15.0 RESOURCE AND WASTE MANAGEMENT

15.1 Introduction

This Chapter has been prepared by Sustech. This chapter describes the anticipated types and quantities of wastes that will be generated and also outlines the waste management policies, practices and programmes that will be employed at the proposed development. This chapter should be read in conjunction with Chapter 2 – Description of the Proposed Development, Chapter 11 – Soils, Geology and Hydrogeology and Chapter 8 – Water Quality and Aqueous Emissions of this EIAR.

This chapter deals predominantly with solid wastes generated during the Construction and Operational Phases of the proposed development. Liquid wastes discharged via the process effluent system are considered fully in Chapter 8.

15.2 Study Methodology

A review of the operational wastes types generated by the existing facility was undertaken. As the proposed development is an expansion of the existing production methods utilised onsite, this data was used to assess waste types that will be generated from the Construction and Operation Phases of the proposed development.

The assessment of the impacts of the proposed development arising from the generation of waste materials was conducted having regard to the following relevant documents:

- EPA Guidelines[1,2]
- National Policies and Strategies such as:
    - SRWMP (2015) Southern Region Waste Management Plan 2015-2021;
    - National Waste Management Plan for a Circular Economy 2024-2030;
    - DOECC (2020) Waste Action Plan for a Circular Economy;
    - EPA (2021) National Hazardous Waste Management Plan 2021-2027; and
    - EPA (2021) The Circular Economy Programme 2021-2027
- Relevant legislation including:
    - Waste Management Act 1996 (as amended);
    - Environmental Protection Agency Act 1992 (as amended);
    - Circular Economy and Miscellaneous Provisions Act 2022 (as amended);
    - European Communities (Waste Directive) Regulations 2011 (as amended);
    - Local Government Act 1994 (as amended) and regulations;
    - Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE);
    - Protection of the Environment Act 2003 (as amended);
    - Litter Pollution Act 1997 (No. 13 of 1997);
    - Industrial Emissions Directive and relevant BAT;

[1] EPA (2022) *Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)*
[2] EPA (September 2015) *Advice Notes for Preparing Environmental Impact Statements – DRAFT*

- Environmental Protection Agency National Waste Database Reports;
- DoEHLG (2006) Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects;
- CIF (2002) Construction and Demolition Waste Management – a handbook for Contractors and Site Managers; and
- EPA (2021) Best Practice Guidelines For The Preparation Of Resource & Waste Management Plans For Construction & Demolition Projects

15.3 Receiving Environment

In terms of waste management, the receiving environment of Cork is part of the Southern Region Waste Management Region which comprises the administrative areas Clare, Limerick, Tipperary, Kilkenny, Carlow, Wexford, Kerry, Cork and Waterford.

The National Management Plan for a Circular Economy 2024-2030 supersedes the Southern Region Waste Management Plan. The policy responses and actions identified build on the previous vision, strategy and progress made under the 2015-2021 Regional Waste Management Plans (RWMP) and provide a flexible policy framework to:

- Promote sustainable consumption patterns and prevent waste;
- Strengthen national waste collection and treatment capacity;
- Support producers, enterprises and facilities enabling transition to the circular economy; and
- Deliver measures through collaboration and shared ownership.

The policy promotes prevention, minimisation, re-use and recycling of waste in accordance with the waste hierarchy and in association with industries, businesses, other statutory and non-statutory Agencies.

15.3.1 Current Waste Management Practices

Both at a global level (Schwabe Group) and at a local site level, a high priority is placed on sustainable waste management practices which minimise the overall environmental impact of the site.

A hierarchy of waste management favouring elimination of wastes over minimisation and disposal is practiced onsite. It is noted that due to the nature of the processes onsite, there is a relatively small amount of waste generated onsite.

The site is currently licensed by the Environmental Protection Agency under Industrial Emissions Licence Register No. P0017-02. There are a number of conditions within the existing IEL that mandate the control and monitoring of waste generated onsite.

All waste is removed from site via an appropriately permitted contractor to an appropriate permitted facility.

Table 15-1 summarises the waste quantities generated onsite during 2024.

Table 15-1 Cara Partners waste production in 2024.

LoW Code	Description	Tonnes in 2024
	Non-Hazardous Waste	
07 05 14	Wastes from the MFSU of pharmaceuticals - solid wastes other than those mentioned in 07 05 13 (leaves, twigs, leaf lipids, leaf extracts and wood dust)	4,987.34
07 05 12	Wastes from the MFSU of pharmaceuticals - sludges from on-site effluent treatment other than those mentioned in 07 05 11	362.72
20 03 07 B	Municipal waste – bulky waste non-household	112.7
15 01 02	Waste packaging – plastic packaging	20.31
17 04 05	C&D waste – iron and steel	17.46
20 01 01	Municipal waste – paper and cardboard	2.71
07 05 99	Wastes from the MFSU of pharmaceuticals – wastes not otherwise specified	1.62
15 01 07	Waste packaging – glass packaging	1.4
15 01 06	Waste packaging – mixed packaging	0.97
	NON-HAZARDOUS SUBTOTAL	*5,507.26*
	Hazardous Waste	
07 05 04*	Wastes from the MFSU of pharmaceuticals - other organic solvents, washing liquids and mother liquors	1,110.13
07 05 01*	Wastes from the MFSU of pharmaceuticals - aqueous washing liquids and mother liquors	667.03
07 05 10*	Wastes from the MFSU of pharmaceuticals - other filter cakes and spent absorbents	48.69
15 01 10*	Waste packaging – plastic packaging	10
20 01 35* B	Municipal waste TVs and monitors, cathode ray tubes	1.4
16 05 08*	Discarded organic chemicals consisting of or containing hazardous substances	1.12
16 05 07*	Discarded inorganic chemicals consisting of or containing hazardous substances	0.07
20 01 21*	Fluorescent tubes and other mercury-containing waste	0.05
	HAZARDOUS SUBTOTAL	*1,838.49*
	TOTAL WASTE	**7,345.75**

In 2024, 99.97% of non-hazardous waste was recycled/reclaimed. The vast bulk of which (4,987.4 tonnes) related to the composting of spent leaf material.

In 2024, 58.99% of hazardous waste was recycled/reclaimed or used for energy generation.

The total waste recycling rate in 2024 is 89.71%.

15.3.1.1 Non-Hazardous Waste

The site has procedures in place for the management of non-hazardous waste.

All wastes are segregated into the correct bins and are free of any hazardous contamination. Hazardous wastes must not be mixed with non-hazardous waste.

Canteen waste is separated using a waste segregation system. Food waste must not be mixed with other waste. Compostable items are placed in the food waste.

Oil waste is emptied into special bins provided by the supplier and returned for recycling.

All waste collected from the site undergoes further segregation at the waste collector's facility.

There are dedicated waste storage areas for waste segregation into appropriate bins prior to collection. There are Standard Operating Procedures governing the waste segregation process as well as ensuring appropriate record-keeping and oversight by management.

15.3.1.2 Hazardous Waste

The site has procedures in place for the management of hazardous waste.

It is a site requirement that every container of hazardous material/waste, even if only in temporary use, must be properly labelled with the relevant hazard label before presenting waste for disposal.

All hazardous waste is stored in accordance with its hazard classification.

Hazardous waste containers are kept closed/covered at all times to prevent evaporation. Hazardous waste materials are segregated in accordance with chemical risk assessments.

Flammable solvents must be stored in designated flame-proof cabinets or in appropriate larger, designated vessels.

The correct PPE is used when handling hazardous wastes in accordance with site SOPs.

All hazardous wastes are transferred, handled, transported and stored in accordance with relevant site SOPs.

All hazardous waste storage areas are periodically inspected and checked.

A detailed record keeping system is in place for hazardous waste management.

15.4 Characteristics of the Proposed Development

15.4.1 General Characteristics

The general characteristics of the proposed development are detailed Chapter 2.

15.4.2 Specific Characteristics

As the proposed development exceeds the Tier 1 thresholds stipulated in the relevant EPA Guidelines[3], a project Resource & Waste Management Plan has been prepared and is attached in Appendix 15-A.

Key design approaches with respect to resource management and waste generation in the construction phase were considered in the proposed design and included:

- Prevention, reuse and recycling;
- Principles of green procurement;
- Opportunities for off-site construction (where possible);
- Material optimisation; and
- Flexibility and deconstruction.

At the project's inception and throughout feasibility assessment, the Applicant evaluated a number of specific key design considerations including:

- Identifying potential reusable site assets, such as buildings, structures, equipment, materials, and soils;
- Assessing existing site buildings for refurbishment/reuse to fulfil project needs, either partially or entirely; and
- Facilitating the maximal recovery of on-site assets.

15.4.2.1 Construction Phase

A detailed overview of the Construction Phase is outlined in Chapter 2.

Excavation works will result in the generation of approximately 6,672 tonnes of excavated material. The design intention is that material excavated during the site clearance and preparatory works will be beneficially reused onsite where practicable in line with relevant legislation and guidance. If not, excess spoil material will be transported offsite by a licensed waste contractor to a suitably permitted facility.

The Construction Phase will typically result in the generation of a range of waste materials such as excavated material, rubble, cladding, steel insulation materials, timber, plastics, cardboard

[3] EPA (2021) *Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects*

packaging, and small quantities of hazardous waste (e.g. resins, oils, adhesives and paint containers).

Project-specific resource and waste management targets for the site have not yet been established. Based on projects of a similar nature, it is anticipated that a minimum of 70% of construction and demolition waste will be reused, recycled, or recovered.

Construction workers will generate various types of waste, including organic/food waste, dry mixed recyclables (such as waste paper, plastic bottles, aluminium cans), mixed non-recyclables, and possibly sewage sludge from temporary welfare facilities. Additionally, waste printer/toner cartridges, waste electrical and electronic equipment (WEEE), and waste batteries may be generated occasionally from site offices.

The RWMP will be implemented for the proposed development in accordance with the applicable guidelines. The RWMP will be part of the overall Construction Environmental Management Plan, which will be put in place by the Contractor for the entirety of the construction activities. The plan includes specific detail on waste segregation and disposal. This document will be subject to revision throughout the course of the Construction Phase. The plan includes specific details on the projected waste types and subsequent management, as described in Table 15-2.

It is noted that there may be opportunities to declare some materials as generated from the construction phase as by-products (e.g. clean soil and stone etc.). Where applicable, relevant guidance[4] will be followed in such instances.

[4] EPA (2019) *Guidance on Soil and Stone By-Products*

Table 15-2: Anticipated waste types generated during the construction phase of the proposed development.

EWC Code	Waste Name	Description
Non-Hazardous		
17 01 01	Concrete (and concrete masonry)	Most concrete generated is expected to be clean, inert material and it is proposed to reuse or recycle it for construction purposes where possible.
17 01 02	Brick	Most brick generated is expected to be clean, inert material and it is proposed to reuse or recycle it for construction purposes where possible.
17 01 03	Tiles and ceramics	Most tile and ceramic material generated is expected to be clean, inert material and it is proposed to reuse or recycle it for construction purposes where possible.
17 01 07	Mixture of concrete, bricks tiles & ceramics	Most of this material generated is expected to be clean, inert material and it is proposed to reuse or recycle it for construction purposes where possible.
17 02 01	Timber	It is expected there will be timber waste generated from material off-cuts, used cable drums, damaged pieces and wooden pallets and crates used for deliveries to site. Timber that is uncontaminated, i.e. free from paints, preservatives, glues etc., will be segregated at source and stored in dedicated skips for recycling.
17 02 02	Glass	A designated skip will be provided for any broken or other waste glass, which can then be recycled. The nominated Waste Manager will liaise with the appointed waste contractor(s) to establish any specific segregation requirements for waste glass (e.g. by colour or type).
17 02 03	Plastic	Plastic generated will be primarily from packaging and material off-cuts. All recyclable plastic will be segregated at source and stored in dedicated recycling skip.
17 04 XX	Metals (including their alloys)	Metals will be segregated into mixed ferrous, cladding, aluminium, high grade stainless steel, low grade stainless steel etc. Metals will be segregated at source and stored in dedicated skips.
17 05 04	Soil and stones other than those mentioned in 17 05 03	If there is any excess inert soils and subsoils excavated that is not required for beneficial reuse as fill onsite it will be reused offsite. The soil will be removed and disposed of by a licensed waste contractor.
17 06 04	Insulation materials, e.g. piping and ducting, insulation panels, etc.	Insulation materials will be separated and placed in designated covered recycling skip on site to prevent it getting wet.
20 01 01	Cardboard	Excess cardboard will be generated from shipping containers, boxes, packing material etc. Cardboard will be flattened and placed in designated covered recycling skip on site to prevent it getting wet.
20 01 35 08 03 17	Waste Electrical and Electronic Equipment (WEEE)	This will consist of electrical equipment out of date or damaged. A receptacle will be available for WEEE.
Hazardous		
13 01 XX*	Hydraulic oils	Liquid waste will be stored in drums in a designated bunded area of the construction compound. When the level of the tank reaches a predetermined level, the waste contractor will be notified, prepare the necessary paperwork and obtain the required approvals before transporting the waste liquid off site
13 02 XX*	Engine, gear and lubricating oils	

EWC Code	Waste Name	Description
13 07 XX*	Liquid fuels	
13 08 XX*	Oil wastes not otherwise specified	
15 02 XX*	Absorbents, filter materials, wiping cloths and protective clothing	All disposable PPE or any material will be segregated from non-hazardous waste and disposed of in designated waste receptacles. All wipes and cloths used in the event of spills onsite will be treated as hazardous waste and will be managed accordingly.
17 01 06*	Mixtures of, or separate fractions of concrete, bricks, tiles and ceramics containing hazardous substances	Should this material be encountered, it will be appropriately segregated and stored prior to offsite removal by an appropriately licensed waste contractor.
17 03 01*	Bituminous mixtures containing coal tar	Waste materials arising from excavation in roads often include the road surface itself, contain hazardous materials such as asphalt, tar, or other contaminants.
17 05 03*	Soil and stones containing hazardous substance	Should this material be encountered, it will be appropriately segregated and stored prior to offsite removal by an appropriately licensed waste contractor.
17 06 01* 17 06 03* 17 06 05*	Insulation and construction materials (containing asbestos or other hazardous substances)	These will be transferred to a specialised container in the waste storage area and taken offsite by a licenced waste contractor.
20 01 27-28*	Paints, inks, adhesives, resins	These will be transferred to a specialised container in the waste storage area and taken offsite by a licenced waste contractor.

15.4.3 Operational Phase

Based on the experiences of the existing facility, it is anticipated that the proposed expanded development will continue to generate similar types of solid wastes during the Operational Phase of the facility.

Typical wastes that will be generated in the Operational Phase are as per those listed in Table 15-1. It is anticipated that the Operational Phase waste types will increase to c. 150% of current values on a *pro rata* basis at completion of the proposed development e.g. c. 11,019 tonnes/year.

It is a key pillar of Cara's approach to waste management to prevent pollution by reducing waste at source, recycling materials for reuse where possible, recovering where possible and ensuring the safe disposal of remaining waste.

A comprehensive waste management strategy will be developed for the proposed development and incorporated into existing practices and procedures.

All waste management activities will comply with BAT requirements and the current IEL requirements.

As part of the site EMS, Cara has a number of relevant SOPs which provide for the appropriate management of waste. These will be revised and updated as necessary to account for the construction of the proposed development prior to operation.

Where necessary, site procedures and processes will be updated to account for the proposed development.

For both hazardous and non-hazardous wastes, only waste contractors holding a valid and current local authority permit to collect the specified wastes will be allowed to collect waste and the permit will only be accepted as valid if the final disposal destination for the wastes is also permitted and licenced.

The continual implementation of a waste minimisation scheme should lead to lesser amounts of solid waste streams from this source over time.

15.5 Potential Impact of the Proposed Development

The potential impacts of the development in terms of waste generation and waste management are detailed in this section.

15.5.1 Construction Phase

The potential impacts of the proposed development, in relation to construction waste are that, should a Resource and Waste Management Plan not be implemented, targets and objectives outlined in the relevant national and regional waste management policies would not be achieved.

The use of unlicensed waste contractors could give rise to inappropriate management of waste and result in environmental impacts and/or pollution.

In addition, if waste is not managed and stored correctly onsite, this may lead to litter or pollution issues on the site, adjacent sites or in the surrounding area.

If the Resource and Waste Management Plan is implemented and a high level of due diligence is carried out at the site, it is envisaged that the environmental impact of the Construction Phase of the development will be short term and imperceptible.

15.5.2 Operational Phase

As with the construction and demolition waste, the potential impacts of the development are that, should a Waste Management Strategy not be developed for the proposed development, then targets and objectives outlined in the relevant national and regional waste management policies would not be achieved.

Similarly, the use of unlicensed waste contractors could give rise to inappropriate management of waste and result in environmental impacts and/or pollution.

In addition, if waste is not managed and stored correctly on site, this may lead to litter or pollution issues on the site, adjacent sites or in the surrounding area.

Compliance with the IEL and adherence to the waste hierarchy for the proposed development will ensure that a high level of recycling, recovery and reuse is achieved at the site, thereby minimising the potential impacts of the development.

15.6 Do Nothing Scenario

The existing facility would continue to produce the current level of waste generated onsite.

15.7 Mitigation Measures

15.7.1 Construction Phase

The RWMP will continue to be developed, implemented and reviewed regularly by the Contractor. This RWMP will include all the relevant information required and provides procedures for each waste that will be produced at this stage of the development.

All C&D waste will be segregated onsite, and the materials will be stored in a specifically designated area of the site. Waste contractors that have recovery facilities for different materials, will be sourced to achieve a high level of recovery and recycling. All waste taken from the site will only be removed by a waste contractor permitted. All waste that is collected from the site will be only taken to a site permitted by a Local Authority or licensed by the EPA.

Other typical measures included in such RWMPs include:

- A Resource Manager will be appointed by the construction contractor to oversee and take ownership of the waste programme to ensure compliance with the RWMP.
- All non-hazardous waste materials will be transferred to skips or other suitable receptacles in designated waste storage areas.
- All hazardous waste will be packaged in appropriate receptacles and stored in dedicated hazardous waste storage areas pending transportation offsite.
- All waste storage areas will be audited regularly to ensure the wastes are being segregated and stored in accordance with the RWMP.
- If any potentially contaminated soil is encountered during the construction works, it will be segregated from all other soils, tested to confirm the classification of the soil for disposal purposes and will be collected and disposed of by a permitted waste contractor to a suitably licenced landfill.
- All waste leaving site will be recycled, recovered or reused where possible, with the exception of those waste streams where appropriate facilities are currently not available.
- Quantities of waste leaving the site will be recorded and copies of relevant documentation maintained onsite.

The impacts of the development during the construction and demolition phase will therefore be minimised due to the organised management and recycling of the C&D waste.

15.7.2 Operational Phase

As outlined above, there is a significantly successful practice of waste management at the existing facility. This will be expanded to accommodate the proposed development.

There will be dedicated storage areas for non-hazardous waste which will have separate receptacles for all recyclable materials so that onsite segregation will take place. In addition, general waste receptacles will be available for waste not suitable for recycling.

Hazardous waste will be stored and handled separately and disposed of using fully licensed and permitted contractors.

Other typical measures will include:

- All wastes will be continued to be managed in accordance with IEL requirements and the site EMS. These are subject to periodic audits.
- Ensure that waste is properly packaged and labelled according to the type of waste.
- Ensure that personnel involved in the management of waste are qualified and trained to perform job specific duties.
- Liaise with personnel, contractors and regulators on all waste/certification matters.
- Ensure that waste is properly segregated and the waste being shipped meets the appropriate waste acceptance criteria.
- Ensure that waste is disposed of in a manner compliant with all regulations and standards of practice.
- Ensure that copies of licenses for all approved disposal locations used by the waste contractor are on file as per the EMS.
- The waste contractor may be subject to audits by Cara personnel to verify compliance with regulations and standards.

The impacts of the proposed development, in terms of waste disposal to landfill during operation, will therefore be minimised by the waste management strategy for the proposed development.

15.8 Predicted Impact of the Proposed Development

15.8.1 Construction Phase

There will be permanent stripping of topsoil, subsoil and excavation of rock. The segregation of construction materials at source will ensure that optimum recycling, reuse and recovery of waste materials will be achieved. Therefore, during the Construction Phase, provided the mitigation measures are implemented, the predicted impact will be neutral and long-term.

15.8.2 Operational Phase

All solid waste generated onsite will be subject to the site waste management strategy which includes source segregation and policies of reduce, reuse and recycle.

As long as practices onsite comply with the waste management strategy then the predicted impact will be long-term and imperceptible.

15.9 Monitoring

Waste materials leaving the site will be recorded and copies of appropriate permits will be kept onsite. All monitoring will be performed in accordance with IEL and EMS requirements.

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Appendix 15-A

DJF (2026) *Outline Resource & Waste Management Plan* (Ref. 5340-PA-DJF-PL-0005)

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CLIENT:

CARA PARTNERS

PROJECT: Production Expansion at the existing facility at Little Island Industrial Estate, Wallingstown, Little Island, Co. Cork.

DOCUMENT TITLE: Outline Resource & Waste Management Plan

DJF Engineering Services Ltd.
Tramore House, Reeveswood, Douglas Road, Cork, Ireland
Tel: 021-2392424• Email: info@djfes.com•Web: www.djfes.com

Current Issue	Date	Issue Description	Approvals	
			By	Approved
P01	06/11/2025	Draft Issue	AC	SH
P02	21/01/2026	Planning Issue	AC	SH

CONTENTS

1.0 INTRODUCTION

1.1 Background

DJF Engineering Services have been appointed by Cara Partners to prepare this Resource and Waste Management Plan (RWMP) as part of the Environmental Impact Assessment Report (EIAR) for the proposed production expansion at the existing facility within Little Island Industrial Estate, Wallingstown, Little Island, Co. Cork.

The purpose of this RWMP is to identify project activities that may generate waste and to outline procedures for managing such waste in compliance with all relevant legislative and contractual requirements. The plan is designed to promote the prevention, reduction, reuse, and recycling of materials throughout the construction and demolition phases of the project.

This RWMP includes, but is not limited to, the following key components:

- Clearly defined and achievable waste management objectives;
- An analysis of anticipated waste streams; and
- Proposed methods for waste prevention, reuse, and recycling.

The report also establishes a Waste Management Framework and identifies the main categories of waste likely to arise during construction.

This RWMP should be treated as a **live document**, to be finalised by the appointed Contractor prior to the commencement of site works. The Contractor will be responsible for maintaining, updating, and fully implementing this plan. In coordination with the Construction/Resource Manager, the Contractor must ensure that all measures outlined herein are effectively executed.

The **Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction and Demolition Projects** (EPA, 2021) define the recommended structure and content for Tier 1 and Tier 2 RWMPs. This plan will be updated throughout the construction period to reflect monitoring results, legislative changes, and feedback from third-party consultations. Additional appendices may be incorporated as necessary to include monitoring data, permits, and other relevant documentation.

The RWMP also defines points of contact for each waste type generated during the project and references the corresponding written procedures for their management.

An **Environmental Impact Assessment Report (EIAR)** and an **Appropriate Assessment & Natura Impact Statement (AA screening & NIS)** have been prepared to assess the potential environmental impacts of the proposed project. The mitigation measures related to resource use and waste management, as identified in the EIAR and AA NIS, are addressed within this RWMP, and this document should be read in conjunction with those reports.

Additionally, a **Construction Environmental Management Plan (CEMP)** has been prepared by DJF Engineering Services for the proposed development. This CEMP should also be reviewed alongside the RWMP.

1.2 Legislation

This document has been prepared in accordance with the requirements and recommendations of the following legislation and guidance documents:

- Waste Framework Directive 2008/98/EC (as amended);
- Landfill Directive 1999/31/EC (as amended);
- Waste Management Act 1996-2011 (as amended);
- Waste Management (Collection Permit) (Amendment) Regulations 2023 (S.I. No 63 of 2023);
- Litter Pollution Act 1997 (No. 12 of 1997) (as amended in March 2022);
- European Communities (Waste Directive) (Amendment) Regulations, 2020;
- EU Construction and Demolition Waste Management Protocol (European Commission updated edition 2024);
- The Department of Communications, Climate Action and Environment (DCCAE) A Waste Action Plan for a Circular Economy, Ireland's National Waste Policy 2020-2025 (DCCAE 2020);
- By-Product Guidance Note, A Guide to by-products and submitting a by-product notification under Article 27 of the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) (EPA, 2020);
- Circular Economy Action Plan, For a Cleaner and More Competitive Europe (European Commission 2020);
- Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction and Demolition Projects (EPA 2021);
- The Southern Region Waste Management Plan 2015-2021;
- Cork County Waste Management By-Laws 2019
- Draft National Waste Management Plan for a Circular economy, 2023;
- The Circular Economy Programme 2021-2027;

- Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less';
- National Hazardous Waste Management Plan 2021 – 2027 (EPA 2021);
- Guidance Document for the Local Authority Sector: Management of Materials Arising from Roadworks, (CCMA 2020).
- Guidance on the Interpretation of Key Provisions of Directive 2008/98/EC on Waste (European Commission, 2018)
- Guidelines for the Waste Audits Before Demolition & Renovation Works of Buildings (European Commission, May 2018)
- Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites (EPA 2013).

2.0 DESCRIPTION OF THE PROJECT

2.1 General

Cara Partners Limited Partnership, acting by its general partner Wallingstown Company Limited, intends to apply for permission for the construction of new multi-storey pharmaceutical building, laboratory together with associated structures, plant, equipment, and piperacks.

