Generation Power Plant, Tarbert Power Station, Environmental Report</i> (AECOM, 2023), outlines the description of the Designated Development.
(c) <i>a description of the location of the designated development;</i>	<b>Section 2.2</b> of the <i>Temporary Emergency Generation Power Plant, Tarbert Power Station, Environmental Report</i> (AECOM, 2023), provides the description of the location of the Designated Development.
(d) <i>a copy of the newspaper notice referred to in Regulation 4;</i>	A copy of the newspaper notice is included separately in the application documentation.
(e) <i>a site location map sufficient to identify the land on which the designated development would be situated;</i>	<b>Figure 1 Site Location Map</b> of the <i>Temporary Emergency Generation Power Plant, Tarbert Power Station, Environmental Report</i> (AECOM, 2023), is shown the site location map.
(f) <i>a site or layout plan on which the site boundary of the designated development shall be clearly delineated;</i>	<b>Figure 2 Site Layout Map</b> of the <i>Temporary Emergency Generation Power Plant, Tarbert Power Station, Environmental Report</i> (AECOM, 2023), is shown the site layout plan.
(g) <i>any site layout plans, drawings or other information required to describe the relevant features of the designated development;</i>	<b>Figure 1: Site Location Map</b> <b>Figure 2: Site Layout</b> <b>Figure 3: Designated Development - Detailed Site Layout Plan</b> Submitted with the <i>Temporary Emergency Generation Power Plant, Tarbert Power Station, Environmental Report</i> (AECOM, 2023).
(h) <i>an Appropriate Assessment screening report and, where the applicant considers that an Appropriate Assessment will be required, a Natura Impact Statement;</i>	An Appropriate Assessment (AA) Screening & Natura Impact Statement (NIS) (AECOM, 2023) is submitted with this application.
(i) <i>an Environmental Report;</i>	The <i>Temporary Emergency Generation Power Plant Tarbert Power Station Environmental Report</i> (AECOM, 2023), submitted with this application.
(j) <i>details of the measures, if any, envisaged to avoid or prevent or reduce and, if possible, offset what might otherwise have been significant adverse</i>	The AA Screening & NIS (AECOM, 2023) and <i>Temporary Emergency Generation Power Plant Environmental Report</i> (AECOM, 2023), submitted with this application, provide the measures, to avoid or prevent or reduce any potential significant adverse effects on the environment or adverse effects on the integrity of a European Site of the designated development.

Temporary Emergency Generation Power Plant  
Tarbert Power Station

Requirement	Where / How Addressed
<i>effects on the environment or adverse effects on the integrity of a European Site of the designated development;</i>	A Framework Construction Environmental Management Plan (CEMP) is also included in Appendix B of the <i>Environmental Report</i> .
<i>(k) any other information or document that the applicant considers would be of assistance to the Minister in making a decision in relation to the application.</i>	The following are also submitted with this planning application: <ul style="list-style-type: none"><li>• Appendix B Framework CEMP (of the Environmental Report).</li><li>• Appendix C Framework CTMP (of the Environmental Report).</li><li>• AA Screening &amp; NIS (AECOM, 2023).</li><li>• Letter from CRU to SSE Generation Ireland Limited</li><li>• Letter from EirGrid to SSE Generation Ireland Limited</li></ul>



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SSE Generation Ireland Limited  
Red Oak  
South County Business Park,  
Red Oak South,  
Leopardstown,  
Dublin 18.

21st December 2022

**Re: Application under the Development (Emergency Electricity Generation) Act 2022**

Dear Sir/Madam,

EirGrid notes application due to be made by SSE Generation Ireland Limited to the Minister for the Environment, Climate and Communications under the provisions of the *Development (Emergency Electricity Generation) Act 2022* for Temporary Emergency Electricity Generation Plant at your site at Tarbert, Co. Kerry.

CRU and EirGrid has requested SSE and specifically its site at Tarbert, Co. Kerry to participate in the Temporary Emergency Generation measures. EirGrid is satisfied that this development is required by reason of an emergency, being a temporary electricity emergency identified by the Commission for Regulation of Utilities.

EirGrid's All-Island Generation Capacity Statement (GCS), published in September 2021, set out a generation capacity shortfall in the short and medium term. This potential capacity shortfall arises in periods of peak demand coinciding with low renewable and interconnector availability, and it arises largely due to non-delivery of previously contracted capacity, increasing electricity demand and the increasing unreliability of existing plants. This is a critical point. The State needs to react to an unprecedented situation it has been presented with. This is an electricity emergency and the state's emergency powers are being used to address it.

The Commission for Regulation of Utilities (CRU) has statutory responsibility to monitor and take measures necessary to ensure the security of electricity supply. The CRU has published an Information note in this regard, titled *Security of Electricity Supply – Programme of Actions*. The report summarised EirGrid's assessment of an electricity supply deficit over the next several winters. In addition, it outlined

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**DIRECTORS:** Brendan Tuohy *Chair*

Dr Theresa Donaldson *Deputy Chair* • Mark Foley *Chief Executive*

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key elements of the programme of actions being undertaken by the CRU, in line with its statutory duties, in cooperation with EirGrid, the Department of Environment, Climate and Communications (DECC), the energy industry and other stakeholders, to provide additional stability and resilience to the Irish energy system.