The works will include modifications to existing process areas, installation of new process systems, tanks, and supporting infrastructure. The project also provides for site upgrades, including an extension to the existing car park and improvements to utilities and services.

All associated ancillary works, landscaping, and site development works will be carried out at the existing facility at Little Island Industrial Estate, Wallingstown, Little Island, Co. Cork, T45 RK30.

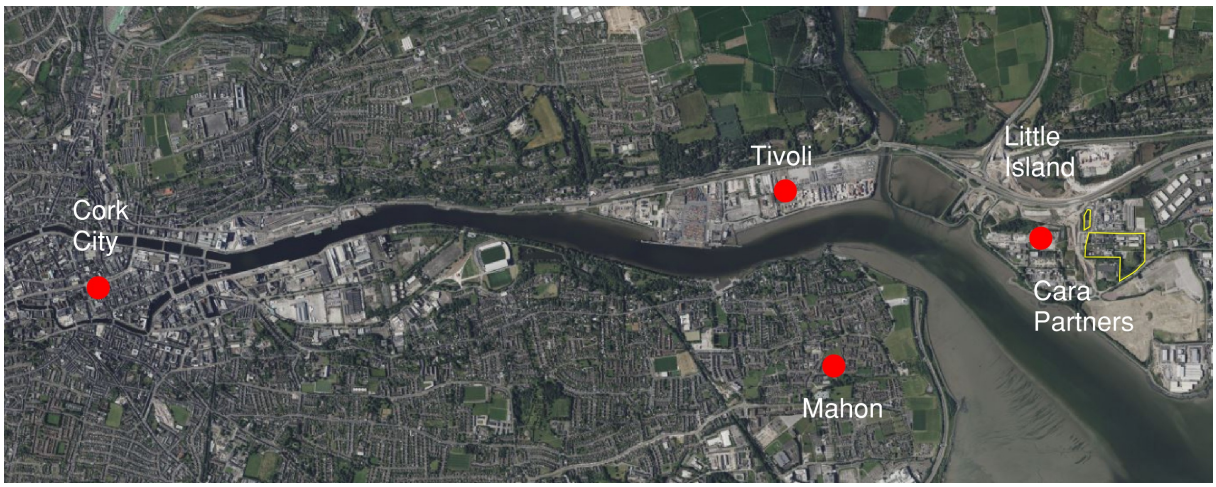

Figure 1. Site location in relation to Little Island and Cork City

The Cara Partners facility is located within the Little Island Industrial Estate, situated on the western side of Little Island, approximately 2.5 km south-east of Glanmire and about 7 km east of Cork City. The River Lee and Lough Mahon lie to the south, separating Little Island from Mahon and Cork City to the west.

The Little Island Industrial Estate accommodates a range of industrial and commercial enterprises, including two pharmaceutical manufacturers—Cara Partners and Viatris—as well as the Little Island AGI Pumping Station, Hydraulic Repair Services, DPD Depot, EHS Fire Training Centre, and Dosco Manufacturing.

Cara Partners operates a pharmaceutical manufacturing facility dedicated to the production of a standardized extract of *Ginkgo Biloba*, an Active Pharmaceutical Ingredient (API) produced at commercial scale. The company has been manufacturing this extract in Cork since 1978.

The site is accessed via the R623 to the south and comprises several industrial buildings. The N25 national primary route, which connects Cork and Waterford, runs to the north of Little Island and separates it from Glanmire.

Figure 2. Site location (In Yellow)

2.2 The proposed development:

The proposed development includes the following:

Unit 1 Production Building - Construction of a replacement, multi-storey Unit 1 Production building, approx. 34m L x 23m W x 26m H (approx. 3,000m^2) and ancillary plant and services related to same including piperacks

In Process Tank Farm Bund Modifications to the existing 'In Process Tank Farm' bund and ancillary plant and services related to same including piperacks

Laboratory Gas Bottle Store - Construction of a new Laboratory Gas Bottle Store approx. 4m L x 2m W x 4m H and ancillary plant and services related to same including piperacks

Regenerative Thermal Oxidiser - Provision of a new Regenerative Thermal Oxidiser, associated exhaust stack approx. (10mAGL) and ancillary plant and services related to same including piperacks

Process Cooling - Provision of 1no. process cooling tower (approx. 5mAGL) and ancillary plant and services related to same including pipe racks

Combined Heat & Power Plant (CHP) - Provision of a new CHP, associated exhaust stack approx. (13mAGL) and ancillary plant and services related to same including pipe racks.

Ethanol Storage Tank - addition of a new ethanol storage tank (2.4m diameter x 7m high) in existing solvent tank farm bund and ancillary plant and services related to same including piperacks

Car Park – extension to existing car park including associated lighting to provide a net increase of additional 67 no. permanent car parking spaces.

WWTP Control and Blower Building – Single storey building associated with WWTP expansion, approx. 11m L x 10m W x 4m H (approx. 90m^2); and ancillary plant and services related to same including pipe racks

WWTP Chemical storage tanks and bund – new concrete base and bund (approx. 45m^2) with tanks approx. 3.5m AGL and ancillary plant and services related to same including pipe racks

WWTP Inlet works – new screens, tanks up to approx. 9m above ground Level and ancillary plant and services related to same including pipe racks

WWTP Dissolved Air Flotation tank – new tank approx. 5m L x 2m W x 4m H and ancillary plant and services related to same including pipe racks.

Site Works – All associated site services, site development works and landscaping to facilitate the proposed development.

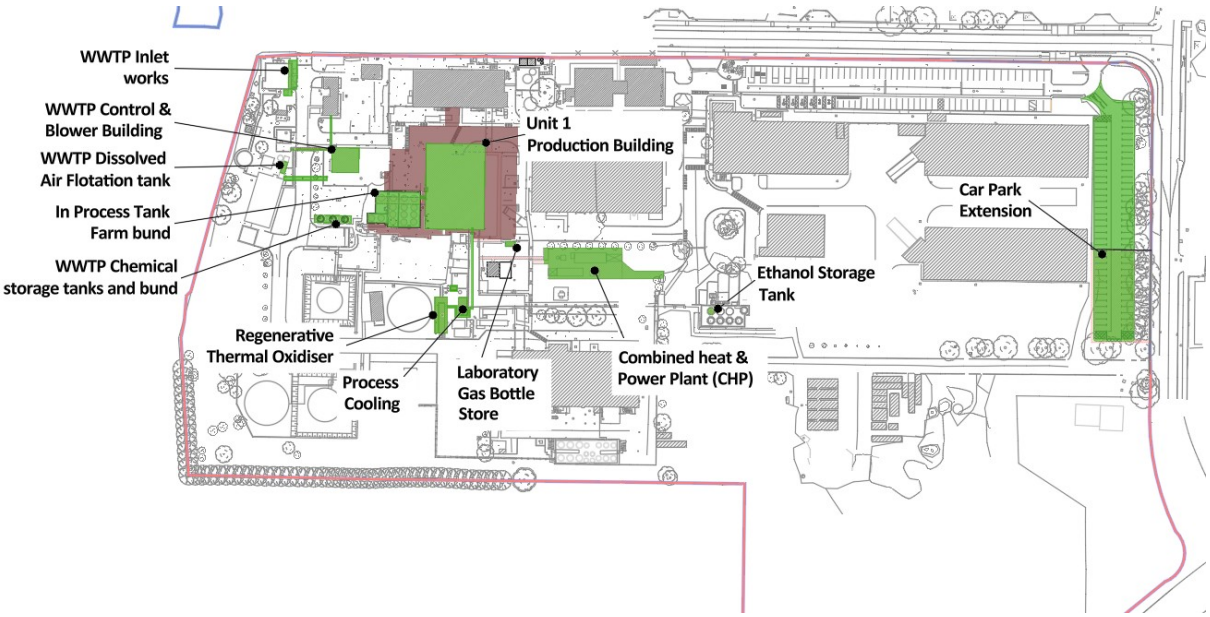

Figure 3. Proposed developments

2.3 Phasing, Construction Programme and Milestones

The proposed works will be phased. The table below reflects the envisaged phasing of construction for each of the major elements of the proposed development:

Phase	Start
Unit 1 Site set up & enabling works	Q3 2026
Unit 1 Production Building Construction	Q3 2026
External Plant & Equipment including In Process Tank Farm, Laboratory Gas Bottle Store, Regenerative Thermal Oxidiser, Process Cooling, & other external plant & equipment associated with Unit 1, CHP and other external plant & equipment	Q2 2027
Car Park Upgrade	Q2 2028
WWTP Upgrade including WWTP building construction	Q1 2032

Given the nature of the proposed development, it is noted that various elements within a given construction phase may not be completed before the next phase of construction commences.

2.4 Hours of Operation,

Construction operations will generally be restricted to between 08:00am hours and 08:00pm hours Monday to Friday and 08:00am hours and 06:00pm hours on Saturdays, with no Sunday operations.

- Mon-Fri – 08.00am – 08.00pm
- Saturday – 08.00am – 06.00pm

- Sunday & Bank Holidays – No Working

Any works outside the stated hours of operation will be agreed with the local authority in advance.

2.5 Parties to the Project

Key parties to the project are listed below:

Role	Company
Client	Cara Partners
Civil/Structural/Architectural Consultants	DJF Engineering Services
Process, Mechanical, Electrical & Instrumentation	Prochem
PSDP	Prochem
Environmental	Sustech
Wastewater Treatment	WeW
Contractors	Various to be appointed

3.0 ROLES AND RESPONSIBILITIES

3.1 General

In line with the *EPA (2021) Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects*, a Resource Manager will be appointed to oversee waste and resource management. The Resource Manager will be a competent, trained member of the project team with authority to ensure compliance with RWMP objectives.

The RWMP will be implemented through the coordinated efforts of the Client, Design Team, Contractor, and Resource Manager, as outlined below:

3.2 Client

The Client (Original Waste Producer) holds overall responsibility for preparing, submitting, and implementing the RWMP.

Responsibilities:

- Commission and approve the pre-construction RWMP;
- Agree the RWMP with the Local Authority before works commence;
- Appoint a competent Contractor to deliver RWMP compliance;
- Review the final RWMP at project completion;
- Ensure performance targets for waste and resource management are achieved.

  It should be noted that the day-to-day implementation & compliance is the responsibility of the appointed contractor & PSCS see **3.4**

3.3 Design (Client Advisory) Team

The Design Team supports the Client in embedding sustainable waste and resource management principles into the project.

Responsibilities:

- Prepare and maintain the RWMP through design, planning, and procurement;
- Nominate a Resource Manager;
- Include projected waste quantities and types in design documentation;
- Incorporate planning conditions related to waste;

- Manage demolition scope and valuations;
- Handover the RWMP to the Contractor at construction start;
- Collaborate to meet waste minimisation and recovery targets.

3.4 Contractor

The Contractor (Waste Holder) is responsible for implementing and maintaining the RWMP during construction.

Responsibilities:

- Review and update the RWMP per *EPA (2021)*;
- Appoint a qualified Resource Manager;
- Ensure subcontractor and supplier compliance;
- Verify hauliers' Waste Collection Permits and facility licences;
- Manage on-site waste segregation, reuse, and recycling;
- Keep full waste and resource records;
- Submit End-of-Waste or By-Product notifications to the EPA, if required;
- Provide training/toolbox talks;
- Prepare an End-of-Project RWMP Review Report.

3.5 Resource Manager

The Resource Manager oversees implementation and monitoring of the RWMP.

Key duties:

- Conduct waste audits and checks;
- Implement reuse and recycling practices;
- Maintain the waste register and tracking systems;
- Liaise with the Client, Contractor, and Design Team;
- Report on audits and performance;
- Deliver training and toolbox talks.

3.6 Communication and Reporting

Effective communication ensures transparency and compliance.

The RM and Contractor will:

- Report waste and resource data to the Client and project team;
- Engage with the Local Authority during inspections and address corrective actions;
- Liaise with relevant stakeholders (EPA, public, etc.);
- Prepare a Final RWMP Report detailing reuse, recovery, and final waste destinations for submission to the Client and Local Authority.

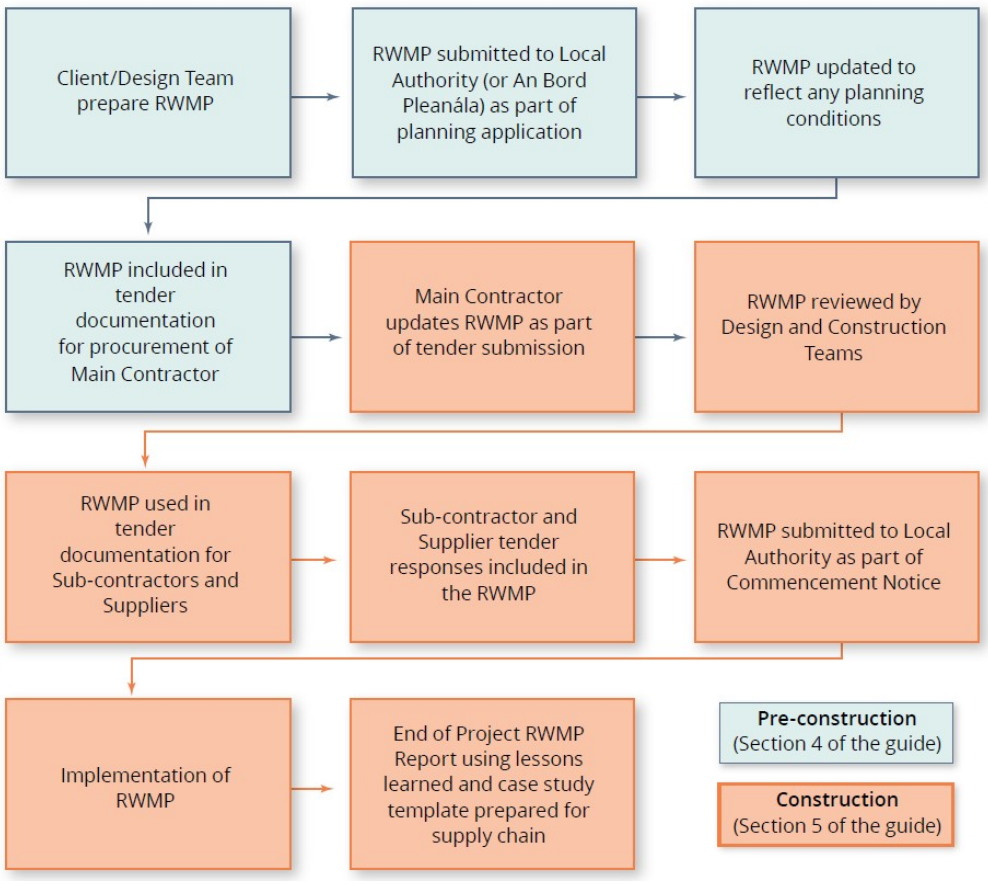

Figure 4. Project life cycle of the RWMP (EPA 2021)

4.0 DESIGN APPROACH

4.1 Waste management Principals

Management of all waste throughout the project lifecycle will be conducted in accordance with EU, national, and regional waste management policies, following the principles of the Waste Hierarchy—prevention, minimization, reuse, recovery, and recycling. International best practices have been applied during the design phase to prioritize waste prevention, reuse, recycling, and material recovery wherever possible.

To support this approach, the client and design team have incorporated the *Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects* into the design workshops. These guidelines have been used to review processes, identify and evaluate resource reduction measures, and assess their impact on cost, time, quality, buildability, second-life potential, and post-demolition management. Further details on these design principles can be found in the referenced guidance document.

The design process has been undertaken in line with international best practice principles, focusing first on preventing waste, then on reusing materials where feasible, and subsequently on sustainably reducing and recovering materials. Key areas of focus during the design process and material selection include:

- **Prevention**
- **Reuse**
- **Recycling**
- **Green Procurement Principles**
- **Off-Site Construction**
- **Materials Optimisation**
- **Flexibility and Deconstruction**
- **Green Procurement Principles**

The use of prefabricated and precast materials should be implemented wherever possible due to the significant benefits they offer:

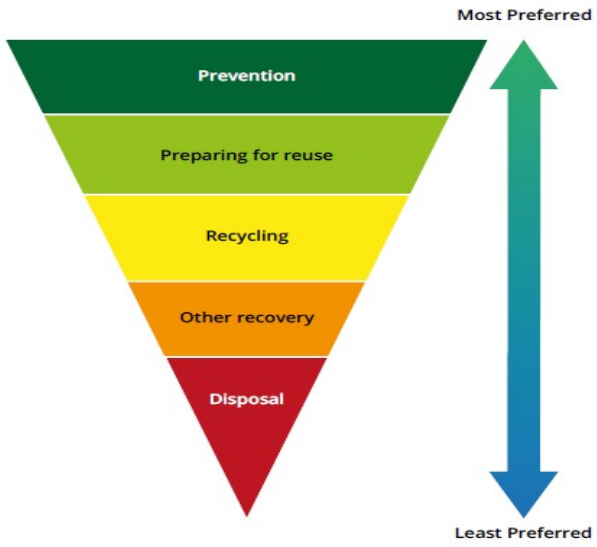

Figure 1-1: Waste Hierarchy (source: EPA)

Figure 5. Accepted best practices Waste Hierarchy (EPA 2018)

4.2 Prevention

The design of this new development has been developed in accordance with the EPA *Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects* (2021) and the principles of the Waste Hierarchy. The design approach focuses on preventing waste generation at source through efficient planning, material optimisation, and responsible procurement.

Key design-stage prevention measures include:

- **Design Efficiency:** Application of Building Information Modelling (BIM) to accurately forecast material requirements, reducing over-ordering and offcuts.
- **Material Optimisation:** Specification of durable, long-life, and modular building components to minimise replacement waste and allow for future adaptability.

- **Sustainable Procurement:** Engagement with suppliers offering reusable or recyclable materials, reduced packaging, and take-back schemes.
- **Construction Planning:** Incorporation of off-site fabrication and just-in-time delivery strategies to minimise on-site material handling and damage.

These integrated measures ensure that waste prevention is embedded throughout the project lifecycle, supporting compliance with EU, national, and regional waste management policies and aligning with international best practice in sustainable construction.

4.3 Green Procurement Principals

Procurement for the scheme will primarily be addressed during the Construction Phase by the appointed contractor. However, from a design perspective, material specifications will remain flexible to allow contractor-proposed variations that incorporate reclaimed materials, reduced packaging, local sourcing, and minimal waste.

Goods and services should be sourced on an "as-needed" basis to reduce packaging and waste. Waste prevention and minimisation methods will be discussed early with staff, subcontractors, and suppliers, with sustainable design solutions agreed upon prior to procurement. Ordering procedures will aim to avoid over-ordering and utilise take-back schemes for surplus materials and off-cuts. Packaging reduction will be explored through collaboration with subcontractors and suppliers, using approaches such as "Just-in-Time" delivery.

Supply chain competency will be assessed prior to appointment through a pre-qualification questionnaire addressing key environmental considerations. The contractor will review proposed new materials to ensure they contain recycled content where feasible, meet performance and regulatory standards, and are available locally at a reasonable cost.

At the pre-procurement stage, the client will engage with contractors and suppliers to discuss:

- Waste prevention and minimisation during construction;
- Sustainable and innovative design solutions;
- Ordering procedures to reduce waste;
- Packaging reduction strategies; and
- Reuse and recycling rate targets.

Green procurement will integrate environmental, cost, and quality considerations. Operational and embodied carbon targets will be set early in collaboration with the design team to prioritise low-carbon material options. A Sustainable Construction Plan will be developed, addressing demolition reduction, material reuse and recycling, and sourcing of green materials such as Responsible Steel. The use of off-site manufacturing will be promoted to reduce residual waste by up to 90% compared with traditional construction (EPA, 2021). Low-carbon additives such as GGBS in concrete will also be considered to lower the project's carbon footprint while maintaining performance standards.

4.4 Off-site Construction

The use of prefabricated and precast materials should be implemented wherever possible due to the significant benefits they offer:

- **Superior quality and accuracy:** Factory fabrication is standardised, reducing the effects of weather and site conditions.
- **Reduced waste and over-ordering:** Materials can be precisely ordered and produced off-site, minimising surplus.
- **Faster construction times:** Precast elements allow rapid establishment of floor levels and quick enclosure of facades, enabling internal works to proceed earlier.
- **Environmental advantages:** Precast fabrication mitigates environmental effects, reduces contamination risks (e.g., from concrete spillages), and limits on-site production waste.

Additionally, key components of a facility's mechanical and electrical (M&E) systems can also be prefabricated off-site, allowing construction and installation to proceed at the same time as the main structure

The design incorporates prefabricated and precast elements, which can be manufactured off-site to the required specifications. These elements may include:

- Structural steel
- Modular pipe racks
- Cable conduits
- Cable trays
- Precast structural components

4.5 Material Optimisation of materials

The project adopts standardised design details, minimising overdesign and reducing unnecessary components. Only conventional materials are specified, with many available from local or regional suppliers.

4.6 Flexible and Deconstructable Design

No unconventional construction materials are required as part of this project. The majority of construction materials used can be recyclable or recoverable and have been designed to allow for easy disassembly.

5.0 KEY MATERIALS AND QUANITIES

Project-specific resource and waste management targets for the site have not yet been established. These targets will be confirmed by the client and the document will be updated accordingly. Based on projects of a similar nature, it is anticipated that a minimum of **70% of construction and demolition waste** will be **reused, recycled, or recovered**.

Once confirmed, these targets will be used to set project-specific benchmarks and to monitor progress throughout the construction phase. Typical **Key Performance Indicators (KPIs)** that may be applied in accordance with relevant guidelines include:

- Weight (tonnes) or volume (m^3) of waste generated per construction value;
- Weight (tonnes) or volume (m^3) of waste generated per construction floor area (m^2);
- Fraction of resources reused on site;
- Fraction of resources classified as by-products;
- Fraction of waste segregated at source prior to off-site recycling or recovery; and
- Fraction of waste recovered, recycled, or disposed.

5.1 Main Construction and Demolition (C&D) waste categories

The principal **non-hazardous and hazardous waste streams** expected to arise during the construction phase are outlined in **the table below**. Each waste stream is assigned a corresponding **List of Waste (LoW) code**, as defined under the **European Waste Catalogue (EWC) (EPA, 2015)**, effective from 1 June 2015.

These categories provide the basis for classification, handling, and traceability of C&D waste generated on site in accordance with the **Waste Management Act 1996 (as amended)** and the **Construction and Demolition Waste Management Plan Guidelines (2006)**.

The Resource Manager will keep records of all resource materials and waste generated, used, and disposed of on-site. This includes materials reused, recycled, backfilled, or disposed of through third parties. A sample recording table is provided in below and will be updated as needed to track movements. All information will be compiled into a database and included in the RWMP during construction.

Waste Type	LoW Code	Description	Volume Generated (Tonnes)	Prevention (tonnes) (non-waste)	Reused (tonnes) (non-waste)	Recycled (tonnes)	Recovered (tonnes)	Disposed (tonnes) (waste)	Unit Cost Rate (€/tonne)	Unit Cost Rate (€/tonne)
Concrete	17 01 01	Concrete (non-hazardous)								
Bricks	17 01 02	Bricks								
Tiles and Ceramics	17 01 03	Tiles and ceramics								
Mixtures of, or separate fractions of concrete, bricks, tiles and ceramics	17 01 06*	Containing hazardous substances								
Mixtures of concrete, bricks, tiles and ceramics other than those	17 01 07	Non-hazardous mixtures of concrete, bricks, tiles and ceramics								

Waste Type	LoW Code	Description	Volume Generated (Tonnes)	Prevention (tonnes) (non-waste)	Reused (tonnes) (non-waste)	Recycled (tonnes)	Recovered (tonnes)	Disposed (tonnes) (waste)	Unit Cost Rate (€/tonne)	Unit Cost Rate (€/tonne)
mentioned in 17 01 06										
Wood	17 02 01	Wood (non-hazardous)								
Glass	17 02 02	Glass (non-hazardous)								
Plastic	17 02 03	Plastic (non-hazardous)								
Bituminous mixtures, coal tar	17 03 01*	Hazardous substances								
Bituminous mixtures containing other than those mentioned in 17 03 01	17 03 02	Non-hazardous								
Copper, Bronze, Brass	17 04 01									

Waste Type	LoW Code	Description	Volume Generated (Tonnes)	Prevention (tonnes) (non-waste)	Reused (tonnes) (non-waste)	Recycled (tonnes)	Recovered (tonnes)	Disposed (tonnes) (waste)	Unit Cost Rate (€/tonne)	Unit Cost Rate (€/tonne)
Aluminium	17 04 02	Aluminium								
Lead	17 04 03	Lead								
Zinc	17 04 04	Zinc								
Iron and steel	17 04 05	Iron and steel								
Tin	17 04 06	Tin								
Mixed Metals	17 04 07	Mixed Metals								
Soil and Stone	17 05 04									
Insulation Material	17 06 04									
Construction Materials Containing Asbestos	17 06 05*	Hazardous substances								
Mixed Construction and Demolition Waste other than those mentioned in 17 09 01, 17 09 02, 17 09 03	17 09 04									

Waste Type	LoW Code	Description	Volume Generated (Tonnes)	Prevention (tonnes) (non-waste)	Reused (tonnes) (non-waste)	Recycled (tonnes)	Recovered (tonnes)	Disposed (tonnes) (waste)	Unit Cost Rate (€/tonne)	Unit Cost Rate (€/tonne)
Paper and Cardboard	20 01 01	Paper and cardboard								
Wood containing hazardous substances	20 01 37*	Hazardous wood waste								
Wood (non-hazardous)	20 01 38	Wood other than that mentioned in 20 01 37								
Mixed Municipal Waste	20 03 01	Mixed municipal waste								
Paints, Inks, Adhesives & Resins (hazardous)	20 01 27*	Containing hazardous substances								

Waste Type	LoW Code	Description	Volume Generated (Tonnes)	Prevention (tonnes) (non-waste)	Reused (tonnes) (non-waste)	Recycled (tonnes)	Recovered (tonnes)	Disposed (tonnes) (waste)	Unit Cost Rate (€/tonne)	Unit Cost Rate (€/tonne)
WEEE	16 02 14	Discarded electrical and electronic equipment (non-hazardous)								
Batteries & Accumulators	16 06 xx	Batteries and accumulators (specific codes as applicable)								
Liquid Fuels	13 07 xx	Liquid fuels such as diesel, petrol or oil residues (hazardous substances)								

6.0 SITE MANAGEMENT

6.1 Resource and waste Management

A dedicated Resource Manager will be appointed by the Contractor for the duration of the Construction Phase to ensure operational efficiency, compliance, and effective on-site waste management. This role holds overall responsibility for supervising, recording, and reporting all waste management activities, promoting waste minimisation, reuse, and recycling in line with legislative and regulatory requirements.

The following initiatives should be considered to assist in this task:

- **Waste Oversight:** Manage the waste team and subcontractors' waste activities. Ensure all waste removed offsite is correctly classified list of Waste / European Waste Catalogue code (LoW/EWC codes), transported, and disposed of in compliance with legislation. Maintain comprehensive on-site records accessible to the Client, Employer's Representative, and statutory consultees (Cork County Council, EPA etc).
- **Material Management:** Order materials on an "as needed" basis and coordinate deliveries with the project schedule to reduce on-site storage. Provide appropriate storage facilities to prevent material damage and environmental impact. Assess and reuse existing materials on-site (e.g., excavation spoil, offcuts) wherever feasible. Specify materials with lower environmental impact or recycled content, meeting functional and regulatory requirements. Standardise design details and materials to reduce bespoke elements and improve efficiency.
- **Coordination:** Liaise with suppliers, service providers, subcontractors, and Cork County Council to prioritise waste prevention, recycling, and reuse, and ensure compliance with best practices.
- **Training & Awareness:** Conduct site induction training covering environmental awareness and waste segregation. Deliver regular toolbox talks to reinforce waste management protocols. Receive training in record-keeping, audits, waste minimisation, segregation, storage, and reuse methods.
- **RWMP Implementation:** Implement and update the Resource and Waste Management Plan (RWMP) to reflect new practices, materials, and suppliers. Conduct regular audits to monitor compliance, identify non-compliance, and implement corrective actions.

This will ensure:

- All personnel are trained in and adhere to waste management practices.
- Promote on-site waste minimisation, segregation, reuse, and recycling throughout the project.
- Maintain accurate, transparent records of all waste and resource management activities.

6.2 Site Inductions and Toolbox talks

All site personnel will receive **waste management and environmental induction training** before commencing work. This induction, delivered by the **Resource Manager**, will include a module on resource management and outline the key elements of the **RWMP**, including on-site waste segregation, storage procedures, and key control measures such as refuelling and hazardous material handling.

In accordance with **EPA (2021)** guidelines, the induction will cover at minimum:

- Scope and content of the RWMP;
- Project commitments and targets;
- Anticipated resources and waste types/volumes;
- Procedures for identifying and segregating resources and wastes;
- Locations and management of Waste Storage Areas (WSAs);
- Instructions on handling hazardous wastes and associated risks.

The induction will be tailored to the specific roles of site personnel—from management to operatives—and delivered by the **Contractor**. Ongoing **toolbox talks** on resource management will reinforce key practices, ensuring staff remain aware of relevant waste management procedures and control measures to maintain compliance with the RWMP.

6.3 Identifying waste collection and licences facilities

As mentioned previously, the Main contractor is responsible for coordinating waste removal with suitable waste collectors and licensed waste facilities. Waste facilities must issue a letter of acceptance to the contractor indicating acceptance and sufficient capacity for waste arising.

A list of authorised waste collectors can be found on the following website:

https://www.nwcpo.ie/permitsearch.aspx

Waste facility permits and Certificate of Registrations can be found on the following website:

http://facilityregister.nwcpo.ie

Waste facilities licensed by the EPA (Industrial Emissions or Waste Licence) is available on the following website:

https://epawebapp.epa.ie/terminalfour/waste/index.jsp?disclaimer=yes&Submit=Continue.

6.4 Resource-Efficient Supply chains

The Contractor will ensure that the supply chain is organised in line with resource and waste

best management practices. This will involve:

• Ensuring that contractors have sufficient resources to ensure supply chain competence

(i.e., environmental policies and procedures, supervision, access to advice).

• Early collaboration with supply chain to avoid waste generation, i.e., no over-ordering,

implementing take-back schemes for pallets, packaging, etc.

• Implementing a 'continuous improvement' strategy on site by maintaining good

communication

6.5 Record Keeping

The Contractor, through the appointed Resource Manager, shall ensure that full details of all material deliveries, on-site movements, and construction and

demolition) waste generation are accurately recorded throughout the Construction Phase.
Each construction and demolition waste consignment entering or leaving the site will be tracked and documented to maintain full traceability from source to final destination, with a separate record completed for each load.
Details in the site tracking system to be recorded are as follows:

For each movement of resource off-site, a signed docket/invoice will be obtained by the **Resource Manager** from the haulier/contractor detailing the following:

- Name the resource / waste stream.
- List of Waste (Low) Code for each stream (where applicable).
- Quantity of material moved off-site by the haulier/contractor (tonnes).

Waste haulage details:

- Name and authorisation of the haulier responsible for transporting the material.
- For *waste materials*, a valid Waste Collection Permit (WCP) is required.

(For ***by-products*** or materials not classified as waste, a WCP is not necessary)

- In all cases, the vehicle registration number must be recorded for each load removed from site.

Name and authorisation of the destination site receiving the resource.

- For *waste materials*, this requires a valid Certificate of Registration, Waste Permit, or Waste Licence.
- For ***by-products*****,** the relevant by-product determination must be documented.

This determination is based on the by-product test which is based on the EPA requirements of Regulation 27 of the European Communities (Waste Directive) Regulations 2011

This determination is made in accordance with the **by-product test** set out under Regulation 27 of the European Communities (Waste Directive) Regulations 2011, as required by the EPA.

For a material to be considered a by-product (not waste), it must satisfy all four of these conditions set by the EPA

- Certainty of further use
- Direct usability
- Integral part of production
- Lawful and no adverse impact

Additional guidance can be found here:

https://www.epa.ie/publications/licensing--permitting/waste/by-product-notification-form-guidance.php

All waste contractors must provide details of the final destination of each waste stream and the treatment method applied (e.g., recycling, recovery, or disposal) in their waste reports.

All information will be recorded using a waste register template. This template should be broken down by material type and linked to delivery and removal records. This will enable accurate calculation of the percentage of residual material (waste) generated for each resource.

This tracking system will allow the project team to measure performance against established targets for waste prevention, reuse, and recovery, helping to identify areas of strong p3erformance and opportunities for improvement.

							Collection details				Transfer details		
Date	Waste Description type	LoW /EWC codes	Storage Location	Hazardous (Yes/No)	Quantity (Tonnes)	Waste Treatment operation	Collected by	Permit No.	Vehicle details	Vehicle listed in waste collection permit appendix C	Transferred to		
											Facility Name	Address (Eircode)	Licence/Permit /COR No

Figure 6. Example of Waste Register Template

6.6 Communication with Local Authority / Stakeholders

Throughout the construction phase, the Resource Manager will communicate regularly with all relevant stakeholders to ensure effective resource and waste management. This includes:

- Internal reporting of resource and waste statistics to the Client, Contractor management, and the wider construction team. Reporting will include performance relative to agreed targets and objectives and may be incorporated as an agenda item at site meetings.
- Engagement with the local authority (e.g., Cork County Council) regarding site inspections or enforcement audits. All follow-up and corrective actions will be logged and reported to the authority. Such reporting may be required as a condition of planning and may require formal sign-off for compliance.
- Communication with other stakeholders, including the EPA, public, or other relevant parties, as appropriate, regarding resource and waste management activities on site.
- Post-project reporting: Upon completion of construction, the RM will prepare a final report summarising the outcomes of resource management processes, including total reuse and recovery figures and the final destinations of all resources taken off-site. This report will be issued to the Client, Contractor management, and the local authority.

The Resource Manager will ensure that communication is timely, accurate, and in accordance with EPA (2021) guidelines, supporting transparency, compliance, and continuous improvement in resource and waste management throughout the project.

6.7 Inspection and Audits

All waste contractors must provide details of the final destination of each waste stream and the treatment method applied (e.g., recycling, recovery, or disposal) in their waste reports.

All information will be recorded by material type and linked to delivery and removal records, enabling calculation of the percentage of residual material generated for each resource. This system allows the project team to measure performance against established targets for waste prevention, reuse, and recovery, highlighting areas of success and opportunities for improvement.

To support this, routine waste audits will be conducted to assess the composition of waste generated on site. These audits will analyse waste patterns, categories, and opportunities for reduction, recycling, or reuse. Detailed records of each audit—including methodology, findings, and action plans—will be maintained, along with documentation of waste categories, quantities, and diversion rates for future reference.

Checklists for daily, weekly, or monthly site audits will be prepared by the Resource Manager, and relevant personnel will be informed of their responsibilities. On-site and off-site inspections will monitor waste management practices, including segregation stations, recycling efforts, storage areas, and compliance with eco-friendly packaging and minimal waste generation standards.

Additionally, site workers will receive proper training on waste management best practices, emphasising correct segregation, recycling, and responsible disposal.

7.0 SITE INFRASTRUCTURE

7.1 Signage and Staff Awareness

The Contractor is responsible for ensuring that all site personnel are aware of proper waste segregation and management practices. Clear signage will be installed to identify waste collection areas and bins. Verbal instructions through training sessions and toolbox talks will reinforce correct housekeeping, waste segregation, and handling procedures.

7.2 Resources and waste Storage

Designated, secure, and suitably sized waste storage areas will be established within the site compound and at other appropriate locations. These areas will allow for the safe storage, segregation, and handling of all waste streams prior to transport for recovery or disposal at licensed/permitted facilities.

Non-Hazardous Waste: Dedicated bins or skips, potentially colour-coded, will be provided for typical construction waste, including:

- Mixed/general waste
- Bulky waste
- Metal
- Dry mixed waste
- Wood
- Organic waste

Note: Burning or burial of waste on-site is strictly prohibited.

Hazardous Waste: Hazardous materials may include:

- Fuel
- Oil
- Waste electrical and electronic equipment (WEEE)
- Construction chemicals (cement, sealant, paints, etc.)
- Sewage

- Contaminated soil (e.g., fuel or oil spills)

All hazardous materials and liquid wastes (chemicals, lubricants, adhesives, waste oils, paints) will be stored in appropriate, bunded containers to prevent contamination of surface water or soil.

Hazardous waste will be safely removed from site by a permitted collector once sufficient quantities are accumulated for transport.

7.3 Labelling and stockpile management

All waste storage containers and areas will be clearly labelled. Waste stockpiles will be managed to maintain safe storage conditions, ensure correct segregation, and facilitate transport for recovery or disposal.

16.0 CLIMATE

16.1 Introduction

This chapter assesses the potential climate impact of the proposed development at the Cara Partners site at Little Island Industrial Estate, Co. Cork. The assessment of impacts has been undertaken in the context of current relevant standards and guidance and identifies any requirements or possibilities for mitigation. A full description of the development can be found in Chapter 2 - Description of Proposed Development.

Sarah Berry is a Principal Climate Consultant in AWN's Air and Climate Team. She holds a BSc in Physical Geography from the University of Leeds. She has 9 years' experience in climate change and sustainability, with expertise in greenhouse gas permitting, accounting and verification. Her experience includes conducting strategic sector-specific GHG audits across a range of industries (data centres, industrial facilities, hospitals, manufacturing, power stations and airports). She has prepared climate chapters for EIARs for proposed developments across Ireland including large residential developments, windfarms, industrial developments and wastewater treatment works.

This chapter was prepared by Caolán Leneghan, Senior Climate Change Consultant at AWN Consulting. Caolán holds degrees in Geography and International Development (Maynooth University) and Disaster Risk Management & Climate Change Adaptation (Lund University, Sweden). With over five years' experience, he specialises in climate risk assessment, adaptation strategy, and advisory services across sectors including infrastructure (including residential), transport, energy, urban planning, and water. He has also supported international development and climate resilience advising The World Bank, MDBs and UK government on climate adaptation and delivering guidance for assessment.

16.2 Characteristics of the Proposed Development

16.2.1 General Characteristics of the Proposed Development

The proposed development comprises various elements to be developed on a phased basis over a period of ten years. A proposed site layout drawing is presented in Drg. Ref. 5340-PLA-XXX-DR-DJF-AR-0010.

The proposed development comprises various elements to be developed on a phased basis over a period of ten years. A proposed site layout drawing is presented in Drg. Ref. 5340-PLA-XXX-DR-DJF-AR-0010.

1. **Unit 1 Production Building** – Construction of a replacement, multi-storey Unit 1 Production building approx. 34m L x 23m W x 26m H (approx. 3,000m2).

2. **In Process Tank Farm Bund** – Modifications to the existing 'In Process Tank Farm' bund and ancillary plant and services related to same including pipe racks.

3. **Laboratory Gas Bottle Store** – Construction of a new Laboratory Gas Bottle Store approx. 4m L x 2m W x 4m H and ancillary plant and services related to same including pipe racks.

4. **Regenerative Thermal Oxidiser** – Provision of a new Regenerative Thermal Oxidiser, associated exhaust stack (approx. 10mAGL) and ancillary plant and services related to same including pipe racks.

5. **Process Cooling** – Provision of 1no. process cooling tower (approx. 5mAGL) to be installed to provide additional cooling for manufacturing processes and ancillary plant and services related to same including pipe racks.

6. **Combined Heat and Power Plant and Heat Recovery System** – addition of a new natural-gas fired containerised combined heat and power (CHP) plant (approx. 6 MW_{TH} Total Rated Thermal Input) and associated containerised waste heat boiler system with exhaust stack approx. 13mAGL and ancillary plant, kiosks and services related to same including pipe racks.

7. **Ethanol Storage Tank** – addition of a new ethanol storage tank (2.4m diameter x 7m H) in existing solvent tank farm bund and ancillary plant and services related to same including pipe racks.

8. **Car Park** – extension to existing car park including associated lighting to provide a net increase of additional 67no. permanent car parking spaces.

9. **Wastewater Treatment Plant (WWTP) Control and Blower Building** - Single storey building associated with WWTP expansion, approx. 11m L x 10m W x 4m H (approx. 90m2); and ancillary plant and services related to same including pipe racks.

10. **WWTP Chemical storage tanks and bund** – new concrete base and bund (approx. 45m2) with tanks approx. 3.5m H and ancillary plant and services related to same including pipe racks.

11. **WWTP Inlet works** – new screens, tanks up to approx. 9m H and ancillary plant and services related to same including pipe racks

12. **WWTP Dissolved Air Flotation tank** – new tank approx. 5m L x 2m W x 4m H and ancillary plant and services related to same including pipe racks.

13. **Site Works** – All associated site services, site development works and landscaping to facilitate the proposed development.

16.2.2 Specific Characteristics of the Proposed Development

In relation to climate, impacts will occur during both the construction and operational phases of the development. During the construction stage the main source of climate impacts will be because of GHG emissions and embodied carbon associated with the proposed construction materials and activities for the proposed development.

During the operational phase GHG emissions associated with energy used by plant and equipment will impact the climate. In addition, the vulnerability of the proposed development in relation to future climate change must be considered during the operational phase.

16.3 Legislation, Policy and Guidance

16.3.1 International legislation

The Paris Agreement (UNFCCC, 2015), which entered into force in 2016, is an important milestone in terms of international climate change agreements and includes an aim of limiting global temperature increases to no more than 2°C (degrees Celsius) above pre-industrial levels with efforts to limit this rise to 1.5°C. Nationally determined contributions (NDCs) are at the heart of the Paris Agreement and the achievement of these long-term goals. NDCs comprise the efforts and actions by each country to reduce national emissions and adapt to the impacts of climate change. The Paris Agreement requires each country to prepare the NDCs that it intends to achieve, updating and enhancing the NDCs every 5 years. Countries are required to implement mitigation measures, with the aim of achieving the objectives of such contributions. Each of the EU Member States submit their own NDCs, which contribute to the overall EU NDC.

The European Green Deal, published by the European Commission in December 2019, provides an action plan which aims for the EU to be climate neutral by 2050. The EU Green Deal highlights that further decarbonisation of the energy sector is critical to reach climate objectives in 2030 and 2050. The European Green Deal has increased the GHG emissions reduction 2030 target to at least 55% in comparison to 1990 levels.

On 14 July 2021, the European Commission adopted a series of legislative proposals setting out how it intends to achieve climate neutrality in the EU by 2050, including the intermediate target of at least a 55% net reduction in greenhouse gas emissions by 2030. The package of proposals is known as the 'Fit for 55' package.

The package includes revisions to the legislation put forward as part of the Climate and Energy Framework 2021-2030, including the EU Emissions Trading System (ETS), Effort Sharing Regulation, transport and land use legislation, setting out in real terms the ways in which the Commission intends to reach EU climate targets under the European Green Deal.

The EU ETS was launched in 2005 as the world's first international company- level 'cap-and trade' system for reducing emissions of greenhouse gases cost-effectively. The EU ETS regulates the GHG emissions of larger industrial emitters including electricity generation, cement manufacturing and heavy industry.

Under this new package of legislative proposals, the sectors of the Irish economy covered by the current ETS must reduce emissions by 42% by 2030 compared to 2005 levels by increasing annual emissions reduction to 4.2% per annum.

The non-ETS sector includes all domestic GHG emitters which do not fall under the ETS scheme and thus includes GHG emissions from transport, residential and commercial buildings and agriculture. These sectors must reduce emissions by 42% by 2030 compared to 2005 levels.

Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law') writes into law the goal set out in the European Green Deal for Europe's economy and society to become climate-neutral by 2050. The

law also sets the intermediate target of reducing net greenhouse gas (GHG) emissions by at least 55% by 2030, compared to 1990 levels.

The 2021 EU Strategy on Adaptation to Climate Change sets out the pathway to prepare for the unavoidable impacts of climate change. The aim is that "*by 2050, when we aim to have reached climate neutrality, we will have reinforced adaptive capacity and minimised vulnerability to climate impacts…"*

Adaptation refers to measures that can reduce the negative impact of climate change by, for example, ensuring a project is resilient to future increases in storm frequency and rainfall levels.

The EU has adopted integrated monitoring and reporting rules to ensure progress towards its 2030 climate and energy targets and its international commitments under the 2015 Paris Agreement.

Climate is also addressed specifically in Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment. Recital (7) of Directive 2014/52/EU states that:

"*Over the last decade, environmental issues, such as resource efficiency and sustainability, biodiversity protection, climate change, and risks of accidents and disasters, have become more important in policy making. They should therefore also constitute important elements in assessment and decision-making processes*".

Recital (13) of Directive 2014/52/EU states that:

"*Climate change will continue to cause damage to the environment and compromise economic development. In this regard, it is appropriate to assess the impact of projects on climate (for example greenhouse gas emissions) and their vulnerability to climate change*".

Additionally Annex IV requires the following to be considered within Environmental Impact Assessment:

- Paragraph 4*: "A description of the factors specified in Article 3(1) likely to be significantly affected by the project: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydro morphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape"*.
- Paragraph 5 (f): *"A description of the likely significant effects of the project on the environment resulting from, inter alia: the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change"*.

16.3.2 National Legislation

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) (as amended) was enacted (the Act). The purpose of the Act was to enable Ireland *"to pursue, and achieve, the transition to a low carbon, climate resilient and*

environmentally sustainable economy by the end of the year 2050" (3.(1) of No. 46 of 2015). This is referred to in the Act as the *"national transition objective".* The Act made provision for a national mitigation plan, and a national adaptation framework. In addition, the Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

The first Climate Action Plan (CAP) was published by the Irish Government in June 2018 (Government of Ireland, 2018). The Climate Action Plan 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The fifth and most recent climate action plan, CAP25, was published in April 2025 (Government of Ireland, 2025).

Following on from Ireland declaring a climate and biodiversity emergency in May 2019, and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme in December 2019, followed by the publication of the Climate Action and Low Carbon Development (Amendment) Bill 2021 (hereafter referred to as the 2021 Climate Bill) in March 2021. The Climate Act was signed into Law on the 23rd of July 2021, giving statutory effect to the core objectives stated within the CAP.

The purpose of the 2021 Climate Act (Government of Ireland, 2021) is to provide for the approval of plans "*for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050*". The 2021 Climate Act will also *"provide for carbon budgets and a decarbonisation target range for certain sectors of the economy".* The 2021 Climate Act defines the carbon budget as *"the total amount of greenhouse gas emissions that are permitted during the budget period".*

In relation to carbon budgets, the 2021 Climate Action and Low Carbon Development (Amendment) Act states *"A carbon budget, consistent with furthering the achievement of the national climate objective, shall be proposed by the Climate Change Advisory Council, finalised by the Minister and approved by the Government for the period of 5 years commencing on the 1 January 2021 and ending on 31 December 2025 and for each subsequent period of 5 years (in this Act referred to as a 'budget period')"*. The carbon budget is to be produced for 3 sequential budget periods, as shown in Table 16-1. The carbon budget can be revised where new obligations are imposed under the law of the European Union or international agreements or where there are significant developments in scientific knowledge in relation to climate change. In relation to the sectoral emissions ceiling, the Minister for the Environment, Climate and Communications (the Minister for the Environment) shall prepare and submit to government the maximum amount of GHG emissions that are permitted in different sectors of the economy during a budget period and different ceilings may apply to different sectors. The sectorial emission ceilings for 2030 were published in July 2022 and are shown in Table 16-2. Industry has a 35% reduction requirement and a 2030 emission ceiling of 4 Mt CO_2e.

Table 16-1 5-Year carbon budgets 2021-2025, 2026-2030 and 2031-2025.

Budget Period	Carbon Budget	Reduction Required
2021-2025	295 Mt CO_2e	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO_2e	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO_2e	Reduction in emissions of 3.5% per annum for the third provisional budget.

Table 16-2 Sectoral emission ceilings 2030 (Government of Ireland, 2025).

Sector	Baseline (Mt CO_2eq)	Carbon Budgets (Mt CO_2eq)		2030 Emissions (Mt CO_2eq)	Indicative Emissions % Reduction in Final Year of 2025- 2030 Period (Compared to 2018)
	2018	2021-2025	2026-2030		
Electricity	10	40	20	3	75
Transport	12	54	37	6	50
Built Environment - Residential	7	29	23	4	40
Built Environment - Commercial	2	7	5	1	45
Industry	7	30	24	4	35
Agriculture	23	106	96	17.25	25
Other (F-gases, waste, petroleum refining)	2	9	8	1	50
Land Use, Land-use Change and Forestry (LULUCF)	5	Reflecting the continued volatility for LULUCF baseline emissions to 2030 and beyond, CAP25 puts in place ambitious activity targets for the sector reflecting an EU-type approach.			
Total	68				
Unallocated Savings	-	-	26	-5.25	-
Legally Binding Carbon Budgets and 2030 Emission Reduction Targets	-	295	200	-	51

16.4 Policy

16.4.1 Greenhouse Gas Policy

In December 2023, CAP24 was published, establishing key actions to deliver a 51% reduction in GHG emissions by 2030 (compared to 2018 levels) and achieve climate neutrality by 2050 (Government of Ireland, 2023). The updated and current CAP25, published in April 2025 (Government of Ireland, 2025), builds on the progress of the previous four iterations of the CAP, with CAP23 first publishing carbon budgets and sectoral emission ceilings, and reaffirms Ireland's climate ambition, with a focus on delivery, implementation and measurable outcomes, particularly ahead of the second carbon budget period (2026–2030). 2025 is the last year in the first 5-year carbon budget period. During the initial 5-year budget period the average annual reduction required was 4.8%, this increases to 8.3% in the second budget period (2026-2030). CAP25 retains the high-impact sectors where the biggest savings can be achieved, while emphasising public sector leadership and green procurement. These sectors include renewable energy; energy efficiency of buildings; transport; sustainable farming; sustainable business; and land-use change.

CAP25 also includes targeted actions to decarbonise industrial heat and support the transition to carbon-neutral manufacturing processes. Public sector leadership is strengthened through a new *Buying Greener: Green Public Procurement Strategy and Action Plan* (2024–2027) (Government of Ireland, 2024a) the development of mandatory Climate Action Roadmaps, and enhanced emissions monitoring and reporting across government operations. The government has reinforced the public sector's responsibility to lead by example, particularly through climate-proofing operations and sustainable procurement initiatives. To support innovation and ensure future economic resilience, IDA Ireland continues to attract and support businesses investing in climate technologies and low-carbon solutions.

CAP25 highlights a significant 17% reduction in electricity emissions in early 2024, with wind power supplying nearly 40% of Ireland's total electricity demand and over 100,000 rooftop microgenerators connected to the grid. Investments are ongoing in grid reinforcement, offshore wind development, and interconnectors with France and the UK to enhance renewable generation capacity. According to legal and policy analysts, these developments place Ireland among the top countries globally in per capita wind generation, while continuing to expand domestic and community-based renewable energy. EirGrid, Enterprise Ireland and IDA Ireland have recently signed an MoU to collectively support offshore wind development in Ireland.