CRU is assisted in this role by EirGrid, Ireland's electricity transmission system operator (TSO). On 7 June 2022, the CRU directed EirGrid to procure, using the most expeditious means available, approximately 450 MW of additional generation capacity from winter 2023-24 to winter 2025-26 to ensure a secure electricity supply. This temporary generation capacity will be in place until more enduring capacity can be delivered through regular market auctions. This procurement process was provided for in other legislation passed through the Oireachtas in the summer of 2022, in the form of the *EirGrid, Electricity and Turf (Amendment) Act 2022*. EirGrid commenced the process on foot of this legislation passing. This 450 MW of additional generation capacity, comprising two emergency generation projects can be delivered by winter 2023-24.

These two temporary emergency generation projects, one of which relates to SSE and its lands at Tarbert, Co. Kerry, will facilitate security of supply and will ensure there is sufficient capacity on the system to enable security of supply in the peak periods when there is low wind and low interconnection available, it is important to note that this will not impede any of Ireland's plans for renewables, interconnection, batteries, demand-side response or energy efficiency. This temporary emergency generation does not replace or displace Ireland's long-term ambitions for renewable energy, which will continue at pace.

This capacity will remain available until the necessary replacement capacity has been secured. The process is linked to the provisions of the *EirGrid, Electricity and Turf (Amendment) Act 2022*, which indicates that these projects must cease operation in 2027, with an option of a further year if required by order of the Minister. The temporary generation will be used only when needed and will be used as a backup in addition to generation capacity in the electricity market.

If the proposed emergency generation project does not proceed, it is possible that power outages could occur due to the forecasted system demand and shortfall forecasted system generation identified in the EirGrid Generation Capacity Statement. This would have a significant adverse effect in terms of energy requirements and supply at home, at work, for commercial developments and industry.

We trust that this is in order.

**Yours sincerely**

DocuSigned by:  
A handwritten signature in black ink that reads "Michael Mahon".

370E39F11D8E4A4...  
**Michael Mahon**

**Chief Infrastructure Officer**



An Coimisiún  
um Rialáil Fóntais  
Commission for  
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SSE Generation Ireland Limited  
Red Oak  
South County Business Park,  
Red Oak South,  
Leopardstown,  
Dublin 18

25<sup>th</sup> January 2023

Our Ref: D/23/1831

## Re: Application under the Development (Emergency Electricity Generation) Act 2022

Dear Madam/Sir,

Under Section 9 of the Electricity Regulation Act, the CRU has a statutory duty to have regard to ensuring security of supply and ensuring that all reasonable demands for electricity are met. Regulation 28 of SI 60 of 2005 puts additional obligations on the CRU and the Transmission System Operator, EirGrid, to ensure security of supply. EirGrid's role includes monitoring and reporting on security of supply, including through the Generation Capacity Statement, and making recommendations to the CRU on measures necessary to cover peak demand and address any shortfalls in capacity.

The Commission for Regulation of Utilities (CRU) published an Information Paper<sup>1</sup> in September 2021. This paper indicated that a projected shortfall in generation capacity to meet future demand had been identified by EirGrid affecting winter periods from 2021/22 to 2025/26, and set out details of a programme of work to address said shortfall. The work is being undertaken in cooperation with EirGrid, the Department of Environment, Climate and Communications (DECC), the energy industry and other stakeholders.

Given the identification of a likely and substantial risk of a security of supply emergency, under the programme and following consent from the Minister for the Environment, Climate and Communications, a direction was issued by the CRU in June 2022 for EirGrid to procure 450 MW of temporary emergency generation capacity using the most expeditious means available. The procurement process was provided for by the EirGrid, Electricity and Turf (Amendment) Act 2022.

One of the two temporary emergency generation projects selected by EirGrid with the approval of the CRU involves SSE and its lands at Tarbert, Co. Kerry. An application is due to be made by SSE Generation Ireland Limited to the Minister for the Environment, Climate and Communications under the provisions of the Development (Emergency Electricity Generation) Act 2022. As set out in the EirGrid, Electricity and Turf (Amendment) Act 2022, the electricity generation plant shall be dispatched only in the circumstances and the manner set out in the risk preparedness plan and in accordance with Article 16(2) of the Risk Preparedness Regulation<sup>2</sup>. The EirGrid, Electricity and Turf (Amendment) Act 2022 also indicates that the generation is expected to cease operation no later than 31<sup>st</sup> March 2027.



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In the event that the proposed emergency generation project does not proceed, the risk of power outages affecting domestic, commercial and industrial customers would be significantly increased during the coming years.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'J. Gannon'.

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**Jim Gannon**  
Commissioner