CAP25 also reinforces targets first outlined in CAP24 to reduce the embodied carbon of construction materials, with a 10% reduction by 2025 and 30% reduction by 2030 for materials produced and used in Ireland. Cement and high embodied carbon construction materials can be reduced through product substitution, reduced clinker content in cement and uptake of low-carbon construction methods, including those outlined in the Construction Industry Federation 2021 report *Modern Methods of Construction* (Construction Industry Federation, 2021). There also remains scope for the construction industry to use more timber in construction. In 2022, 24% of new construction in Ireland was built using timber frames to satisfy the demand for housing. Public bodies are now required under the Public Sector Mandate to use best practice

project design to reduce embodied carbon; procure concretes with clinker replacements (lower carbon); and require that large construction projects produce a whole life cycle GHG emissions assessment. Further guidance on how the built environment can contribute to a circular, low-carbon economy is detailed in the recently published *A Roadmap for a Resource Efficient Circular Built Environment.*

Furthermore, CAP25 advances sector-specific measures in green procurement, electrification of transport and heat, and just transition (with the introduction of a Just Transition Commission) to support vulnerable communities and ensure equitable decarbonisation. While transport emissions increased by 0.3%, electric vehicles and the expanded use of biofuels are highlighted as the most effective short- to medium-term strategies for emissions reductions in the sector.

In April 2023 the Government published a draft *Long-Term Strategy on Greenhouse Gas Emissions Reductions* (Government of Ireland, 2024b). This strategy provides a long-term plan on how Ireland will transition towards net carbon zero by 2050, achieving the interim targets set out in the Climate Action Plan.

The *Cork City Council (CCC) Climate Action Plan 2024-2028* (CCC, 2024) outlines the Council's commitment to achieving significant reductions in GHG emissions while preparing for the impacts of climate change. The plan is informed by Cork's participation in the EU Mission for Climate-Neutral and Smart Cities, which sets ambitious goals, including a transition to net-zero emissions by 2030.

The *Cork City Climate Action Plan 2024-2028* highlights the increasing risks posed by climate change to the city's infrastructure, residents, and businesses, particularly from extreme weather events such as flooding, heatwaves, and droughts. Pluvial, fluvial, and coastal flooding are identified as significant risks due to rising sea levels and more intense rainfall events. Without mitigation, these events are projected to lead to the inundation of properties, damage to infrastructure, and disruptions to transport networks.

Flood-relief measures, including both engineered and nature-based solutions, such as Sustainable Urban Drainage Systems (SuDs), have been incorporated into city planning. Recent and ongoing works, including those in Togher, Douglas, and the Lower Lee flood protection schemes, will enhance Cork's resilience to future flooding risks.

The Cork County Council Climate Action Plan 2024–2029 (CCC, 2024) sets out a comprehensive framework for climate mitigation and adaptation across Cork County, aiming to reduce greenhouse gas (GHG) emissions by 51% by 2030 (from a 2018 baseline) and to achieve climate neutrality by 2050. The plan aligns with national and EU climate objectives and is structured around a place-based approach, with a strong emphasis on community engagement and a just transition.

This Climate Action Plan sets a pathway for Cork County Council to actively translate national climate policy to local circumstances with the prioritisation and acceleration of evidence-based measures including to:

- Reduce its direct carbon emissions by 51% by 2030;
- Assist in the delivery of the climate neutrality objective at local and community levels; and

- Identify and support the development of a Decarbonising Zone (DZ) within the local authority area

The plan is built around five key thematic areas:

- Governance and Leadership
- Built Environment and Infrastructure
- Transport
- Natural Environment, Biodiversity and Land Use
- Circular Economy and Resource Management

16.4.2 Climate Change Vulnerability Policy

The Second National Adaptation Framework (NAF) (Government of Ireland, 2024c), published in June 2024 under the Climate Action and Low Carbon Development Act 2015, outlines a comprehensive, whole-of-government and whole-of-society approach to climate adaptation. Its core objective is to enhance Ireland's resilience to a wide range of climate risks, including extreme weather events, flooding, drought, biodiversity loss, sea level rise, and rising temperatures.

Building on the principles of a "Just Transition", the NAF introduces the concept of "Just Resilience'', envisioning a climate-resilient Ireland that ensures fairness, equity, and inclusivity in adaptation planning and implementation. It promotes reduced reliance on fossil fuels, the expansion of electrified and accessible public transport, and the integration of sustainability and climate resilience across all sectors. These include energy, water, wastewater, agriculture, transport, health, built environment, and biodiversity, with a strong emphasis on mainstreaming adaptation practices into policy, planning, and operations.

With respect to the wastewater sector, the 2nd NAF highlights several potential climate impacts and risks and adaptation measures:

- **Increased frequency and intensity of rainfall** events may overwhelm combined sewer systems, leading to overflows and pollution incidents. This necessitates the upgrading of sewer infrastructure, separation of stormwater and wastewater systems, and enhanced real-time monitoring and control systems.
- **Flooding and sea level rise** pose risks to low-lying wastewater treatment plants and pumping stations, requiring flood defences, elevation of critical infrastructure, and relocation strategies for highly vulnerable assets.
- **Extended drought** periods can reduce dilution capacity in receiving waters, impacting effluent discharge standards and ecological health. Adaptive responses include improved water reuse systems, advanced treatment technologies, and dynamic discharge permitting.
- **Temperature increases** may affect biological treatment processes, altering microbial activity and reducing treatment efficiency. This calls for process optimization, temperature-resilient technologies, and contingency planning for operational adjustments.

- **Storm surges and coastal erosion** threaten coastal wastewater infrastructure, prompting the need for reinforced structural designs, strategic retreat planning, and integration of nature-based solutions such as constructed wetlands for resilience.
- **Power outages during extreme weather events** can disrupt wastewater operations, highlighting the importance of backup power systems, decentralised treatment options, and emergency response protocols.

The National Climate Change Risk Assessment Main Report (NCCRA) was published in June 2025 (EPA, 2025d). The NCCRA was required to be developed under Action 457 from the 2021 CAP (Government of Ireland, 2021). Action 457 seeks to "Further develop Ireland's national climate change risk assessment capacity to identify the priority physical risks of climate change to Ireland'. The NCCRA uses definitions of the risk determinants from the Intergovernmental Panel on Climate Change (IPCC) Risk Framework (IPCC, 2023):

- **Hazard** - the potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources
- **Exposure** - the presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected
- **Sensitivity** - refers to the degree to which a system or asset is affected by climate hazards. It reflects how vulnerable something is to changes such as temperature extremes, flooding, or drought, based on its physical, functional, or ecological characteristics.
- **Vulnerability** - the propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts including sensitivity
- **Risk** - the potential for adverse consequences for human or ecological systems.

When considering risk, the NCCRA assess exposure and vulnerability for two future climate change scenarios or Representative Concentration Pathways (RCPs):

- **RCP4.5** was selected as it represents a scenario aligned with the global temperature trajectory
- **RCP8.5** was selected as it represents a high-emissions scenario and achieves the highest level of modelled temperature increases by the end of the century. Consequently, this scenario will result in the highest level of physical risk for Ireland, and therefore the greatest requirement for adaptation.

These scenarios align with a conservative approach to assess risks to Ireland and assumes global emission reduction targets are not met. This aligns with the principle of precaution as stated in the NAF (Government of Ireland, 2024b). In addition to the future climate scenarios, the NCCRA assesses the risk from the future climate during the following timeframes:

- Present (~2030)
- Medium term (2040-2070) (~ 2050)
- Long term (2070-2100) (~2100)

It is recommended that the Environmental Impact Assessment (EIA) for climate risk and vulnerability evaluates risks across the lifecycle of the proposed development—construction and operational phases. For this project, future climate risk has been assessed using the 2050s timeframe.

16.4.3 Guidance

The principal guidance and best practice documents used to inform the assessment of potential impacts on climate are summarised below.

- Guidelines on the Information to be contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA, 2022);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);

The assessment has referred to national guidelines where available, in addition to international standards and guidelines relating to the assessment of climate impacts. These are summarised below:

- Environmental Protection Agency (2024) National Climate Change Risk Assessment Technical Guidance for Sectoral Assessment;
- Transport Infrastructure Ireland (TII) GE-GEN-01101: Guide to the Implementation of Sustainability for TII Projects (TII, 2023);
- Transport Infrastructure Ireland (TII) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (TII, 2022);
- Transport Infrastructure Ireland (TII) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document (TII, 2025a);
- Transport Infrastructure Ireland (TII) PE-ENV-01106: Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document (TII, 2025b);
- International Standards Organisation (2021) ISO 14091:2021 ‘Adaptation to Climate Change
- Institute of Sustainability and Environmental Professionals (ISEP) (formerly the Institute of Environmental Management & Assessment (IEMA)) Environmental Impact Assessment Guide to: Assessing GHG Emissions and Evaluating their Significance (hereafter referred to as the ISEP 2022 GHG Guidance) (ISEP, 2022);
- ISEP Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (hereafter referred to as the ISEP Climate Change guidance) (ISEP, 2020a);
- ISEP Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (hereafter referred to as the ISEP 2020 EIA Guide) (ISEP, 2020a);
- ISEP GHG Management Hierarchy (hereafter referred to as the ISEP 2020 GHG Management Hierarchy) (ISEP, 2020b); and
- Technical guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021).

16.5 Methodology

The climate assessment is divided into two distinct sections – a greenhouse gas assessment (GHGA) and a climate change risk assessment (CCRA):

- Greenhouse Gas Emissions Assessment (GHGA) – Quantifies the GHG emissions from a project over its lifetime. The assessment compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude; and
- Climate Change Risk Assessment (CCRA) – Identifies the impact of a changing climate on a project and receiving environment. The assessment considers a project's vulnerability to climate change and identifies adaptation measures to increase project resilience.

16.5.1 Greenhouse Gas Assessment

As per the EU guidance document *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (European Commission, 2013) the climate baseline is first established with reference to EPA data on annual GHG emissions (see section 16.6.1).

16.5.1.1 Construction Phase

The GHG assessment has been conducted following the TII PE-ENV-01104 guidance (TII, 2022). PE-ENV-01104 (TII, 2022) recommends the calculation of the construction stage GHG emissions, including embodied carbon, using the TII Online Carbon Tool (TII, 2025a). Embodied carbon refers to the sum of the carbon needed to produce a good or service. It incorporates the energy needed in the mining or processing of raw materials, the manufacturing of products and the delivery of these products to site. The TII Online Carbon Tool (TII, 2025) has been commissioned by TII to assess GHG emissions associated with road or rail projects using Ireland-specific emission factors and data. However, the tool can be used to estimate the GHG emissions from other development types such as the proposed project as a number of the material types and activities are somewhat similar. The tool uses emission factors from recognised sources including the Civil Engineering Standard Method of Measurement (CESSM) Carbon and Price Book database (CESSM, 2013), which can be applied to a variety of developments, not just road or rail. The tool aligns with PAS 2080.

The purpose of the embodied carbon assessment is to engage the design team in the consideration of embodied carbon at an early stage in the development and mitigate embodied carbon. This engagement aims to ensure carbon savings are made and to assist in aligning the project to Ireland's CAP goal of Net Carbon Zero by 2050.

The TII Carbon Tool has been used to assess the GHG emissions associated with site clearance works, excavation works, construction materials, material transport, energy usage during construction, construction worker travel and construction waste. Reasonable conservative estimates have been used in this assessment where necessary to provide an estimate of the GHGs associated with the proposed development.

16.5.1.2 Operational Phase

The TII Carbon Tool has also been used to assess the GHG emissions associated with new Combined Heat and Power Plant (CHP), Regenerative Thermal Oxidiser (RTO), Process Cooling Tower and Dissolved Air Flotation Tank. The natural gas CHP is the most significant contributor to GHG emissions annually across the proposed development.

The potential for operational stage road traffic has been reviewed and a detailed air quality assessment, and therefore detailed climate assessment of operational road traffic emissions has been scoped out (see Chapter 6 – Air Quality) as there is no potential for the PE-ENV-01107 criteria (TII, 2025b) to be exceeded.

16.5.1.3 Significance Criteria for GHGA

The Transport Infrastructure Ireland (TII) guidance document entitled *PE-ENV-01104 Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document* (TII, 2022) outlines a recommended approach for determining the significance of both the construction and operational phases of a development.

The significance of GHG effects set out in PE-ENV-01104 (TII, 2022) is based on ISEP GHG Guidance (ISEP, 2022) which is consistent with the terminology contained within Figure 3.4 of the EPA's (2022) '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*'.

The ISEP GHG Guidance (ISEP, 2022) sets out the following principles for significance:

- When evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. The significance of a project's emissions should therefore be based on its net impact over its lifetime, which may be positive, negative or negligible;
- Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project's residual emissions at all stages; and
- Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project's remaining emissions should be considered.

The criteria for determining the significance of effects are a two-stage process that involves defining the magnitude of the impacts and the sensitivity of the receptors (i.e. Ireland's National GHG targets). In relation to climate, there is no project specific assessment criteria, but the project will be assessed against the recommended TII significance determination. This takes account of any embedded or committed mitigation measures that form part of the design which should be considered.

TII (TII, 2022) states that professional judgement must be taken into account when contextualising and assessing the significance of a project's GHG impact. In line with ISEP GHG Guidance (ISEP, 2022), TII state that the crux of assessing significance is "*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes*

to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050".

Significance is determined using the criteria outlined in Table 16-3 (derived from Table 6.7 of PE-ENV-01104 (TII, 2022)) along with consideration of the following two factors:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

Table 16-3 Greenhouse gas assessment (GHGA) significance criteria.

Effects	Significance Level Description	Description
Significant Adverse	Major Adverse	The project's GHG impacts are not mitigated. The project has not complied with do-minimum standards set through regulation, nor provided reductions required by local or national policies; and No meaningful absolute contribution to Ireland's trajectory towards net zero.
	Moderate Adverse	The project's GHG impacts are partially mitigated. The project has partially complied with do-minimum standards set through regulation, and have not fully complied with local or national policies; and Falls short of full contribution to Ireland's trajectory towards net zero.
Not Significant	Minor Adverse	The project's GHG impacts are mitigated through 'good practice' measures. The project has complied with existing and emerging policy requirements; and Fully in line to achieve Ireland's trajectory towards net zero.
	Negligible	The project's GHG impacts are mitigated beyond design standards. The project has gone well beyond existing and emerging policy requirements; and Well 'ahead of the curve' for Ireland's trajectory towards net zero.
	Beneficial	The project's net GHG impacts are below zero and it causes a reduction in atmosphere GHG concentration. The project has gone well beyond existing and emerging policy requirements; and Well 'ahead of the curve' for Ireland's trajectory towards net zero, provides a positive climate impact.

Ireland's carbon budgets can also be used to contextualise the magnitude of GHG emissions from the proposed development (TII, 2022). The approach is based on comparing the net proposed development GHG emissions to the relevant carbon budgets (Government of Ireland, 2025). With the publication of the Climate Action Act in 2021 and CAP25, sectoral carbon budgets have been published for comparison with the net GHG emissions from the proposed development over its lifespan.

16.5.2 Climate Change Risk Assessment

An initial screening of risk during the operational phase is conducted, according to the TII guidance PE-ENV-01104. This is carried out by determining the sensitivity of proposed development assets (i.e. receptors) and their exposure to climate change hazards.

The proposed development asset categories must be assigned a level of sensitivity to climate hazards. PE-ENV-01104 (TII, 2022) provides the list of asset categories and climate hazards to be considered. The asset categories will vary for development type and need to be determined on a development-by-development basis.

- **Asset Categories:** Pavements; drainage; structures; utilities; landscaping; signs, light posts, buildings, and fences.
- **Climate Hazards:** Flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning and hail; landslides; fog.

First an initial screening of physical hazards is carried out based on the proposed site location (Table 16-6). This is a qualitative screening which intends to only proceed with relevant hazards (e.g., sea level rise is not an applicable hazard to inland areas or wildfire is not considered a hazard in an urban location). Following this relevant hazard will continue to be assessed on their exposure under future climate change.

The sensitivity is based on a High, Medium or Low rating with a score of 1 to 3 assigned as per the criteria below.

- **High Sensitivity -** The climate hazard will or is likely to have a major impact on the asset category. This is a sensitivity score of 3.
- **Medium Sensitivity** - It is possible or likely the climate hazard will have a moderate impact on the asset category. This is a sensitivity score of 2.
- **Low Sensitivity** - It is possible the climate hazard will have a low or negligible impact on the asset category. This is a sensitivity score of 1.

Once the sensitivities have been identified the exposure analysis is undertaken. The exposure analysis involves determining the level of exposure of each climate hazard at the project location irrespective of the project type. For example, flooding could be a risk if the project location is next to a river in a floodplain. Exposure is assigned a level of High, Medium or Low as per the below criteria.

- **High Exposure:** It is almost certain or likely this climate hazard will occur at the project location, i.e. might arise once to several times per year. This is an exposure score of 3.
- **Medium Exposure:** It is possible this climate hazard will occur at the project location, i.e. might arise a number of times in a decade. This is an exposure score of 2.
- **Low Exposure:** It is unlikely or rare this climate hazard will occur at the project location, i.e. might arise a number of times in a generation or in a lifetime. This is an exposure score of 1.

Once the sensitivity and exposure are categorised, a vulnerability analysis is conducted by multiplying the sensitivity and exposure to calculate the vulnerability.

16.5.2.1 *Significance Criteria for CCRA*

The CCRA involves an initial screening assessment to determine the vulnerability of the proposed development to various climate hazards. The vulnerability is determined by combining the sensitivity and the exposure of the proposed development to various climate hazards.

Vulnerability = Sensitivity x Exposure

The vulnerability assessment takes any proposed mitigation into account. Table 16-4 details the vulnerability matrix; vulnerabilities are scored on a high, medium and low scale.

TII guidance (TII, 2022) and the EU technical guidance (European Commission, 2021a) note that if all vulnerabilities are ranked as low in a justified manner, no detailed climate risk assessment may be needed. Therefore, the impact from climate change on the proposed development can be considered as not significant.

However, where residual medium or high vulnerabilities exist the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks. An assessment of construction phase CCRA impacts is only required according to the TII guidance (TII, 2022) if a detailed CCRA is required.

Table 16-4 Vulnerability matrix.

		Exposure		
		High (3)	Medium (2)	Low (1)
Sensitivity	**High (3)**	9 - High	6 – High	3 - Medium
	Medium (2)	6 - High	4 - Medium	2 - Low
	Low (1)	3 - Medium	2 – Low	1 - Low

The screening CCRA, detailed in section 16.7.2, did not identify any residual medium or high risks to the proposed development as a result of climate change. Therefore, a detailed CCRA for the construction and operational phase were scoped out.

While a CCRA for the construction phase was not required, best practice mitigation against climate hazards is still recommended in as outlined in section 16.8.1.

16.6 Receiving Environment

16.6.1 Current GHGA Baseline

PE-ENV-01104 (TII, 2022) states that a baseline climate scenario should identify, consistent with the study area for the proposed development, GHG emissions without the proposed development for both the current and future baseline.

Ireland declared a climate and biodiversity emergency in May 2019 and in November 2019 there was European Parliament approval of a resolution declaring a climate and environment emergency in Europe. This, in addition to Ireland's current failure to meet its EU binding targets under Regulation 2018/842 (European Union, 2018) results in changes in GHG emissions either beneficial or adverse being of more significance than previously considered prior to these declarations.

Data published in July 2025 (EPA, 2025b), indicates that Ireland exceeded, without the use of flexibilities, its 2024 annual limit set under EU's Effort Sharing Decision (ESD) (406/2009/EC) by 1.03 Mt CO_2e. However, the 2024 emissions represent the second consecutive year in which Ireland's emission were below (-4.2%) 1990 levels. ETS (Emissions Trading Scheme) emissions decreased (-1.1%) and ESR (Effort Sharing Regulation) emissions decreased (-2.2%). Ireland's target is an emission reduction of 626 kt of CO_2e by 2030 on an average baseline of 2016 to 2018.

The EPA estimate that 2024 total national GHG emissions, excluding LULUCF, have decreased by 2.0% on 2023 levels to 53.82 Mt CO_2e, with a 0.7 Mt CO_2e (-8.9%) reduction in electricity industries alone. This was driven by a 39.7% share of energy from renewables in 2024 and the complete phase-out of peat for electricity generation. Manufacturing combustion and industrial processes decreased by 4.6% to 6.0 Mt CO_2e in 2024 due to declines in fossil fuel usage. The sector with the highest emissions in 2024 was agriculture at 37.9% of the total, followed by transport at 20.8%. For 2024, total national emissions (including LULUCF) were 57.6 Mt CO_2e (EPA, 2025b) (Table 16-5).

The current estimates of national greenhouse gas emissions (including LULUCF) in 2024 are 12.0% below 2018, well off the National Climate ambition of a 51% reduction by 2030. The data indicate that from 2021- 2024 Ireland has used 79% (186 Mt CO_2e) of the 295 Mt CO_2e Carbon Budget for the five-year period 2021-2025. This leaves 21% of the budget available for 2025, requiring a substantial 17.5% annual emissions reduction for 2025 to stay within budget.

Table 16-5 Trends in total national GHG emissions in 2021-2024.

Sector Note 1	2021 Emissions (Mt CO_2e)	2022 Emissions (Mt CO_2e)	2023 Emissions (Mt CO_2e)	2024 Emissions (Mt CO_2e)	Total Budget (Mt CO_2e) (2021-2025)	% Budget 2021-2025 used	Annual change 2023 to 2024
Electricity	9.89	9.69	7.57	6.95	40	85.25%	-8.19%
Transport	11.09	11.76	11.8	11.65	54	85.74%	-1.27%
Buildings (Residential)	6.87	5.75	5.35	5.61	29	81.31%	4.86%
Buildings (Commercial and Public)	1.44	1.45	1.39	1.49	7	82.43%	7.19%
Industry	7.09	6.62	6.31	6.01	30	86.77%	-4.75%
Agriculture	21.94	21.78	20.72	20.41	106	80.05%	-1.50%
Other Note 2	1.86	1.93	1.81	1.63	9	80.33%	-9.94%
LULUCF	4.63	3.98	3.89	3.89	–	–	0
Total including LULUCF	**64.82**	**62.99**	**58.83**	**57.64**	**295**	**82.81%**	**-2.04%**

Note 1 Reproduced from latest emissions data on the EPA website (EPA, 2025b).

Note 2 Other includes Petroleum refining, F-Gases and Waste (emissions from solid waste disposal on land, solid waste treatment (composting and anaerobic digestion), wastewater treatment, waste incineration and open burning of waste).

16.6.2 Future GHGA Baseline

The future baseline with respect to the GHGA can be considered in relation to the future climate targets which the assessment results will be compared against. In line with TII (TII, 2022) and ISEP GHG guidance (ISEP, 2022) the future baseline is a trajectory towards net zero by 2050, *"whether it* [the project] *contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050"*.

The future baseline will be determined by Ireland meeting its targets set out in the CAP25, and future CAPs, alongside binding 2030 and net zero by 2050 EU targets. In order to meet the commitments under the Paris Agreement, the European Union (EU) enacted *'Regulation (EU) 2018/842 on binding annual GHG emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013'* (hereafter referred to as the Regulation) (European Union, 2018). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. The Regulation was amended in April 2023 and Ireland must now limit its greenhouse gas emissions by at least 42% by 2030. The ETS is an EU-wide scheme which regulates the GHG emissions of larger industrial emitters including electricity generation, cement manufacturing and heavy industry. The non-

ETS sector includes all domestic GHG emitters which do not fall under the ETS scheme and thus includes GHG emissions from transport, residential and commercial buildings and agriculture.

In May 2025, the EPA released the report *Ireland's Greenhouse Gas Emissions Projections 2024-2055* (EPA, 2025c), which includes total projected emissions and a breakdown of projected emissions per sector under the 'With Existing Measures' and 'With Additional Measures' scenarios. The EPA projections indicate that currently implemented measures (With Existing Measures) will achieve a reduction of 10% on 2005 levels by 2030, significantly short of the 42% reduction target. If measures in the higher ambition (With Additional Measures) scenario are implemented, EPA projections show that Ireland can achieve a reduction of 22% by 2030, still short of the 42% reduction target.

16.6.3 Current CCRA Baseline

The region of the proposed development has a temperate, oceanic climate, resulting in mild winters and relatively cooler summers when compared with continental Europe. This baseline data is derived from the European Centre for Medium-Range Weather Forecasts (ECMWF) ERA5 data reanalysis (ECMWF, 2023) which includes observed data from individual meteorological weather stations across Ireland from 1950-2023 such as that at Cork Airport. This data is reanalysed to model a complete picture of Irelands historical climate. This method has been chosen to ensure data can be analysed at the daily level and harmoniously compared with future scenarios. The baseline time-period referred to in this assessment was from 1991-2020 and is specific to the Cork.

Figure 16-1 below shows the climatology for the 30-year period from 1991 to 2020 indicating the wettest months are from October through to January with December (109mm) being the wettest on average. Late Spring and Summer are markedly drier compared to the wettest months with average monthly precipitation 85mm-78mm respectively. The driest month on average was June (78mm), with March and September also experiencing lower than average rainfall (~80mm). Ireland's and Cork's precipitation patterns are strongly influenced by its oceanic climate, with the wettest months typically coinciding with periods of frequent low-pressure Atlantic storm systems.

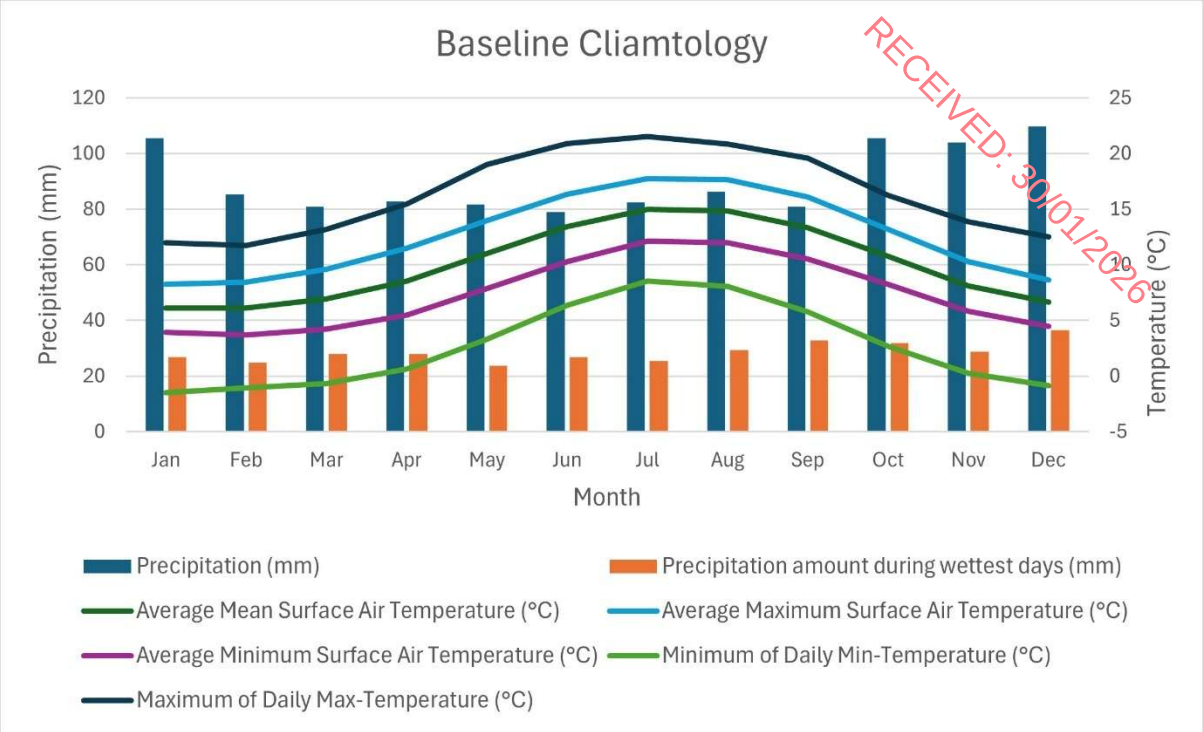

Figure 16-1 Baseline Climatology (Cork County) 1991-2020

July was the warmest month with a mean temperature of 14.9°C with average mean surface temperatures across the summer months (July – August) >17°C. July is also the warmest month for maximum daily temperatures (21°C) which showcases the higher value ranges recorded during a particular month. Across May – September average maximum daily temperatures exceed 19°C.

January and February are the coldest months with average mean surface air temperatures of 6.1°C and average minimum temperatures of 3.7-3.9°C. For daily minimum temperatures which reference the lowest range values (10th percentile range) of the data, January (-1.5°C) and February (-1.0°C) also remain the coldest with marginal difference. Several other winter and early spring months (November - March) also experience minimums of below 0°C.

Historical records show Cork has experienced several severe storms, with wind speeds exceeding 100 km/h, including a record set during Storm Éowyn in January 2025, which reached 142 km/h in Galway. Storm activity is concentrated in winter (December–February), with an average of eight named storms annually (Met Éireann, 2025).

Analysis of data from Cork Airport (1962–2020) indicates a mean 10m wind speed of 10 knots (18 km/hr) and maximum gusts ≥60 knots (111 km/h). High winds can also contribute to storm surge and coastal flooding; while Cork City and the wider region have experienced significant flood events, no coastal flooding has been recorded within the proposed site boundary during across the historical period (OPW, 2025).

Overall, the baseline climatology for the project site and region shows evidence of a high frequency of precipitation across the year with instances of very wet days (≥30mm) occurring across October and December. Winters are mild, with average minimums >0°C, and summers are

relatively mild, with average maximums of +17°C but no significant risk of extreme heat or prolonged drought.

16.6.4 Future CCRA Baseline

Climate Change Impacts and Projections for Ireland

Ireland is already experiencing increased annual rainfall in the north and west, with more variable patterns in the south and east including the area of the proposed development (EPA, 2021b). Key risks identified by the EPA relevant to the proposed project include:

- Increased likelihood of more frequent and intense North Atlantic low-pressure systems bringing high rainfall and high winds.
- More intense rainfall periods which may lead to pluvial flooding and elevated fluvial levels.
- Longer dry spells and increased temperatures will elevate the risk of wildfire.

Climate Modelling and Planning

International best practice and national policy such as the NCCRA (2024), Transport Infrastructure Ireland (TII, 2022) recommends using two emission scenarios to project future climate change. This includes a moderate and high emission scenarios (RCP4.5 and RCP8.5) for future planning. These Representative Concentration Pathways (RCPs) reflect varying levels of global climate mitigation explained below.

- RCP 4.5 (a 'moderate' scenario) represents an approximate 2.4°C increase in global average temperatures (1.7-3.2°C). It assumes moderate mitigation efforts leading to stabilisation of emissions by mid-century and is generally aligned with current policies for emission reduction.
- RCP 8.5 (a 'worst case' / high emissions scenario) represents an approximate 4.3°C increase in global average temperatures (3.2-5.4°C) and assumes continued high emissions with minimal mitigation. This high-end scenario is useful for understanding potential impacts of current emission trends continue. Consequently, this scenario will result in the highest level of physical risk for Ireland, and therefore the greatest requirement for adaptation.

This climate change assessment uses the latest climate change projections standardised and bias corrected for Ireland available through the EPA and the TRANSLATE project (EPA, 2025a).

16.6.4.1 Key Findings from Future Climate Projections

Projected changes include:

- Summer temperatures rising by over 2°C and overall mean temperatures increasing 0.7°C and 3°C by mid-century under RCP4.5 and RCP8.5 respectively.

- Summer rainfall decreasing while winter rainfall increasing sharply, attributing to an overall increase in rainfall annually for the site location.
- Fewer cold winter nights and more frequent short heatwaves (≥5 days >25°C).
- Increased likelihood of dry spells and drought which may elevate the risk of wildfire.
- Increased likelihood of more storms which may increase the risk of coastal flooding.

Table 16-6 Site specific – future climate change summary of projections under both RCP scenarios for 2050 period (2040-2070) taken from the EPA Climate Ireland Translate projections.

Climate Hazard	Indicator	Baseline	RCP4.5 (2040-2070)	RCP8.5 (2040-2070)
Temperature	*Mean temp (°C)*	10.0	11.5	12.1
	Mean Max temp (°C)	12.6	15.2	15.6
	Mean Min temp (°C)	7.4	8.2	8.6
	Average of Daily Max temp (°C)	21.5 (July)	27.4	28
Precipitation and Flooding	*Annual precipitation (mm)*	1084	1106 (+22)	1120 (+37)
	Max 1-day (mm)	36	47	47
Storms and high winds	*Number of Storms Qualitative (Description)*	On Average 8 named storms annually with speeds exceeding 100km/hr *(Note 1)*	Winter storm frequency is projected to increase, with a possible extension of the storm season. While the intensity of individual storms cannot be accurately projected, wind speeds are likely to remain above 100 km/hr.	
	Average Max Gust (Knots)	60		
Sea Level Rise & Coastal Flooding	*Qualitative (Descriptive)*	Reports of coastal flooding in surrounding areas but not at the site.	The OPW Coastal Flood Maps across the medium range future scenario, not flooding was modelled at the project site.	
Drought	*Absolute Drought (≥15 days with less than 1mm)*	Rare	Marginal increase	Increased Likelihood
Lightning	*Qualitative (Descriptive)*	Occurring during summer periods	This hazard may modestly increase in the future due to more favourable conditions, such as rising temperatures and extended warm periods beyond the traditional summer season	
Note 1 Data from combined Met Éireann, UK Met Office and Dutch Meteorological services.				

Impacts resulting from climate change hazards will evolve and have the potential to include increases in global temperatures and increases in the intensity and frequency of rainfall days per year combined with increases in the intensity and frequency of low-pressure systems in the north Atlantic during the winter storm period. Therefore, it is expected that the climate over the proposed site in Cork will evolve over time and consideration is needed with respect to this within the design of the proposed development.

16.7 Potential Impacts

16.7.1 Greenhouse Gas Assessment

There is the potential for greenhouse gas emissions to atmosphere during the construction and operational phases of the proposed development. As per the TII guidance (2022a), the significance of the effect of GHG emissions on climate is assessed for the total GHG emissions across all proposed development stages (section 0).

16.7.1.1 Construction Phase

The total GHG emissions arising from the construction and operation of the proposed development have been considered and are summarised in Table 16-7.

The embodied carbon within the construction materials has been calculated. This calculation was based on the TII Online Carbon Tool (TII, 2022b), and the quantities provided by the design team. Complete detailed information regarding the proposed construction materials and exact methodologies was not available at the time of this assessment and will be specified at the detailed design stage. Best estimates have been used in this assessment to provide an estimate of the GHGs associated with the proposed development.

The proposed development is estimated to result in total construction phase GHG emissions of 3,442 tonnes CO_2e for the material use and construction processes.

The assessment indicates that the key sources of GHG emissions are associated with construction phase is the embodied carbon from the materials used, accounting for 59% of emissions. Construction worker travel to site accounts for 32% of emissions

Table 16-7 Greenhouse gas assessment.

Source	Elements Considered	GHG Emissions (tCO_2e)	% Of Total	Relevant Sector
Materials	Aggregates and other fill material, plastic pipework and cabling, concrete, road pavement materials (e.g. asphalt), steel, geotextiles, timber	2,025	18%	Industry
Material Transport	HGV trips	279	2%	Transport
Excavation	Rock, topsoil and other excavation	8	0%	Industry
Construction Worker Travel to Site	Car, van and bus	1,101	10%	Transport
Construction water	Water used during construction	<0	0%	Industry
Construction Waste Disposal	Mixed C&D; concrete, bricks, tiles etc.; metals; aggregate waste	4	0%	Waste
Construction Waste Transport	Transport of waste offsite. Waste will be taken from the site by HGV.	25	0%	Transport

Source	Elements Considered	GHG Emissions (tCO_2e)	% Of Total	Relevant Sector
	Conservatively estimated that destination waste management facility will be 45 km from the site (90 km to and from the site).			
Total construction phase GHG emissions		3,442		
Operational energy	Natural gas and power used in CHP and other plant on site	7,798		Industry
Total operational phase GHG emissions		**7,798**		
Total construction and operational GHG emissions		**11,241**		

16.7.1.2 Operational Phase

The new CHP will be powered by natural gas which is a fossil fuel and releases GHG emissions when burned. Electrical power and gas usage by the other new plant, such as the RTO, cooling tower and WWTP equipment has been accounted for under operational energy.

The GHG emissions from the development as a total cannot be compared against one specific sector 2030 carbon budget. The emissions are broken down into different assessment categories and these must be compared separately to the relevant sectoral emissions budget. The predicted GHG emissions (as shown in Table 16-8) have been averaged over the full lifespan of the proposed development to give the predicted annual emissions to allow for direct comparison with national annual emissions and targets.

In Table 16-8, GHG emissions have been compared against the carbon budget for the industry, transport and waste sectors in 2030 (Government of Ireland, 2025), against Ireland's total GHG emissions in 2024, against Ireland's EU 2030 target of a 42% reduction in non-ETS sector emissions based on 2005 levels (27.7 Mt CO_2e) (set out in Regulation EU 2018/842 of the European Parliament and of the Council) and against Ireland's EU 2030 target of a 42% reduction in ETS sector emissions based on 2005 levels (12.9 Mt CO_2e) (Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading and amending Council Directive 96/61/EC (as amended)).

The estimated total GHG emissions, when annualised over the 50-year proposed development lifespan, are equivalent to 0.01% of Ireland's total GHG emissions in 2024 and 0.03% of Ireland's Non-ETS 2030 target. The total annualised industry-related emissions are 0.2% of Ireland's 2030 Industry budget. The estimated annualised GHG emissions associated with transport-related activities are 0.0005% of the 2030 Transport budget, while annualised waste GHG emissions are 0.00001% of the Waste budget.

Table 16-8 Estimated GHG emissions relative to sectoral budgets and GHG baseline.

Target/Sectoral Budget	(tCO_2e)	Annualised (50-year lifespan) Proposed Development GHG Emissions	% of Relevant Target/Budget
Ireland's 2024 Total GHG Emissions (existing baseline)	57,640,000	Total GHG Emissions	0.01%
Non-ETS 2030 Target	27,721,670	Total GHG Emissions	0.03%
2030 Sectoral Budget (Industry Sector)	4,000,000	Total Industry Emissions	0.2%
2030 Sectoral Budget (Transport Sector)	6,000,000	Total Transport Emissions	0.0005%
2030 Sectoral Budget (Waste Sector)	1,000,000	Total Waste Emissions	0.00001%

16.7.1.3 GHGA Significance of Effects

The TII guidance states that the following two factors should be considered when determining significance:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

The level of mitigation described in section 16.8 has therefore been taken into account when determining the significance of the proposed development's GHG emissions. According to the TII significance criteria described in Table 16-3, the significance of the GHG emissions during the construction and operational phase is ***minor adverse.***

In accordance with the EPA guidelines (EPA, 2022), the above significance equates to a significance of effect of GHG emissions during the construction and operational phase which is **direct, long-term, negative** and **slight**, which is overall **not significant.**

16.7.2 Climate Change Risk Assessment

16.7.2.1 Construction Phase

A detailed CCRA of the construction phase has been scoped out. However, consideration has been given to the proposed development's vulnerability to the following climate change hazards with best practice mitigation measures proposed in section 16.8.

- Flood Risk due to increased precipitation, and intense periods of rainfall. This includes fluvial and pluvial flooding.
- Increased temperatures potentially causing water scarcity and prolonged periods of hot weather
- Reduced temperatures resulting in ice or snow and [possible hazard to working conditions].
- Major Storm Damage, including wind damage and coastal flooding from storm surge.

- Wildfire resulting from dry spells and elevated temperatures.

16.7.2.2 *Operational Phase*

To determine the vulnerability of the proposed development to climate change the sensitivity and exposure of the development to various climate hazards must first be determined. Table 16-9 presents the initial qualitative climate hazards screening relevant to the proposed development due to the proposed development location and have been screened out of the assessment.

Table 16-9 Climate hazard screening.

Climate-related Hazard	Hazard Screening Rationale	Screening
Extreme Heat temperatures	High temperatures are a key consideration for both construction and long-term operation of the proposed project. Historical data shows rising temperatures in Ireland. Heat and thermal expansion can damage buildings, materials, and road surfaces, and affect the lifecycle of assets.	Screen in
Extreme Cold Temperature	Snow and ice events pose significant risks to health, safety, and site operations. Road access may be disrupted, and low temperatures can affect assets such as fuel tankers, workers, and infrastructure. Freeze-thaw cycles may cause cracking in concrete and road surfaces, requiring snow clearance and ice management.	Screen in
High precipitation and pluvial flooding	Surface water remains a key vulnerability for any proposed development during both construction, and operational phases due to the sensitivity of construction materials, site access, and site assets to water exposure.	Screen in
Fluvial flooding	The project site is elevated and close to a major fluvial waterway and estuary.	Screen in
Drought	Droughts have occurred across Ireland, previously impacting water supply. Future reductions in availability would directly impact the development and its operation.	Screen in
Wildfire	The area surrounding the site is largely urban and wildfire is not considered a risk to screen in for this development.	Screen out
High winds and storms	While the site itself isn't significantly elevated, existing and proposed assets and design components may be exposed to high winds. Historically, Ireland has experienced several notable storm events including Storm Éowyn and Storm Darragh (2024), which caused widespread damage across Ireland. These storms often bring heavy rainfall and flood warnings, increasing overall risk.	Screen in
Fog	Fog is not considered a significant hazard for this development, as it does not involve transport, aviation, or activities requiring high visibility.	Screen out
Lightning	The proposed design is not significantly elevated, and no extra risk is considered above what already exist under the existing design of the site and buildings.	Screen out

Climate-related Hazard	Hazard Screening Rationale	Screening
Landslides and Subsidence	The Geological Society of Ireland (GSI) landslide susceptibility mapping database (GSI, 2025) was reviewed to determine the low risk from landslides at the proposed development location. Consideration has been given to subsidence and adequate engineering measures are in place to ensure stability.	Screen out
Sea level rise and coastal flooding	The location of the development is close to the coast. A review of the OPW Coastal flooding forecast for medium range and long range shows no risk of flooding.	Screen out

16.7.2.3 Climate Vulnerability Assessment

The sensitivity and exposure of the development to the screened in climate hazards must first be determined to then determine the vulnerability of the proposed development to climate change. Flooding (pluvial), extreme heat, extreme cold, wildfire, and extreme wind, have been considered as climate hazards in the context of the proposed development.

The sensitivity of the proposed development to the climate hazards is assessed irrespective of the project location. Table 16-10 details the sensitivity of the proposed development on a scale of high (3), medium (2) and low (1). Once the sensitivity has been determined, the exposure of the proposed development to each of the climate hazards is determined, this reflects on the possible likelihood of the climate hazard occurring at the project location and is also scored on a scale of high (3), medium (2) and low (1). The product of the sensitivity and exposure is then used to determine the overall vulnerability of the proposed development to each of the climate hazards. The results of the vulnerability assessment are detailed in Table 16-10.

Table 16-10 Climate change vulnerability assessment.

Climate Hazard	Sensitivity	Exposure	Vulnerability
Flooding (Pluvial & Fluvial)	1 (Low)	2 (Medium)	2 (Low)
Extreme Heat	1 (Low)	2 (Medium)	2 (Low)
Extreme Cold	1 (Low)	1 (Low)	1 (Low)
Drought	2 (Medium)	1 (Low)	1 (Low)
Extreme Wind	1 (Low)	2 (Medium)	2 (Low)

The sensitivity and exposure of the area was determined with reference to several online tools and with input from the various discipline specialists on the project team. It was concluded that the proposed development does not have any significant vulnerabilities to the identified climate hazards as described in the below sections. All vulnerabilities are classified as low.

Flooding

Future increases in rainfall due to climate change may elevate the risk of pluvial flooding, fluvial flooding remains unlikely due to the locations raised elevation. A desktop assessment of flooding at the proposed project site shows no historical reference for flooding and a review of OPWs

Flood info (OPW, 2025) mapping shows the proposed site to be within an area not prone to flooding or future flood levels beyond extreme (1/1000-year events) indicating a low risk of flooding and within Flood Zone C. The low vulnerability of flood did not require an updated Flood risk assessment to be carried out for the proposed development.

As part of the site's existing flood risk management strategy, the stormwater drainage system will comply with all relevant standards and be designed to accommodate projected climate-related increases in rainfall matching OPW standards of 20% increase. The system will incorporate additional flood projection and combine with existing green infrastructure to manage runoff flow rates and reduce the risk of standing surface water on-site and contamination into the surrounding environment and watercourses.

Extreme Temperatures (Heat & Cold)

Both extreme heat and extreme cold have the potential to affect building materials and associated infrastructure. To mitigate this, materials will be selected in accordance with relevant design standards and tailored to withstand the range of temperatures typically experienced in Ireland. Future projections indicate a decrease in the likelihood of extreme cold events, reducing overall exposure and risk.

Consequently, extreme temperatures (both heat and cold) are not considered a significant risk. Nonetheless, resilience measures have been integrated into the design of cladding and structural elements to minimise deterioration and damage. High-quality materials and advanced cladding systems are proposed to ensure weather resistance, durability and long-term performance.

Drought

Future projections for climate show elevated temperatures and increased likelihood of dry spells but not significant drought conditions. The development does require water in its operations and measures have been taken to ensure water scarcity do not impede operations with efficient water use systems in place across the site.

Extreme Wind

In relation to extreme winds, the buildings shall be designed to the appropriate standards to account for the relevant wind loadings events for RCP4.5 and RCP8.5. If required as part of the building design, lightning protection shall be provided but this assessment concludes that lightning is not considered a risk to the site.

Summary

Overall, the proposed development has at most low vulnerabilities to the identified climate hazards. Therefore, no detailed risk assessment is required.

16.7.2.4 CCRA Significance of Effects

With design mitigation in place, there are no significant risks to the proposed development as a result of climate change. In accordance with the EPA Guidelines (EPA, 2022), the significance of effect of the impacts to the proposed development as a result of climate change are **direct, long-term, negative** and **not significant** which is overall **not significant** in EIA terms.

16.7.3 Cumulative

With respect to the requirement for a cumulative assessment the ISEP (ISEP, 2022) and TII (TII, 2022) guidance on which the assessment is based states that:

"*the identified receptor for the GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable. By presenting the GHG impact of a project in the context of its alignment to Ireland's trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland's ability to meet its national carbon reduction target. This assessment approach is considered to be inherently cumulative*".

As per the above, the cumulative impact of the proposed development in relation to GHG emissions is considered ***direct, long-term, negative*** and ***slight***, which is overall ***not significant*** in EIA terms.

16.8 Mitigation Measures

16.8.1 Construction Phase

Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase.

Best practice measures to reduce the embodied carbon of the construction works include:

- Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled;
- Materials will be reused on site where possible;
- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods;
- Ensure all plant and machinery are well maintained and inspected regularly;
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site; and
- Sourcing materials locally where possible to reduce transport related CO_2 emissions.

In terms of impact on the proposed development due to climate change, during construction the Contractor will be required to mitigate against the effects of extreme rainfall/flooding through site risk assessments and method statements.

The Contractor will also be required to mitigate against the effects of extreme wind/storms, temperature extremes through site risk assessments and method statements. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction. During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements.

16.8.2 Operational Phase

Mitigation measures include designing stormwater systems to OPW standards with a 20% rainfall allowance and integrating green infrastructure; selecting high-performance materials and cladding for temperature resilience and considerations for wind and storms; implementing efficient water-use systems to address dry spells; and ensuring structural design meets wind-loading requirements under future climate scenarios. These measures have been considered when assessing the vulnerability of the proposed development to climate change (see section 0).

No additional specific mitigation measures in relation to climate have been identified for the operational phase.

16.9 Monitoring Requirements

16.9.1 Construction Phase

There is no proposed monitoring during the construction phase.

16.9.2 Operational Phase

There is no proposed monitoring during the operational phase.

16.10 Residual Effects

The impact to climate as a result of a proposed development must be assessed as a whole for all phases. The proposed development will result in some impacts to climate through the release of GHGs. TII reference the ISEP GHG Guidance which states that the crux of assessing significance is "*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*". The proposed development has proposed some best practice mitigation measures and is committing to reducing climate impacts where feasible.

As per the assessment criteria in Table 16-3, the residual impact of the proposed development in relation to GHG emissions is considered ***direct, long-term, negative*** and ***slight***, which is overall ***not significant*** in EIA terms.

In relation to climate change vulnerability, it has been assessed that there are no significant risks to the proposed development as a result of climate change. The residual effect of climate change on the proposed development is considered ***direct, long-term, negative*** and ***not significant***.

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17.0 MAJOR ACCIDENTS AND HAZARDS

17.1 Introduction

This chapter of the EIAR describes the assessment undertaken of the potential individual and societal risk presented by the proposed development at the Cara Partners Little Island site. It also describes other events (natural and other external) that could contribute to (cause or exacerbate) a major accident at the proposed development site, as well as the potential for a major accident at the proposed development site to impact on the surrounding environs.

This Chapter has been prepared by Sustech.

17.2 Context

17.2.1 Guidelines for Environmental Impact Assessment

17.2.1.1 European Commission

Section 1.3.3 of the European Commission's *Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report* (2017) identifies two key considerations arising from Annex IV of Directive 2014/52/EU:

- the Project's potential to cause accidents and/or disasters, and
- the vulnerability of the project to potential disaster/accident.

The guidance notes that relevant information on these topics may be available from risk assessments pursuant to other EU legislation, such as the COMAH legislation on the control of major accident hazards involving dangerous substances.

17.2.1.2 Department of Housing, Planning and Local Government

Parts 4.28 to 4.30 of the Department of Housing, Planning and Local Government's *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment* (August 2018) requires that an EIAR include:

> *…the expected effects arising from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project. Where appropriate, the description of expected significant effects should include details of the preparedness for and proposed response to such emergencies*

The guidelines note that there are two key considerations, namely:

- The potential of the project to cause accidents and/or disasters, including implications for human health, cultural heritage, and the environment.

- The vulnerability of the project to potential disasters/accidents, including the risk to the project of both natural disasters (e.g. flooding) and man-made disasters (e.g. technological disasters).

The guidelines also note that these considerations are separate to any assessment of the project required under the COMAH Directive (and corresponding Irish legislation), which is likely to include a detailed risk assessment.

17.2.1.3 Environmental Protection Agency

The Environmental Protection Agency (EPA) has produced *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (May 2022). In the context of major accidents and disasters, Section 3.7.1 describes the requirements for the impact assessment, noting that the EIAR should contain:

> *A description of the likely significant effects of the project on the environment resulting from, inter alia:*
>
> > *d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);*
>
> *The description of the likely significant effects on the [environmental] factors should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project.*

17.3 Receiving Environment

17.3.1 Site Policies

Cara Partners currently have a number of policies in place with respect to managing health and safety onsite.

The Cara Partners Health & Safety Policy is attached in Appendix 17-A.

Under the Safety Policy, Cara Partners are committed to providing and maintaining safe and healthy working conditions, equipment, and systems of work for all employees.

Where appropriate, policies and procedures related to health and safety will be updated to account for the proposed development as the development progresses.

17.3.2 ISO 45001:2018

Cara Partners is certified to the ISO 45001:2018 standard. ISO 45001:2018 is the international standard for occupational health and safety (OH&S) management systems and is founded on the principle of proactively identifying, assessing and controlling risks to workers and others who may be affected by site activities.

The standard adopts a structured, risk-based approach that integrates health and safety considerations into day-to-day management, decision-making and operational control. Central to ISO 45001 is the requirement for leadership commitment, worker consultation and participation, systematic hazard identification and the implementation of controls based on the hierarchy of risk control.

In the context of a manufacturing site, this ensures that potential major accident hazards—such as those associated with chemical handling, process operations, equipment use and abnormal operating conditions—are identified early and managed through robust procedures, training, and emergency preparedness arrangements.

Certification to ISO 45001:2018 provides assurance that the site operates a mature and continuously improving health and safety management system aligned with international best practice.

From an EIAR perspective, this demonstrates that occupational health and safety risks, including low-probability but high-consequence events, are managed in a systematic and auditable manner, reducing the likelihood of incidents that could endanger personnel, the public, or the environment. The standard also requires regular monitoring, incident investigation and management review, ensuring that lessons learned from near-misses or incidents are captured and embedded into future operations.

Overall, ISO 45001 certification supports a strong safety culture and contributes to the prevention and mitigation of major accidents, thereby strengthening the site's overall risk management framework and its commitment to protecting human health within and beyond the site boundary.

17.3.3 Industrial Emissions Licence

Complementing the ISO 45001 standard is the existing site Industrial Emissions Licence (IEL Reg. No. P0017-02) which imposes significant conditions with respect to the management of major accidents and hazards. In summary, these conditions include but are not limited to requiring:

- The appropriate management of the installation;
- The implementation of an environmental management system (EMS);
- The implementation and maintenance of multiple infrastructural controls to prevent and mitigate potential impacts on the environment (e.g. firewater retention, bunding, abatement systems etc.);
- The implementation and maintenance of a sampling and monitoring regime re. environmental emissions and conditions;
- The appropriate materials handling systems;
- The implementation of a number of procedures including those related to accident prevention and emergency response; and
- The implementation of emission limit values for a variety of environmental aspects including emission to atmosphere and sewer.

This IEL will be reviewed subject to the grant of planning permission.

17.3.4 Characteristics of the Existing Site

The existing Cara site is located within Cork city in the IDA Little Island Industrial Estate region. Co. Cork. The site is accessed via the R623 at the south of the site which is off the N25 road which runs from Cork City to Rosslare Harbour via Waterford.

The site is located to the east of Cork city and lies in close proximity to Lough Mahon which lies to the south of Little Island.

The existing c. 8.6 Ha site can be considered generally as comprising of industrial buildings including large factory buildings and associated hardstanding, ancillary facilities etc.

The site process generally comprises of solvent-based extraction of target compounds and employs c. 100 employees that operate 24/7 in shift cycles.

The surrounding environment generally comprises commercial, industrial and utility premises for a varying range of services including:

- Viatris Little Island carparking (to the west)
- Viatris Little Island (to the north)
- Pressure Hydraulics & Controls (to the northeast)
- Castleview 110 kV substation (to the east)
- Intelligent Security Solutions (to the east)
- EPark Little Island (data centre business park on former Mitsui Denman site to south)
- Dosco (to the south)
- BASF Ireland (to the southwest)

Wallingstown Castle (CO075-021 PS00491) is located c. 50m from the east boundary of the site.

There are no immediate adjoining neighbouring residential development with the nearest residential dwelling c. 300m to the east of the site situated within the St. Lappins Place.

Further details of the site are presented in Chapter 2 of this EIAR and within other relevant chapters.

17.3.5 Neighbouring Land Use and COMAH

The site itself is not an Establishment as defined under the Control of the Major Accidents Hazards (COMAH) Regulations 2015 (as amended), however a number of listed establishments are located in the vicinity as follows:

- Upper Tier Establishment
  - BASF Ireland (c. 200m to the southwest)
- Lower Tier Establishment
  - Viatris Little Island aka Upjohn Manufacturing Ireland (across the road to the north of the site)
  - Janssen Pharmaceuticals (c. 350m to the east)
  - BOC Gases (c. 500m to the southeast)

For Upper Tier Establishments, the operator is required to prepare and maintain a Safety Report that explicitly assesses potential off-site major accident scenarios, including effects on neighbouring industrial sites. This assessment must demonstrate that all necessary measures are in place to prevent major accidents and to limit their consequences for human health and the environment beyond the site boundary. Upper Tier operators are also obliged to cooperate with the competent authorities in the preparation of external emergency plans, which consider the protection of employees and occupants of nearby premises and to provide relevant safety information to those authorities to support land-use planning decisions.

For Lower Tier Establishments, obligations include the preparation of a Major Accident Prevention Policy (MAPP) and the implementation of a safety management system designed to control risks arising from dangerous substances. While a full safety report and external emergency plan are not required for lower-tier sites, the operator must still take account of potential off-site consequences and ensure that risks to neighbouring land uses are reduced to as low as reasonably practicable.

17.3.6 Geology, Hydrogeology and Surface Water

Further details on the characteristics of the underlying geological, hydrogeological and hydrological regimes are available in Chapter 08 – Water Quality and Aqueous Emissions and Chapter 09 – Soils, Geology and Hydrogeology.

17.3.7 Biodiversity

A detailed assessment on the impacts of the proposed development on flora, fauna and biodiversity is also presented in Chapter 10 – Biodiversity.

In the event of a release of environmentally hazardous materials, this could result in a release offsite. As such the controls at the site include the provision of secondary containment (bunding and firewater retention) to collect spills and upgrades to the drainage system to protect against an unbunded release of hazardous material finding its way to the receiving environment.

17.3.8 Protected Structures and Monuments

A detailed assessment on the impacts of the proposed development on protected structures and monuments is also presented in Chapter 14 – Archaeology and Cultural Heritage.

The Historic Environment Viewer lists (incorrectly) three monuments within the proposed development site, a horizontal water-mill (RMP No. CO075-052----), a graveyard (RMP No. CO075-020001-) and church (RMP No. CO075-020002-) listed in the Historic Environment Viewer SMR register, however one of these (horizontal water-mill (RMP No. CO075-052----), is incorrectly recorded as being within the site. It is clearly illustrated on the original Record of Monuments and Places (RMP) or the Sites and Monuments Record (SMR) hard-copy series of maps as being located to the southeast of the development site. Wallingstown church (CO075-02001-) and Graveyard (CO075-02002-) are located in a separately screened area within the southeast corner of the site and won't be impacted by the proposed development.

The Church and Graveyard (RMP CO075-020001-2: Protected Structure RPS 495) are located within the red line boundary as part of the proposed development, however no works are proposed to be carried out within or in proximity to the church & graveyard which will be preserved intact and subject to a graveyard management and landscaping plan.

17.4 Characteristics of the Proposed Development

17.4.1 General Characteristics of the Proposed Development

The proposed development comprises various elements to be developed on a phased basis over a period of ten years. A proposed site layout drawing is presented in Drg. Ref. 5340-PLA-XXX-DR-DJF-AR-0010.

1) **Unit 1 Production Building** – Construction of a replacement, multi-storey Unit 1 Production building approx. 34m L x 23m W x 26m H (approx. 3,000m2).

2) **In Process Tank Farm Bund** – Modifications to the existing 'In Process Tank Farm' bund and ancillary plant and services related to same including pipe racks.

3) **Laboratory Gas Bottle Store** – Construction of a new Laboratory Gas Bottle Store approx. 4m L x 2m W x 4m H and ancillary plant and services related to same including pipe racks.

4) **Regenerative Thermal Oxidiser** – Provision of a new Regenerative Thermal Oxidiser, associated exhaust stack (approx. 10mAGL) and ancillary plant and services related to same including pipe racks.

5) **Process Cooling** – Provision of 1no. process cooling tower (approx. 5mAGL) to be installed to provide additional cooling for manufacturing processes and ancillary plant and services related to same including pipe racks.

6) **Combined Heat and Power Plant and Heat Recovery System** – addition of a new natural-gas fired containerised combined heat and power (CHP) plant (approx. 6 MW_{TH} Total Rated Thermal Input) and associated containerised waste heat boiler system with exhaust stack approx. 13mAGL and ancillary plant, kiosks and services related to same including pipe racks.

7) **Ethanol Storage Tank** – addition of a new ethanol storage tank (2.4m diameter x 7m H) in existing solvent tank farm bund and ancillary plant and services related to same including pipe racks.

8) **Car Park** – extension to existing car park including associated lighting to provide a net increase of additional 67no. permanent car parking spaces.

9) **Wastewater Treatment Plant (WWTP) Control and Blower Building** - Single storey building associated with WWTP expansion, approx. 11m L x 10m W x 4m H (approx. 90m2); and ancillary plant and services related to same including pipe racks.

10) **WWTP Chemical storage tanks and bund** – new concrete base and bund (approx. 45m2) with tanks approx. 3.5m H and ancillary plant and services related to same including pipe racks.

11) **WWTP Inlet works** – new screens, tanks up to approx. 9m H and ancillary plant and services related to same including pipe racks

12) **WWTP Dissolved Air Flotation tank** – new tank approx. 5m L x 2m W x 4m H and ancillary plant and services related to same including pipe racks.

13) **Site Works** – All associated site services, site development works and landscaping to facilitate the proposed development.

17.4.2 Specific Characteristics of the Proposed Development

The key characteristics of the proposed development in the context of major accidents and hazards is related to the use, management and storage of bulk chemicals onsite.

Table 17-1 sets out the estimated annual usage of relevant chemicals at full production capacity of the proposed development.

Table 17-1 Estimated usage of bulk chemicals.

Material	**Est. Annual Usage (tonnes)**
Ethanol	220.5
Methanol	20
Butanol	148.8
Acetone	480
Methyl Ethyl Ketone	151.2
Heptane	180
Glycerol	68.7
Ammonium Sulphate	1,836

It is noted that these volumes may change over time and that other materials may be utilised onsite.

17.5 Natural Events

17.5.1 Introduction

As outlined in Section 17.1, there are risks other than from a COMAH establishment that may impact on Cara Partners, including natural events (such as earthquakes, lightning strikes, extreme weather events, etc.) and other external events (such as aircraft impacts) that may cause or exacerbate a major accident at the distillery. These events are outlined in the following subsections.

17.5.2 Earthquakes

The School of Cosmic Physics (part of the Dublin Institute for Advanced Studies – DIAS) operates the Irish National Seismic Network (INSN), which comprises a series of monitoring stations around the country. Figure 17-1 shows the location and magnitude of historic and recorded seismic events in Ireland since 1980. This shows that while there have been several recorded seismic events, they are all of low or very low magnitude (typically less than magnitude 1.9).

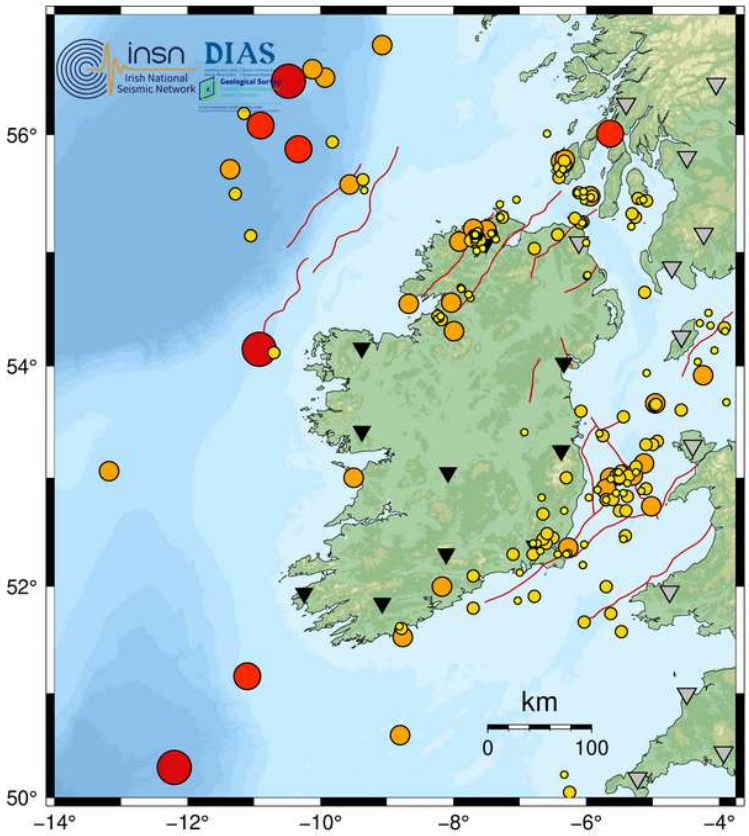

Figure 17-1 Historical and recorded seismic events since 1980.

The Seismic Hazard Harmonization in Europe (SHARE) project, comprising eighteen European partner institutions, has compiled two European Earthquake Catalogues, one for the period 1000 to 1899, and one for the period 1900 to 2006, which show the locations of seismic events across

Europe. The map for the period 1900 to 2006 is shown in Figure 17-2. It indicates that there is relatively little seismic activity in Ireland.

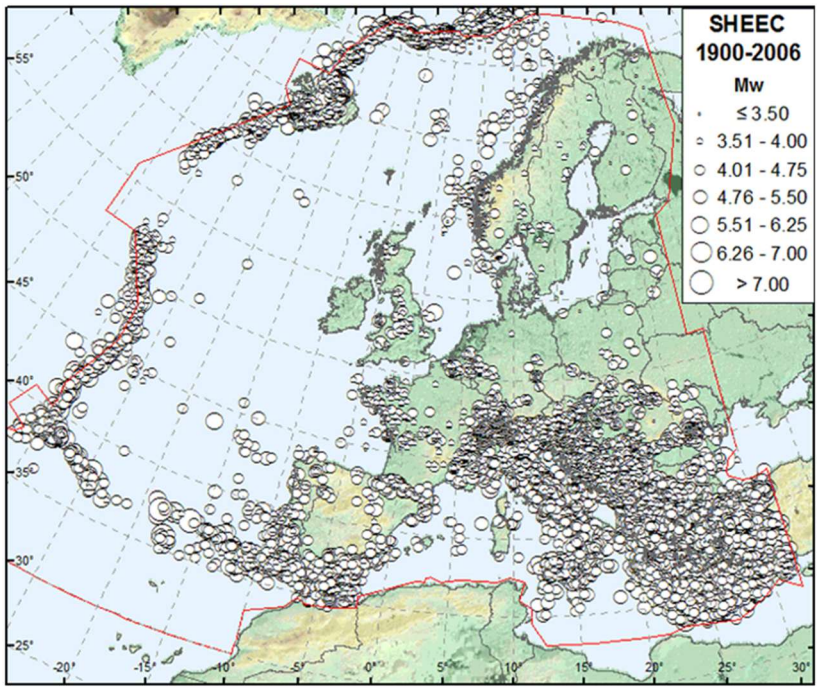

Figure 17-2 SHARE European earthquake catalogue (1900 to 2006).

The SHARE project has also developed a European Seismic Hazard Map, shown in Figure 17-3.

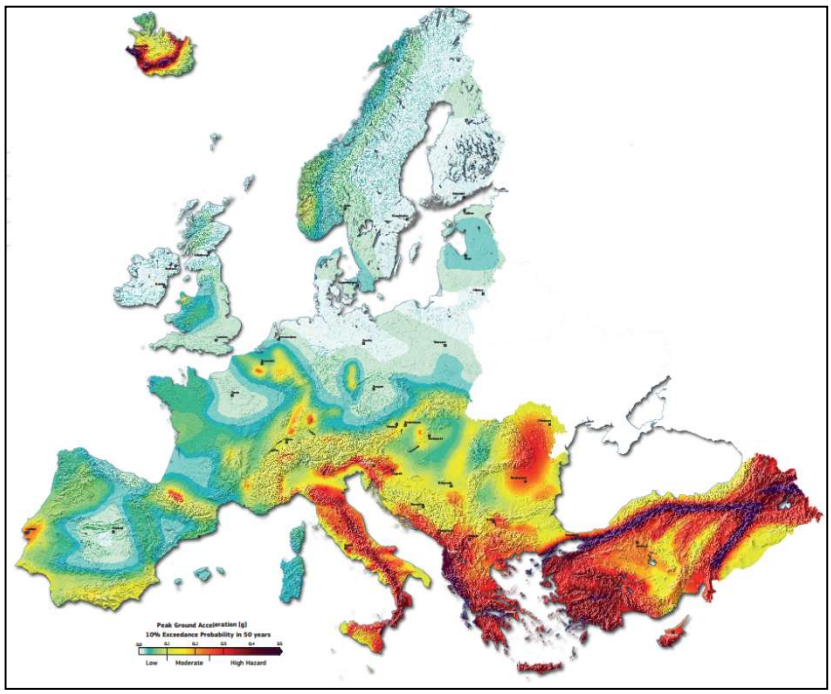

Figure 17-3 European seismic hazard map.

This shows the peak horizontal ground acceleration (measured in g – gravitational acceleration) predicted to be reached or exceeded with a 10% probability in 50 years. This corresponds to the

average recurrence of such ground motions every 475 years, as prescribed by the national building codes in Europe for standard buildings. Low hazard areas (PGA ≤ 0.1 g) are coloured in blue-green, moderate hazard areas in yellow-orange and high hazard areas (PGA > 0.25 g) in red. As can be seen from Figure 17-3, Ireland is a low hazard area.

There is no history of seismic activity in the vicinity of the site. There are no active volcanoes in Ireland so there is no risk of volcanic activity. Further detail is provided in Chapter 9 - Soils, Geology and Hydrogeology.

17.5.3 Lightning Strikes

The UK Met Office has operated a lightning location network since 1987 (in its current form known as ATDnet), which allows for the detection of lightning activity across Europe and in turn the development of maps showing the density of lightning strikes. A 2014 research paper[1] analysed the data from the network and produced the lightning flash density map shown in Figure 17-4. This shows that, in general, Ireland is an area of relatively low lightning activity, with the paper noting that:

> *Over the UK, Ireland and Scandinavia the densities are generally lower than the rest of Europe. Some of the lowest densities are observed over the Atlantic, North Sea and Baltic Sea.*

[1] G. Anderson & D Klugman, 2014, *A European lightning density analysis using 5 years of ATDnet data*.

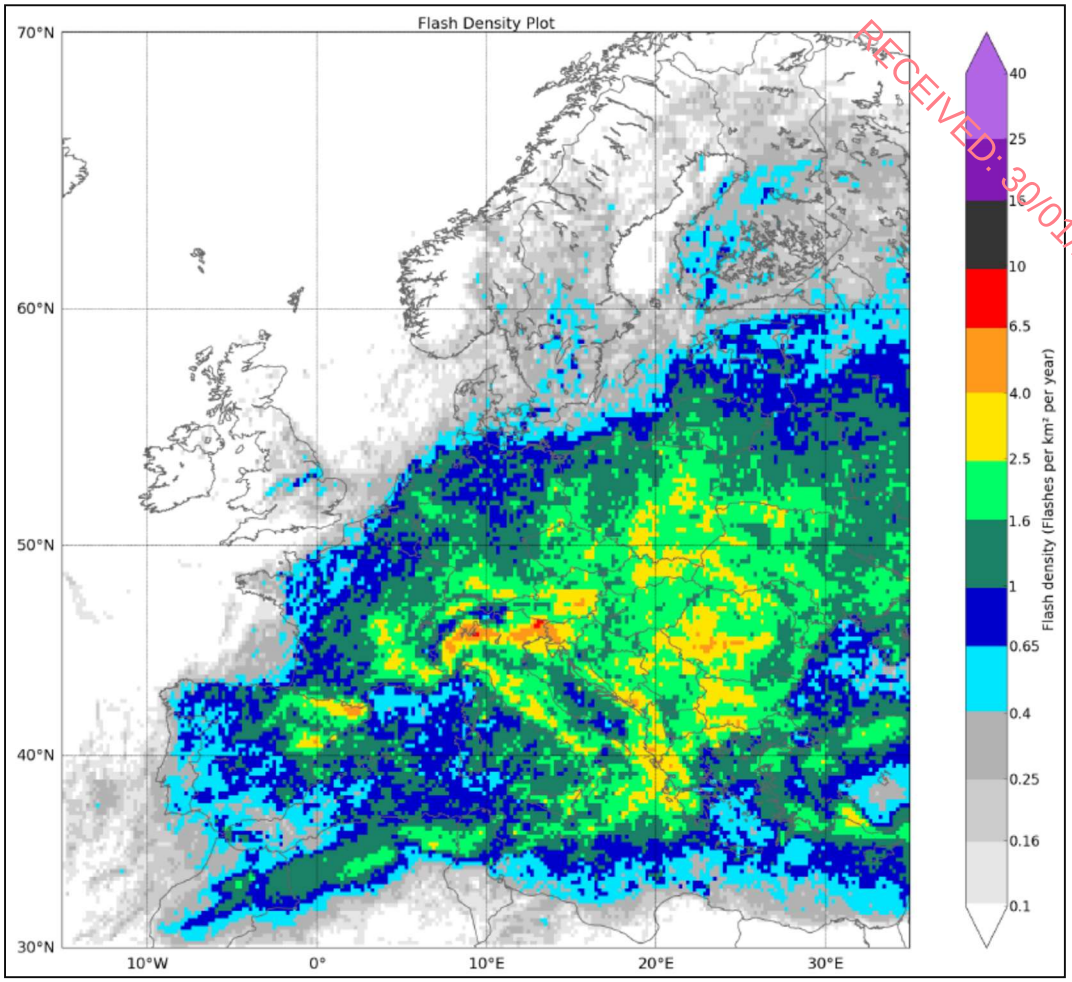

Figure 17-4 Annual detected lightning flash density (2008 – 2012).

The proposed design is not significantly elevated, and no extra risk is considered above what already exist under the existing design of the site and buildings.

17.5.4 Climate-Related Aspects

A climate change risk assessment including a climate vulnerability assessment related to the proposed development for the following aspects is provided in Chapter 16 – Climate:

- Extreme heat
- Extreme cold
- Precipitation and fluvial/pluvial flooding
- Drought
- High winds and storms

17.6 Major Accidents and Hazards

As noted previously the site is not a designated Establishment under the COMAH Regulations, however the site uses materials (Table 17-1) which could pose a risk to people and the environment in the event of a significant incident.

17.6.1 Construction Phase

During the construction phase, the potential for major accidents and hazards is considered to be low and is scoped out of further assessment.

Construction activities will comprise standard civil, structural, mechanical and electrical works using well-established construction techniques and equipment, consistent with those routinely employed on comparable industrial developments.

No unusual or inherently high-risk processes, quantities of hazardous substances or non-standard construction methodologies are proposed.

Potential risks during construction (e.g. vehicle movements, lifting operations, temporary works, fuel and material storage) are localised, short-term and well understood within the construction industry and will be effectively managed through the application of standard health and safety legislation, best practice construction management procedures and site-specific risk assessments and method statements.

Accordingly, the construction phase does not give rise to credible major accident scenarios with off-site consequences and its potential hazards are adequately addressed through normal construction safety controls.

17.6.2 Operational Phase

A number of potential major accident and hazard scenarios that could develop relating to site operations. These may happen in combination or separately. These include:

- **Pool fire**: in the event of a loss of primary containment, the released material forms a pool which could subsequently be ignited either within or outside of a bund.
- **Flash fire**: if the released material does not ignite in a pool fire, it may evaporate with the vapour dispersing to form a vapour cloud. If the area of the cloud in which the concentration of vapour is above the relevant lower flammable limit (the concentration at which the cloud could be ignited) ignites, it could give rise to a flash fire.
- **Vapour cloud explosion (VCE)**: this is also based on the dispersion of the flammable gas cloud, but rather than igniting as a flash fire, the cloud may be ignited giving rise to an explosion that propagates through the cloud.
- **Uncontrolled Chemical Release (unignited)**: an uncontrolled release of chemicals from primary containment.

- **Release of Contaminated Firewater**: there is potential for contaminated fire-fighting water run off to escape off site. Any release of this type could result in adverse environmental impacts.

17.7 Mitigation Measures

Given the nature of the existing development and extant regulatory requirements, there a significant number of mitigation measures in place with respect to Major Accidents and Hazards.

These include but are not limited to:

- **Fire Prevention and Detection**
  - There is a comprehensive site-wide fire detection and alarm system in place which incorporates smoke detectors, heat detectors, hydrogen and LEL detectors, UV flame detectors, sprinkler head activation and manual break-glass units.
  - Fire alarms are linked to defined **e**mergency response levels (Levels 1–3), ensuring proportionate escalation, internal response and notification of external emergency services where required.
  - Fire detection and alarm systems are designed to recognised standards (e.g. I.S. 3218) and are subject to routine testing and maintenance in accordance with insurance and manufacturer requirements.
- **Fire Suppression and Firefighting Infrastructure**
  - There are extensive automatic sprinkler systems installed across production, storage and warehouse areas, designed for defined fire durations and supplied by a dedicated firewater storage tank.
  - A dedicated firewater storage tank (c. 1,400 m^3) with diesel-driven fire pumps provides reliable firewater supply independent of mains supply.
  - On-site fire mains and hydrants are provided to support both internal firefighting and intervention by the Local Authority Fire Service.
  - Fire compartmentation and separation distances across the site limit fire escalation and mitigate domino effects between process, storage and warehouse areas.
- **Firewater and Pollution Control**
  - A dedicated firewater retention pond is provided to capture and contain firewater run-off during fire events, preventing uncontrolled discharge to receiving waters. This system can also operate to divert and retain major spills.
  - Automatic shut-off valves on the stormwater system are activated upon fire alarm activation or pollutant detection, ensuring immediate diversion of contaminated firewater to retention infrastructure.
  - Continuous online monitoring of stormwater quality (pH and TOC) with SCADA integration enables early detection of contamination and automated response.
  - Retained firewater will be managed through controlled treatment via the on-site wastewater treatment plant or off-site disposal, subject to agreement with the EPA and other regulatory stakeholders.

- **Secondary Containment and Spill Prevention**
  - Bunding and secondary containment are provided for tanks, drum stores and chemical storage areas to prevent loss of containment and migration of spills.
  - Bunds and containment structures are subject to routine inspection and integrity testing programmes in accordance with IEL requirements.
  - **L**eak detection and inspection regimes are in place for pipelines conveying solvents and process liquids, including solvent runs and regular visual inspections.
- **Emergency Response and Management**
  - A comprehensive Site Emergency Plan (Appendix 17-B) is implemented, defining roles, responsibilities, and response actions for fire, chemical release, and environmental incidents.
  - A trained Site Emergency Controller (SEC) and Emergency Response Team (ERT) are available to manage incidents, with defined interfaces to the Local Authority Fire Service (typical response time ~15 minutes).
  - Incident response arrangements include notification protocols for statutory authorities (EPA, HSA) and neighbouring receptors where off-site impacts may arise.
- **Road Transport Control**
  - All vehicles conveying dangerous substances by road are subject to the *European Agreement Concerning the International Carriage of Dangerous Goods by Road* (ADR). The ADR sets out the requirements for packing, loading, filling, transporting and unloading dangerous goods, and the requirements for the performance of the containers, the segregation/separation of incompatible materials, the separation of dangerous goods from other goods, and the actions to be taken in the event of an emergency.
  - Specialised vehicles that convey dangerous substances, must be certified for the transport of dangerous goods on an annual basis. Therefore, in addition to holding a Commercial Vehicle Road Test certificate (either as a heavy or light commercial vehicle), these vehicles must also hold an ADR vehicle certificate. Drivers of vehicles conveying dangerous goods must hold a valid ADR Training Certificate, which requires completion of an approved basic and/or tanker specialisation driver training course and successful completion of an exam, which, in Ireland, is managed by the Chartered Institute of Logistics.
- **Management Systems and Ongoing Process Control**
  - The site is certified to the ISO 45001:2018 standard.
  - Formal change management procedures are in place to ensure that any modifications to processes, storage arrangements, or infrastructure are assessed for major accident risk prior to implementation.
  - Where appropriate, relevant Hazardous Area Classification assessments related to ATEX zoning are completed.
  - There is an appropriate permitting system in place with respect to authorising activities that could be considered higher risk (e.g. ‘hot works’ etc.).
  - There are various SOPs in place for the appropriate and safe management of hazardous materials including a specific chemical spill control SOP.

- Appropriate training on relevant site polices and procedures is in place.

The proposed development will be fully integrated into the existing suite of major accident prevention and mitigation measures, plans and procedures in operation at the Cara Partners site.

All new buildings, plant, and process modifications will be designed to align with the site's established fire prevention, detection, and suppression systems, secondary containment arrangements, drainage and firewater management infrastructure and emergency response framework.

The development will be subject to the site's formal change management and risk assessment procedures to ensure that any new or modified hazards are identified, assessed and adequately controlled prior to commissioning.

Upon completion, the development will be incorporated into the Site Emergency Plan, Firewater Risk Assessment and relevant operational and maintenance regimes, ensuring continuity of control, regulatory compliance and consistency with existing major accident mitigation arrangements across the site.

17.8 Cumulative Impacts

The potential risks of cumulative impacts between the new and existing installations at the site and with neighbouring developments are managed through the use of mitigation measures to protect against these impacts, such as ensuring that that there are appropriate separation distances between installations, the installation of fire-rated walls and compartments on buildings, or the installation of fixed fire protection systems such as sprinklers. These risks are also mitigated through the implementation of emergency response measures.

17.9 Residual Impact

Having regard to the mitigation measures described above and their integration into the design, construction and operation of the proposed development, the residual impact associated with major accidents and hazards is assessed as not significant.

In accordance with the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2022), the assessment has considered both the potential of the project to give rise to accidents or disasters and the vulnerability of the project to such events.

The proposed development does not introduce novel or atypical hazards beyond those already present at the site and will be fully incorporated into existing, well-established accident prevention, control and emergency response systems operating under an Industrial Emissions Licence and an ISO 45001:2018 certified management framework.

Robust preventative and mitigation measures, which include fire prevention and suppression systems, secondary containment, firewater retention, controlled drainage, emergency planning and formal change management procedures, ensure that credible accident scenarios are of low likelihood and that consequences, should an incident occur, would be effectively contained within the site boundary.

On this basis, and taking account of the regulatory controls, monitoring and continuous improvement mechanisms in place, the residual risk to human health, the environment and surrounding land uses is considered to be low.

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Appendix 17-A

Cara Partners Health & Policy

Health & Safety Policy

Cara Partners is a pharmaceutical company involved in the manufacture of Ginkgo Biloba extract using natural and chemical ingredients. We are committed to providing a healthy and safe work environment and producing a safe product. The company recognizes its legal responsibilities and is committed to complying with all applicable regulations and legislation, including:

- Safety Health and Welfare at Work Act – 2005.
- Safety Health and Welfare at Work (General Application) Regulations 2007.

Cara Partners also acknowledges its other legal and moral obligations, including all corporate standards and guidelines, and is committed to ensuring the Safety, Health and Welfare of its employees while at work. In addition, the company has been assessed and certified as meeting the requirements of ISO 45001:2018 and is committed to maintaining this standard

The Company believes that Health & Safety is a value associated with its every priority and that tasks / operational activities can be executed without injury or loss. Chemicals and chemical related emergencies are specific hazards related to the company which must be effectively managed. Cara Partners is committed to preventing injury and ill health, and to continual improvement in its OH&S management and OH&S performance. Cara Partners consistently applies the hierarchy of control and the general principles of prevention to ensure that the most effective and collective safety measures are prioritized.

The Site Lead, through his management team will ensure:

- A safe working environment.
- That all operating exposures which may result in injuries are safeguarded.
- A competent workforce where safety is an integral part of their work and where each employee accepts responsibility for his/her own safety, health and welfare and that of any other person who may be affected by his/her acts or omissions while at work.
- A co-operative, participative and consultative approach to safety.
- The communication of this Policy to all persons working under the control of the company. This will be achieved through the induction process.

Achieving and maintaining our total safety culture is through a continuous improvement programme involving all employees in a team based approach with the company Environment, Health & Safety Manager as coach. This programme is based on annually formulated and reviewed OH&S objectives and targets.

The Site Lead will ensure a comprehensive Health & Safety audit is carried out annually, with appropriate remedial actions.

The safety statement will be revised as changes occur and periodically evaluated at set intervals. The safety statement will be communicated to all employees.

The board of directors are fully committed to this policy, and I accept that, the ultimate responsibility rests with me.

Signed: _____ **Date:** 23/04/24.

Michael Kirk
Site Lead

Appendix 17-B

Cara Partners Site Emergency Plan

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Cara Partners	Cara Partners - Emergency Plan - Little Island	Cara Code:	CP-SAF-002
Document Type: Standardarbeitsanweisung / Standard Operating Procedure		**Department:**	IRL_Health and Safety
		Revision:	1
		Enaio Code:	0000031121

CARA PARTNERS

CARA PARTNERS – LITTLE ISLAND, CORK.

SITE EMERGENCY PLAN.

List of Abbreviations.

BCCMT	Business Continuity and Crisis Management Team
BGU	Break Glass Unit
CP	Cara Partners
EC	Evacuation Coordinator
EMC	Emergency Management Coordinator
EMO	Emergency Management Organisation
ERT	Emergency Response Team
ERTL	Emergency Response Team Leader
FAT	First Aid Team
Hazmat	Hazardous Material
PES	Principal Emergency Services (Fire, Ambulance, Gardai)
PPE	Personal Protective Equipment
SEC	Site Emergency Controller

Contents

1. Introduction.

Cara Partners Little Island site is a bulk pharmaceutical manufacturing facility, located East of Cork city adjacent to the N25 and near to the M8 and Jack Lynch tunnel. The site is located in an industrial estate and has a number of neighboring sites that are operational industrial facilities.
The site is currently operating on 24/7 shift pattern with 4 shifts, and is moving toward a 24/5 production pattern with 3 shifts.

The site is Industrial Emissions(IE) licensed, operates an effluent treatment plant and is certified under ISO 14001 (Environmental) and ISO 45001 (Health and Safety management). Five (5) solvents are used in the production process, four of which are delivered to site by road tanker and two by IBC (Heptane & Butanol). There are two 'in-process' tank farms located at production facilities 1 and 2, known as Unit 1 and Unit 2, as well as a fresh solvent tank farm and a drum store (with flammable material and hazardous waste).

Ammonia Sulphate is a by-product of the production process. This is sold on locally and is stored on site in two storage tanks between September and January.

Significant accident hazards on site include loss of containment of solvents, acids and alkalis, explosion and fire, and toxic fumes as a result of a hazmat spill or fire.

2. Scope and purpose.

The purpose of this plan is to set out the structures and arrangements in place in Cara Partners for responding to emergencies occurring on-site in Little Island. Any incidents occurring elsewhere, E.G. in an off-site storage facility or involving transportation of material, will be managed by a separate team structure (outlined in the CP Business Continuity and Crisis Management Plan).

3. Objectives.

The objectives of this Emergency Plan are to

- Outline the site emergency organisation structure, including the key roles and responsibilities of those involved.
- To put in place emergency arrangements that will ensure the prevention or minimization of
    - Harm to colleagues, contractors and visitors to the site
    - Damage to the environment
    - Damage to property and other assets
    - Harmful or disruptive effects on neighbours and local community as a result of an on-site emergency.

4. On-Site Hazards.

A previous assessment of the significant accident hazards on-site was completed by Omega safety ltd in 2009. This identified and quantified potential emergencies on the basis of likelihood of occurrence and seriousness of the consequences. This identified fire, spillage of hazmat, creation of a potentially explosive atmosphere (including dust explosion) and toxic fumes as a result of a hazmat fire or spill as the major site hazards.

This plan adopts an all-hazard approach to on-site emergencies in Cara Partners, Little Island. i.e. the structures outlined in this plan will be leveraged in response to any emergency situation arising.

5. Definition and Categories of Emergency.

For the purpose of this plan, an emergency is defined as any situation arising as result of Cara partners operations that causes or threatens

- Harm to people
- Contamination of the environment
- Damage to property or assets of Cara Partners, or
- Causes significant disruption to neighbouring businesses or the local community.

There are three levels of emergencies that can arise on the Cara Partners site in Little Island:

5.1 **Level 1 Emergency**.

A level 1 emergency is a localised incident that can be managed by Cara Partners personnel at the incident site, possibly requiring the assistance from the ERT, e.g. small hazardous material spill.

5.2 **Level 2 Emergency**.

A level 2 emergency is any incident on-site that requires the full activation of the Emergency Response Team and/or requires a response to site from one of the Principal Emergency Services (PES, Fire, Ambulance, and Gardai). E.g. small fire, medical emergency.

5.3 **Level 3 Emergency**.

A level 3 emergency is any incident that requires the notification and activation of more than one PES (fire, ambulance and Gardai) in response to the incident/event. Such incidents will also require the activation of the Cara Partners Incident and Emergency Management structures and will usually require the evacuation of part or all of the premises. There may be an external impact from level 3 incidents, and neighbouring businesses and the general public may need to

be informed. Notification of statutory agencies (HSA, EPA) will more than likely be required at this level of incident, and there may be media coverage of the incident.

6. Emergency Management Organisation Structure.

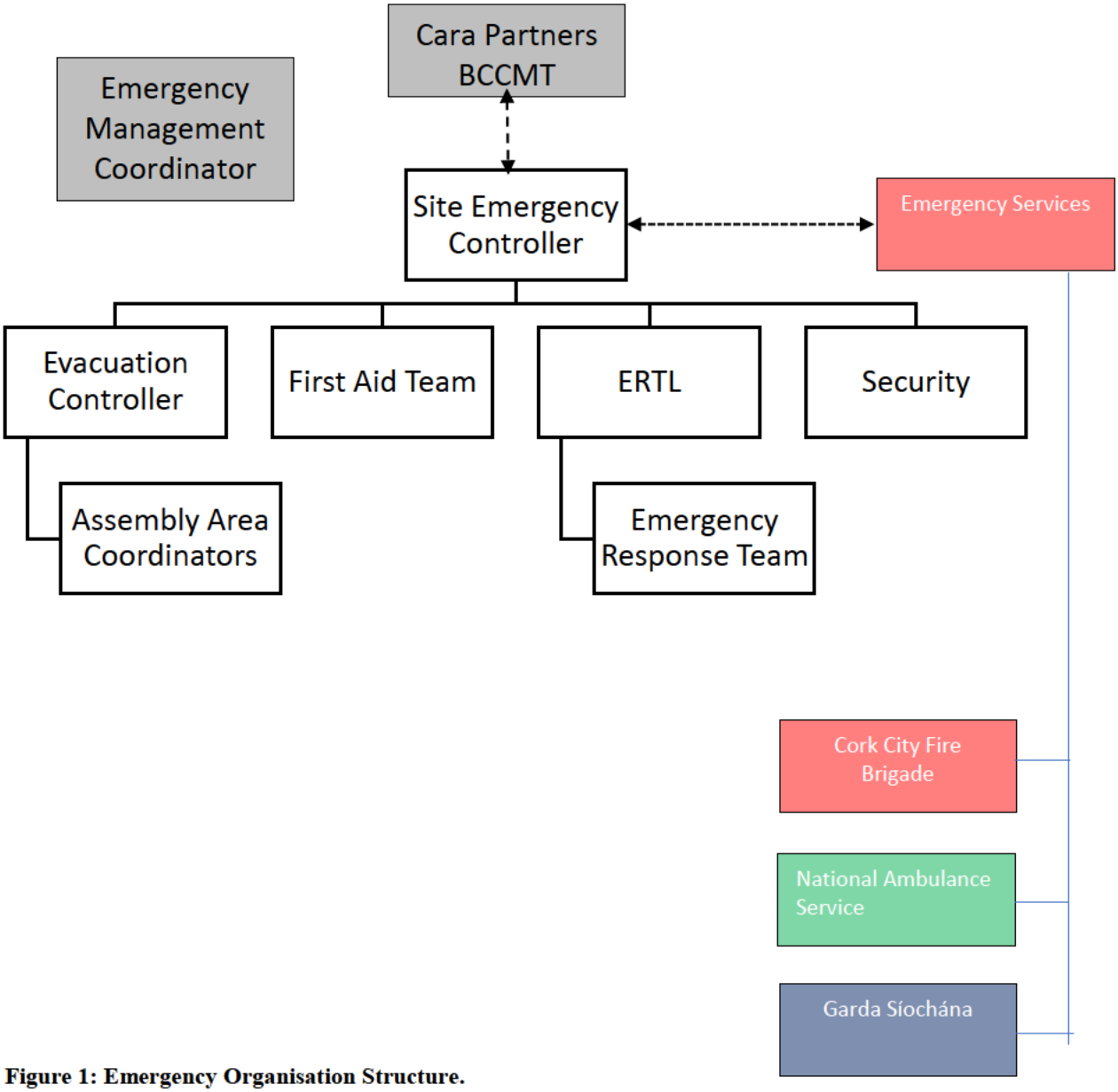

Figure 1: Emergency Organisation Structure.

Note: The level of the emergency will be determined by the SEC in consultation with the ERTL

6.1 Contact Details – EMO.

The names and contact details of designated SEC's are included at **Appendix 1-1**, along with the names and contact details of other personnel with designated roles in the EM Organisation structure. **Appendix 1-2** contains the contact numbers of emergency services and immediate neighbouring businesses.

6.2 ERT Capabilities.

The CP ERT will be the first responders to incidents occurring on-site when the site is operational. Outside of operational hours (weekends and planned shutdowns) the CP ERT capability is reduced and there is an increased dependency on the PES for emergency response. ERT members receive regular training based on a number of potential emergencies that could arise on-site. These in turn are based on the Major Accident Hazard assessment conducted by Omega, and include:

- Fire of a general nature
- Fire involving a solvent or oil
- Fire – LPG leak, e.g. pipeline
- Fire – dust, solids or powder
- Fire – electrical
- Fire – tank farm bund
- Fire – road tanker
- Fire – drum store
- Boiler house incident

An all-hazard approach to emergency management is adopted in CP, i.e. CP has identified and trained response teams who will act as first responders in multiple scenarios until the arrival of the PES.

6.3 ERT Organisation – Daytime, Shifts and Weekends.

Each shift has a designated Emergency Response Team, consisting of a nominated ERTL and team members (See Appendix 1). The shift ERT is the primary on-site unit for response to emergencies at levels 2 and 3.

During normal daytime operations there is a back-up ERT constituted of non-shift ERT members. This team acts in support of the primary ERT.

During weekends where the site is non-operational (i.e. when operating on a 24/5 shift pattern) the Security Officer is responsible for notifying the emergency services of any level 2 or level 3 incident. S/he will also contact and inform the On-Call Manager.

6.4 Annual Shutdown ERT.
Prior to the annual shutdown period the Asset Care team leader and the Health and Safety Officer will nominate an ERTL and team members to provide response capability during hours of operation. Those rostered during this period will be notified prior to the shutdown.

7. On-Site Emergency Response.

7.1 The site alarm system can be activated manually by Break Glass Unit, or automatically by heat and smoke detection sensors, and air analysers. When the alarm sounds, the Security Officer in reception will investigate and be in a position to brief the ERTL and the SEC on where the alarm has activated. Where two or more sensors have alarmed the emergency services will be called.

Note. The main alarm panel is located in the 'old Laboratory write-up area'. The panel is actually located in the press in hallway outside the laboratory, which was formerly a reception area. There is a mirror image panel located in the current Security Reception area, which is the de-facto main alarm panel on site and the one that will be investigated by the responders.

7.2 Raising the alarm.
Any person discovering an emergency situation should raise the alarm. For less serious (level 1) incidents e.g. minor spill or injury, the alarm should be raised by alerting the area supervisor, who will organise the appropriate response. Personnel should only attempt to deal with an incident if safe to do so or if trained in how to respond. Appropriate PPE must be worn before attempting to tackle any chemical spill, and there must be an appropriate number of such personnel for the incident. For more serious incidents (level 2 and 3) the site emergency alarm can be activated by breaking the nearest Break Glass Unit (BGU). There are also automatic smoke detectors and heat detectors connected to the central alarm system. The Security Officer at reception can activate the side-wide alarm manually when required.

7.3 A level 1 emergency will be managed and dealt with by personnel in the immediate area of the incident or by members of the site ERT. All such incidents must be reported to the designated ERTL either directly or through security. The ERTL will make contact with and brief the SEC at the earliest appropriate opportunity when the ERT is activated. For all level 2 and level 3 incidents the SEC must be contacted and updated by security and the ERTL.

7.4 On hearing the site alarm, all personnel should Make-safe the task at hand and proceed immediately to the designated assembly point in the car park.

7.5 On hearing the site alarm Visitors and contractors should immediately make their way to the visitor/contractor assembly area in the car park adjacent to the Security reception area. All visitors to site will be informed of the evacuation procedures when signing-in at Security reception. Visitors are the responsibility of the employee or contractor being visited, and should be accompanied at all times while on site.

7.6 For all incidents requiring the notification or activation of any emergency service, e.g. a medical emergency requiring an ambulance or a spill requiring the fire service both the ERTL and the SEC must be notified at the earliest opportunity. This can be achieved most effectively through Security. Security is responsible for calling emergency services by dialing 999/ 112

- On instruction from the SEC or ERTL
- When more than one alarm detector (fire, heat) activates
- When an initial assessment of the situation indicates that the services may be required

7.7 Making an Emergency Call – **ETHANE**.
When notifying the PES of an emergency, the following format should be used in order to ensure that essential information is passed to the services:

- **E**xact Location (CP address and Eircode)
- **T**ype of emergency (Chemical spill, fire, medical)
- **H**azards present (Chemicals, fuel, other)
- **A**ccess route to site
- **N**umber and type of casualties (if known)
- **E**mergency Services required.

A heat-sealed sheet with the ETHANE pneumonic should be kept at Security in a prominent position for emergency call purposes. See also **Appendix 3**.

7.8 For all level 3 incidents the site wide alarm will be sounded and the evacuation procedure will be followed. If the person raising the alarm has not sounded the site wide alarm the security officer will do so from security. On sounding of the site-wide alarm all personnel will proceed to the assembly areas in the car park unless directed elsewhere on instruction of the SEC or ERTL.

7.9 Assembly area coordinators will conduct a head count in their area of responsibility and report the evacuation status to the Evacuation Controller, who in turn will update the SEC, who will be located in the Security reception area.

7.10 Communications with external parties other than emergency services during an emergency is a matter for the Business Continuity and Crisis Management Team.

8. Transport Emergency Response -National or International

Any off-site incident involving a CP consignment of hazmat will be notified to the EHS (normal working hours) and the Shift Leader (after hours), who will ensure the SEC and BCCMT coordinator are notified.

The import of chemicals, solvents and the export of certain waste, is subject to the Carriage of Dangerous Goods by Road Regulations 2007. These impose duties on the

- Consignor
- Carrier and also the
- Driver of the vehicle carrying these goods.

The Regulations contain requirements for the vehicles, tanks, tank containers, receptacles and packages containing the dangerous goods during their carriage. They require that the drivers and others involved in the carriage of the dangerous goods by road are adequately trained and in the case of drivers, hold certificates of such training. The documentation contains the contact telephone number for the

- Consignor
- Carrier and
- Consignee

Consignor

The Consignor issues a certificate with a Transport Emergency Card. The Transport Emergency Card contains the following information:

- Name of substance
- Nature of danger
- Personal Protection
- General actions by the driver
- Additional and / or special actions by the driver
- Fire
- First Aid
- **Supplementary information for Emergency Services**
- Consignor's Emergency Telephone number

In the unlikely event that the Emergency Services contact site, following an incident with goods in transit consigned to site – during normal working hours EHS will be the point of contact; After hours the **Shift Team Leader** is the CP contact. The Shift Team Leader will respond accordingly supplying information from the relevant Material Safety Data sheet.

9.0 ERT Assembly and Response.

9.1 **Normal Operational Hours**.

On sounding of the alarm, the rostered ERT members will immediately make their way to the ERT Centre. A headcount of the rostered ERT will be conducted and the Evacuation coordinator notified by the ERTL.

The ERTL will go to security and get a briefing on the incident from the Security Officer, or witness to the incident. This brief should include

- Exact location of the incident
- Type of incident (fire, spill, explosion etc.)
- Hazards in the area (if known)
- Whether there are any casualties (if known)

The ERTL will then return to the ERT room to update the ERT and deploy as appropriate to the incident scene. The ERTL will keep the SEC updated on the situation by radio from the scene, and his single point of contact will be with the SEC.

9.2 **Outside Normal Operational Hours**.

When there is no designated SEC on site during an incident outside of normal operational hours (outside shift time or during planned shutdown) the ERTL is the senior member of the EMO. He will decide one of the following options:

- Remain at Security reception and act as SEC, whilst nominating the deputy ERTL to act as ERTL.
- Get the Security Officer to fill the key functions of the SEC until replaced by an on-call manager or another senior manager.

In the event that the ERT is under-staffed for any reason, the ERTL will decide on what response actions the ERT may take, or whether it is best to wait for the arrival of the PES. If waiting for the PES the ERTL should make his way to the Security Reception area and act as SEC in order to be in a position to brief the PES on arrival.

9.3 If for any reason there is no designated ERTL present, the senior member of the ERT will act as the ERTL. He will

- Go to the Security reception and don hi-viz jacket
- Access radio and establish communications with the ERT
- Appoint a supervisor or manager to conduct headcount at the assembly area
- Investigate the alarm in conjunction with the security officer
- Determine the requirement for emergency services, i.e. if more than one smoke detector or heat sensor has activated on the alarm, or a witness indicates a serious incident he will instruct the Security Officer to dial 999/112 and deliver an ETHANE message.
- Contact and brief the on-call manager, if not present on-site

- In the event that a missing person(s) is confirmed, he will assess whether the ERT resources are adequate to conduct a BA operation. He will instruct the ERT whether to operate under BA or to wait for the Fire Services and operate in support to them.

9.4 ERT operational procedures for specific scenarios are outlined in a separate ERT document 'ERT Emergency Response Procedures' CP-SAF-055, which gives guidance on potential emergency scenarios. The initial ERT response to alarm activations is outlined in **Appendix 2**.

9.5 Duties of the ERTL are listed at **Appendix 2-5**, and the general duties of the ERT members are listed in **Appendix 2-6.**

9.6 The SEC will appoint a traffic controller for all level 3 incidents. The duties of the traffic controller are outlined in **Appendix 2-7**.

10. Emergency Management Coordinator.

CP will appoint an Emergency Management Coordinator whose role is to administer the EM arrangements in CP. This role involves ongoing activities in preparation for emergencies that may arise, and specifically includes the following tasks:

- Ensuring familiarity with the EMP amongst all staff
- Arranging emergency training drills and exercises
- Updating the plan at least annually, and after training exercises (as appropriate)
- Liaising with 3rd party contractors, e.g. ERT training providers
- Assisting the SEC during emergencies
- Maintaining records of all emergency training, exercises and drills conducted
- Act as on-site point of contact for Emergency Services, outside of emergencies.
- Advising site leadership re structures and arrangements

11. Site Emergency Controller (SEC).

The SEC performs a critical role in the emergency response at CP. S/he is responsible for controlling all activity on site during the emergency, including liaison with the PES on arrival on site.

11.1 On sounding of the site wide alarm the SEC will immediately make his way to the Security reception area, don a hi-viz jacket identifying him/herself as the SEC and access a handheld radio (located in security for this purpose) for communications with the ERT.

11.2 The SEC will investigate the alarm panel and will be briefed by the Security Officer or witness to the incident. He will determine the category of the emergency, and will confirm that external PES have been notified and activated (using the ETHANE format) as required,.

11.3 He will make contact with the ERTL and brief him on the details of the incident as known at that point. (Note – the ERTL should make contact with the SEC by radio or present himself at Security for this briefing, depending on the circumstances).

11.4 He she will receive the evacuation/ headcount status from the Evacuation Coordinator, and will communicate same to the ERTL, when known. It is essential that any information relating to missing persons is passed to the ERTL as soon as available, as this may influence decisions taken by the ERTL in response.

11.5 The SEC will ensure that a log of actions and decisions is initiated and maintained throughout the incident.

11.6 The SEC is responsible for meeting and briefing the Emergency Services on arrival at the site. This briefing will take place in Security Reception, where an information pack with site maps, utility shut-offs etc. is available.

11.7 The SEC will ensure that the PES are made aware that the ERT is available to support them as required throughout the incident.

11.8 A checklist for the SEC initial actions is included at **Appendix 4**. This should be heat-sealed and readily accessible at Security Reception, similar to the ETHANE sheet.

12. Evacuation Coordinator.

The Evacuation Coordinator is responsible for establishing the evacuation status of the facility during emergencies. This is done by following the evacuation and headcount procedure outlined in **Appendix 5.**

The name of the EC on duty at any time should be clearly displayed on a notice-board in a prominent area (Reception), along with the names of the ERT, the SEC and the On-call manager.
Site Evacuation drills will be conducted annually with each shift, and a record of the drill maintained in the health and safety files.

The duties of the Assembly Area Coordinators are outlined in **Appendix 5-1**.

13. Security Officer.

The Security Officer on duty has a key role in the site emergency response, particularly in the initial stages and in scenarios outside of normal operating hours. His/ her duties include:

- Initial investigation of the alarm panel and manual activation of the site-wide alarm when required
- Briefing the SEC and/or ERTL on arrival in Security on the known situation
- Notifying the External Emergency Services when necessary or when instructed to do so by the SEC or ERTL, by using the ETHANE prompt sheet.
- Notifying the on-call manager outside normal operating hours and following instructions issued by him/her.
- Activating the BCCMT when instructed to do so by the On-Call manager.

- Contacting external parties when instructed by the SEC or ERTL, e.g. company doctor.
- Taking note of all incoming calls during an emergency and passing to the relevant CP management team members.
- Following the instructions of the ERTL in out of normal hours scenarios.

14. First Aid Team.

On hearing the site alarm the FAT should make-safe any task at hand and proceed immediately to their designated assembly area. Having accounted for themselves with the Assembly Area Coordinator, the FAT should gather in a designated location adjacent to the Security reception area, with their First Aid kits, and be prepared to deploy to the incident scene on instruction from the SEC.

It should be noted that the removal of casualties from the danger area **must be** performed by the ERT, with the FAT providing appropriate advice.

The FAT will determine whether further medical treatment is required and advise the SEC accordingly.

The FAT will brief paramedics on the casualty status when they arrive on the scene, and will ensure that the appropriate MSDS accompanies all casualties to hospital if exposure to chemicals is involved.

A number of first aid boxes are located throughout the site – see **Appendix 6-1**.

A list of trained First Aiders is included at **Appendix 6-2**.

15. Annual Training and Drills.

15.1 Annual evacuation drills for each shift are required by law. Fire drills are a legal requirement under the Fire Services Act 1981 - 2003 and Section 11 (Emergency Planning) of the Safety, Health and welfare at Work Act 2005. Fire and evacuation drills should be conducted annually, with each shift. To meet this requirement, the EM Coordinator will arrange for these drills to take place and will maintain a record of each drill.

15.2 The ERT is subject to a continuous training programme, facilitated by an external third party organisation.

15.3 The entire EMO (SEC, ERTL and ERT, FAT, Evacuation Coordinator, Assembly area coordinators) will participate in a site-wide evacuation drill at least annually.

15.4 Ideally, the annual training drill will be conducted in association with a Business Continuity and Crisis Management exercise.

Appendix 1-1: EM Organisation Contact Details.

SITE EMERGENCY CONTROLLERS		
Name	**Mobile**	**Office**
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

EVACUATION CONTROLLER		
Name	**Mobile**	**Office**
[redacted]	[redacted]	[redacted]
Nominated by shift lead (Nights)	[redacted]	

ERTLS		
Name	**Mobile**	**Office**
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

FIRST AID TEAM LEADERS		
Name	**Mobile**	**Office**
[redacted]	[redacted]	[redacted]

ASSEMBLY AREA COORDINATORS		
Name	**Mobile**	**Office**
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
Nights – designated by Evacuation Coordinator.	[redacted]	

Traffic Controller		
Name	**Mobile**	**Office**
[redacted]	[redacted]	[redacted]
OR Designate by SEC (days) Shift Lead nights)	[redacted]	

Note: Security manned 24/7. The security office will notify the emergency services of any level 2 or level 3 incidents by dialing 999/112.

Appendix 1-2 Emergency Service and Near Neighbour contacts

Emergency Services:

Gardai, Ambulance and Fire Brigade	999
Cork City Fire Brigade, Anglesea St.	4966333 (fax. 4310745)

Note: No direct lines available to Cobh and Midleton Fire Station.

Cork University Hospital	4922000
Company Doctor: EHA Block B, Heritage Business Park, Mahon Industrial Estate, Blackrock	4536000
Gardai - Anglesea St.	4522000
Gardai - Glanmire	4821002
Gardai - Mayfield	4558510
Gardai - Cobh	4908530

Neighbouring Companies:

UpJohn (Little Island)	[redacted]
Henkel Detergents (Punch Shoe Care)	[redacted]
BASF Ireland	[redacted]
Little Island Community Centre	[redacted]

Appendix 2: ERT Procedures.

2-1: ERT Strength Less Than 5 Members:

- ERTL go to Security and get a radio and fluorescent jacket
- Check radio for proper operation
- Appoint a person to carry out headcount.
- Ensure all personnel are accounted for
- Investigate alarm according to procedure for smoke/heat detector or detectors, break glass and sprinkler alarms as appropriate
- Call fire brigade immediately if any incident other than single smoke detector or Break Glass
- Contact manager on call for any alarm
- Respond to deal with incident with BA only as follows:
    - If there is a missing person
    - In support of the fire brigade
    - Only if the ERT numbers allow for safe BA operations.
- If communication is lost with investigation team and cannot be re-established wait for the arrival of the Fire Brigade.

2-2: Alarm Activation – 1 heat detector or smoke detector.

- Get location of alarm from Alarm Panel at Security
- Nominate a person to go to security by night
- Organise 2 persons to get BA and radios and proceed to investigate with PIC/ERTL
- Get call back on arrival at building and again before entry to activation room/area
- If fire / smoke is discovered withdraw immediately
- If the fire can be controlled with 1 extinguisher, withdraw, organise BA team to fight fire if safe to do so. Otherwise withdraw and await fire brigade
- Call Fire Brigade and await their arrival

2-3: Alarm Activation – Break Glass Unit.

- Get location of break glass unit from fire alarm panel
- Ensure you have working radio as you proceed to investigate
- Proceed as per smoke detector. Check with SEC re break glass operator before entering.
- Liaise with SEC to discover information from operator of break glass before entering area
    - Accidental: Stand down
    - Minor incident e.g. Small spill but no fire – Deal with using resources on site including BA if necessary
    - Fire or other serious incident – call Fire Brigade.
    - Use BA team to fight fire if fire can be controlled using 1 extinguisher
- Person who operated break glass not available
    - Investigate while proceeding with caution

2-4: Alarm Activation – 2 SD or Sprinkler Switch or CO2 System.

- Get location of device from alarm panel
- Call FB
- Get working radio and respond with 2 BA team (not under air) to investigate
- Call back at entry to building and entry to area of alarm to ensure SEC is aware of your location.

2-5: Duties of the ERTL

- On sounding of the alarm proceed immediately to the ERT Centre.
- Determine the nature and location of the alarm from the alarm print-out
- Turn on ERTL radio and conduct a communications check with SEC and EC
- Don fire-fighting kit.
- Perform 2 roll calls of ERT members and complete evacuation list (as per section 4.8). Confirm ERT Evacuation status to EC by radio.
- Go to the scene of the incident, and make contact with the SEC by radio.
- Assess the situation at the scene and respond as appropriate by instructing the ERT on the action to take.
- Update the SEC on ERT actions.
- Request through the SEC for First Aid personnel to attend scene if required –advise of route to be taken to incident scene.
- Ensure any event is tackled in a safe manner minimising the risk to any of the fire team.
- Send Valve /F.W.R.P / Fire pump man to pump house to check status of the fire pumps and to Unit 1 and Unit 2 sprinkler valve rooms to check status of valves.
- When the external fire crews arrive at the scene, liaise with the Station Officer as required.
- Follow the instructions of the SEC throughout the incident.
- Complete a written report of the incident as soon as practical on closure of the incident.

2-6: Duties of the ERT members.

- On sounding of the alarm, conduct a make-safe on the task in hand and proceed immediately to the ERT centre.
- Don appropriate fire-fighting kit (tunic, trousers, helmet, boots and gloves)
- Collect equipment – 4 B.A. sets, 1 control Branch, control board and pen.
- Collect radio if instructed to by ERTL – conduct communications check with SEC.
- Designate First Aid ERT member will collect the Trauma bag from the First Aid room
- Respond to the incident scene as instructed by ERTL.
- Approach scene from an upwind direction
- Await instructions from the ERTL to deal with the incident.
- NEVER attack a fire / spill without assessing the situation first.
- Use B.A. only on orders of the ERTL.
- If the ERT is under-strength, report situation to the SEC and await the arrival of the PES.

2-7: Duties of the designated Traffic Controller

- Ensure the barrier is in the “up” position.
- Ensure unhindered access to site for Emergency Services.
- Locate on the main road in hi-viz jacket and guide approaching PES vehicles to the security reception area
- Prevent unauthorised access to site of people/vehicles.
- Provide further information, directions etc. to responders as directed by Site Emergency Controller
- Follow the instructions of the SEC
- Remain in place controlling traffic until instructed otherwise by the SEC or PES.

Appendix 3: Calling Emergency Services.

When calling the emergency services the ETHANE format for passing relevant information to the services should be used. While anyone can call 999/112 to activate the PES, the Security Officer in reception may be instructed to do so by the SEC or ERTL. This procedure outlines how to make such a call.

Dial 999 or 112.

- Note that this call is answered by the Emergency Call Answering Service (ECAS), who will ask: "**Emergency Services – what service do you require"**

Caller states which service is required – for Cara Partners this will usually be the Fire Service, or the ambulance service in the event of a medical emergency.

The operator will patch you through to the Control Centre of the Service that you ask for. The call take will confirm the service, e.g. "Fire service, what is your emergency?"

Caller should now give **name and contact number**, and follow the ETHANE format, as follows:

- **E**xact Location:
  - 'I'M calling from Cara Partners Little Island, Cork, adjacent to UpJohn, DPD Depot and Little Island community center, Eircode T45 RK30.'

- **T**ype of Emergency:
  - There is a Fire / Chemical spill / toxic gas / explosion etc. on site.

- **H**azards present:
  - Flammable material – hazardous chemicals (state which) – noxious gas (state which if known) – Corrosive material (details if known)

- **A**ccess to site:
  - "there are two main access routes to the site:
    - The tunnel entrance to Little Island, turning left after Henkle, OR
    - Via the Eastern entrance turning right after the Community Center

    Drive to the main entrance opposite entrance to UpJohn – we'll have someone in hi-viz at the entrance to guide you to security.

- **N**umber and type of Casualties: (if known)

- **E**mergency Services present and those required
  - Note: when initial call is over you will be passed back to the ECAS operator – you must then ask for the next Emergency Service, e.g. Ambulance and repeat**.**

Appendix 4: SEC Checklist of Initial Actions.

- On arrival at Security Reception, don Hi-Viz SEC jacket
- Access the SEC hand-held radio and do a communications check with the ERTL
- Get a briefing from the Security Officer, or a witness to the incident if available.
- Investigate the alarm panel to determine the exact location of the incident.
- Determine the level of the incident and confirm requirement for external emergency services. If required, instruct the Security Officer to make the emergency call using the ETHANE format.
- Receive the evacuation/ headcount status from the Evacuation Coordinator and keep the ERTL informed.
- Silence the alarm once the headcount status is established.
- If the Assembly Areas are threatened or affected by the incident instruct the evacuation Coordinator to move to a safe area, e.g. move to canteen.
- Receive updates from the ERTL at the scene of the incident.
- Based on the situation, determine the requirement for the First Aid Team to deploy forward to the ERTL at the incident scene.
- Ensure a traffic controller is selected form assembled staff and deployed on the road at the main gate, in Hi-Viz, to guide the responding services to Security reception.
- Advise the BCCMT leader regarding the category of the incident and the evacuation status (BCCMT leader should be nearby and may look for update). In particular, if there is or is likely to be any off-site impact, advise the BCCMT leader immediately so that the BCCMT can be convened.
- Be prepared to meet and brief the Emergency Services on Arrival, using the information pack at Security Reception.
- Stand-down the emergency response aspect of the incident once the Emergency Services confirm that the incident is ended.
- Ensure that a log of the incident is maintained throughout the response.

Appendix 5: Evacuation and Headcount Procedure.

Establishing the safety of all personnel on site is the key priority during an emergency. The result of the headcount will have a direct influence on the decision making of the ERTL and of the PES when they arrive. This evacuation and headcount procedure must be followed every time the site alarm sounds and the premises is evacuated, even if it is a false alarm.

When the site alarm sounds the designated Evacuation Controller will:

- Immediately make his way to the Security Reception area, where he will don the EC hi-viz vest.
- Collect a handheld radio at security and do a communications check with the SEC/ ERT.
- Collect the personnel lists for each of the 5 designated assembly areas, and distribute them to the 5 Assembly Area Coordinators. The 5 designated assembly points are
    - Administration
    - Manufacturing
    - Laboratory
    - Engineering
    - Visitor and contractors

  The ERT will conduct a separate head count at the ERT center and report by radio to the EC.
- Confirm ERT headcount by Radio.
- Receive the completed headcount lists from each of the Assembly Area coordinators and immediately report the evacuation status to the SEC.
- For any unaccounted for personnel the EC will make enquiries amongst the evacuated staff in an effort to determine the last known whereabouts of the missing person(s) and will report this to the SEC.
- Ensure that none of the evacuated personnel re-enters the premises.
- Keep the evacuated staff and contractors in the assembly areas unless instructed otherwise by the SEC or emergency services.
- Keep a record of any personnel who leave the assembly area on request from the SEC.
- Continuously monitor the safety of the assembly area, and take appropriate action regarding the safety of the evacuated staff as required.

5-1: Duties of the Assembly Area Coordinators.

- On sounding of the site alarm proceed immediately to the assembly area in the car park adjacent to security reception area
- Seek out the Evacuation Coordinator and obtain the role-call sheet for the designated assemble area
- Conduct the roll call, ticking off the names of those physically present in the assembly area
- Confirm the roll call, particularly in relation to any unaccounted for personnel
- Report the evacuation status for the designated assembly area to the Evacuation Coordinator, handing over the completed head-count sheet
- Return to designated assembly area and monitor personnel in that area, passing on any instructions received from the EC.

Appendix 6-1: Location of First Aid boxes.

- Laboratories (2)
- Accounts Office
- Unit 1 Office
- Unit 1 Ground Floor
- Unit 2 Control Room
- Unit 2 Ground Floor
- Engineering Workshop
- Contractors Compound
- Leaf Preparation Area
- Unit 3
- Materials Office
- Waste Water Treatment Plant
- First Aid Room
- Boiler house

Appendix 6-2 Trained First Aid Personnel.

*****Contact numbers for First Aid personnel can be found at Security

Name
[redacted]
[redacted]
[redacted]
[redacted]
[redacted]
[redacted]
[redacted]
[redacted]
[redacted]
[redacted]

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18.0 INTERACTIONS AND CUMULATIVE IMPACTS

18.1 Introduction

This chapter has been prepared by Sustech. As a requirement of the European Communities (Environmental Impact Assessment) Amendment Regulations, 1999 (S.I No. 93 of 1999) and the revised EIA Directive (2014/52/EU), not only are the individual significant impacts required to be considered when assessing the impact of a development on the environment, but so must the inter-relationships between these factors be identified and assessed.

Similarly, consideration must also be given to the cumulative effects arising from the interaction of the project with impacts arising from current and known future developments in the area.

This chapter considers the impacts which occur as a result of cumulative or indirect impacts or through the interaction of impacts.

The examination of these impacts is important as an impact which directly affects one environmental medium may also have an indirect impact on other media (sometimes referred to as cross media impacts). This indirect effect can sometimes be more significant that the direct effect.

Cumulative impacts are impacts which occur as a result of incremental changes caused by other past, present or reasonably foreseeable actions together with this project.

Indirect impacts are impacts on the environment which are not a direct result of the project, produced some distance from the project or as a result of a complex pathway.

Impact inter-relationships or interactions are the reactions between impacts within a project and the inter-relationship between impacts identified under one environmental topic with impacts identified under another environmental topic.

18.2 Assessment Methodology

This chapter has been prepared as per the guidance documents outlined in Chapter 1 – Introduction.

The aspects of the environment likely to be significantly affected by the proposed development, during both the construction and operational phases, have been considered in detail in the relevant chapters of this EIAR. In order to demonstrate the areas in which significant interactions occur and to grade these interactions, a matrix has been prepared; this is presented as Table 18-1.

18.3 Receiving Environment

Chapter 4 – Planning and Development Context outlined the list of permissions in the vicinity of the proposed development. There have been no recent industrial, commercial or residential

planning applications in the vicinity of the proposed development that would be considered to have a significant interaction effect with the existing site or the proposed development.

18.4 Potential Impacts

Where any environmental element in the top row of the matrix (the receptor) is likely to be affected in any way by any element in the left-most column (the impactor), which contains the list of aspects of the environment likely to be significantly affected by the proposed development, the impact is described at the relevant intersection point on the matrix.

As demonstrated by the matrix, all interrelationships have been assessed as neutral as sufficient mitigation steps have been considered where any predicted impact has been identified. Such mitigation steps are outlined in their respective chapters.

Table 18-1 Interaction matrix of environmental disciplines and effect significance

Receptor / Impactor	Population and Human Health	Air Quality and Odour	Noise and Vibration	Water Quality and Aqueous Emissions	Soils, Geology and Hydrogeology	Biodiversity	Landscape and Visual Impact Assessment	Traffic and Transportation	Material Assets	Archaeological and Cultural Heritage	Waste Management	Climate	Major Accidents and Hazards
Population and Human Health		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Air Quality and Odour	Neu.; Imp.		Neu.	n/a	n/a	Neu.	n/a	n/a	n/a	n/a	n/a	Neu.; Imp.	n/a
Noise and Vibration	Neu.; Sli.	n/a		n/a	n/a	Neu.	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Water Quality and Aqueous Emissions	Neu.; Imp.	n/a	n/a		Neu.	Neu.; Imp.	n/a	n/a	n/a	n/a	n/a	n/a	Neu.
Soils, Geology and Hydrogeology	Neu; Imp	n/a	n/a	Neu.		Neu.	Neu.	n/a	n/a	n/a	Neu.; Sli.	n/a	n/a
Biodiversity	n/a	n/a	n/a	Neu.	Neu.		Neu.	n/a	n/a	n/a	n/a	n/a	n/a
Landscape and Visual Impact Assessment	Neu; Imp.	Neu.	n/a	n/a	Neu.	Pos..		n/a	n/a	Neu.	n/a	n/a	n/a
Traffic and Transportation	Neu.; Sli.	Neu.	n/a	n/a	Neu.	Neu.	Neu.		n/a	n/a	n/a	n/a	n/a
Material Assets	Neu.	n/a	n/a	Neu.	n/a	n/a	n/a	n/a		n/a	n/a	Neu.; Imp.	n/a
Archaeological and Cultural Heritage	Neu.	n/a	n/a	n/a	n/a	n/a	Neu.	n/a	n/a		n/a	n/a	n/a
Waste Management	Neu.	Neu.	n/a	Neu.	Neu.	n/a	n/a	Neu.	n/a	n/a		n/a	n/a
Climate	Neu.; Imp.	n/a	n/a	n/a	n/a	Neu.	n/a	n/a	n/a	n/a	n/a		Neu.
Major Accidents and Hazards	Neu.	Neu.	n/a	Neu.	Neu.	Neu.	n/a	n/a	n/a	Neu.	n/a	Neu.	

Table 18-2 Key for interaction matrix

Key	Impact	Definition
Neu.	Neutral	A change which does not affect the quality of the environment
Pos.	Positive	A change which improves the quality of the environment
Neg.	Negative	A change which reduces the quality of the environment
n/a	-	Not applicable
Key	**Significance**	**Definition**
Imp.	Imperceptible	Capable of measurement but without noticeable consequence
Not Sig.	Not Significant	Causes noticeable changes in the character of the environment but without significant consequences
Sli.	Slight	Causes noticeable changes in the character of the environment without affecting its sensitivity
Mod.	Moderate	Alters character of environment consistent with existing and emerging trends
Sig.	Significant	By its character, magnitude and duration or intensity alters a sensitive aspect of the environment
V. Sig.	Very Significant	By its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Prof.	Profound	Obliterates sensitive characteristics

18.5 Overall Impacts on the Human Environment

Impacts on the human environment, and particularly the people resident and working in proximity to the proposed facility, have been addressed throughout the EIAR. While Chapter 05 – Population and Human Health, deals specifically with the impacts on residential receptors, economic activity, health and safety, land use and local amenities, separate assessment has also been carried out on the other fundamental aspects that can affect people living and working in the vicinity of the site. Specifically, these aspects are: Air Quality; Climate; Noise and Vibration; Soils, Geology and Hydrogeology; Landscape and Visual Impact; Traffic and Transportation; and Water Quality and Aqueous Emissions. A detailed assessment of Major Accidents and Hazards related to offsite risks including societal risk is addressed in Chapter 17.

When all proposed mitigation measures are taken into consideration, the long-term impact of the project in the context of the Human Environment is expected to be positive. Significant socio-economic impacts associated with the project will outweigh the moderate and short-term negative impacts arising during the construction phase.

18.6 Cumulative Impacts

This section considers the cumulative impacts that the proposed development could cause through interaction with current developments in the area, as well as the construction and operation of future developments in the area.

No other proposed developments of significance in the area have been identified.

The relative impact of the proposed development is unlikely to have any significant cumulative impact with current development in the area.

18.7 Mitigation Measures

The foregoing chapters have identified mitigation measures relevant to the various assessment topics. The majority of potential impacts arising from the proposed expansion relate to the construction phase. Key to the successful management of all environmental mitigation measures identified is an overall plan, namely a Construction Environmental Management Plan (CEMP) to ensure all measures are implemented in a coordinated manner and no one measure is unduly prioritised over another. A CEMP has been prepared as part of this planning application.

Prior to the commencement of construction activities the CEMP will be updated for the proposed expansion to incorporate all mitigation measures identified within this EIAR and any subsequent planning requirements. A suitably qualified senior member of the Construction Management Team will be assigned responsibility for its execution, maintenance and on-going review. The appointed Principal Contractor and all sub-contractors will have important roles to ensure compliance with the CEMP.

The CEMP will include plans for dust, waste, water, traffic and noise management and set out the necessary measures to ensure protection of the environment during the construction phase.

The CEMP will be incorporated into the Construction Management Plan which will include detailed arrangements and plans for traffic and site logistics.

Communications will be maintained with Cork County Council through the construction phase of the development to ensure any new development proposals brought forward can be considered for potential cumulative impacts.

The CEMP will be maintained as a 'live' document which can respond to external influences outside of the control of the site construction management team.

Similarly, once the site becomes subject to an Integrated Pollution Control Licence, this will ensure mandatory control of emissions from the operational phase and will require the facility to be compliant with Best Available Techniques across the site.

18.8 Residual Impacts

The interactions between the environmental factors and impacts discussed in the EIAR have been assessed. All of the interactions identified are deemed neutral or not applicable. No negative impacts are expected to arise as a result of interactions between different environmental disciplines.