17 Cumulative Effects, Other Effects and Interactions

17.1 Introduction

This chapter presents an assessment of the cumulative effects, indirect effects, secondary effects, transboundary effects and the interaction/inter-relationship of effects between the various environmental factors as a result of the proposed development. This chapter also addresses other environmental effects which have not been specifically addressed in the individual chapters of the EIAR.

Only topics that could be logically linked to the development have been examined in detail. Accordingly, when a topic is not mentioned, the authors have concluded that no potential for significant effects exists.

17.2 General

The requirement to address cumulative effects, indirect effects and interactions of effects comes from the Planning and Development Acts 2001 to 2018, the Planning and Development Regulations 2001 to 2018 and the EIA Directive as amended by Directive 2014/52/EU. Section 171A of the Planning and Development Acts 2000 to 2018 and Schedule 6 of the Planning and Development Regulations 2001 to 2018 generally mirror the information provided in Directive 2014/52/EU on the information to be contained in an EIAR.

17.2.1 Cumulative Effects

Annex IV (5)(e) of the EIA Directive as amended by Directive 2014/52/EU requires that the EIAR shall contain:

"A description of the likely significant effects of the project on the environment resulting from, inter alia:

(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;

Furthermore, Annex IV (5) states that the EIAR shall contain:

*"The description of the likely significant effects on the factors specified in Article 3(1) should cover the direct effects and any indirect, secondary, **cumulative**, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project".*

Section 17.6 of this chapter presents an assessment of the cumulative effects of the proposed development with other projects.

17.2.2 Interactions and Inter-relationships

Article 3 (1) of the EIA Directive as amended by Directive 2014/52/EU requires that:

"*The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors: (a) population and human health; (b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC; (c) land, soil, water, air and climate; (d) material assets, cultural heritage and the landscape;* ***(e) the interaction between the factors referred to in points (a) to (d).***

The interaction of effects within the proposed development in respect of each of the environmental factors, listed in Article 3(1) of the EIA Directive and in the Planning and Development Regulations 2001 to 2018, have been identified and addressed in detail in the respective chapters in this EIAR. This chapter however, presents a summary of each assessment of the interaction (inter-relationship) of effects, from the proposed development, between the various environmental factors.

Section 17.4 of this chapter presents an assessment of the interaction/inter-relationship of effects between the various environmental factors as a result of the proposed development.

17.2.3 Do-Nothing Effects

A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge is provided in a number of chapters of the EIAR.

Each specialist assessment chapter (**Ch 6 – 16**) includes a detailed description of the baseline conditions with regard to the specific environmental aspect based on the best available environmental information and scientific knowledge. Each of these specialist assessments also includes an outline of the potential changes from the baseline scenario without the implementation of the project – in the assessment of the 'do-nothing' scenario and for example, in the description of future year traffic growth rates during construction (**Section 7.7.1** of the EIAR, **Chapter 7** ***Traffic and Transport***) and operation (**Section 7.7.13**). A summary of the "do-nothing scenario" for all of the specialist assessments is provided in **Section 17.8** below.

17.3 Methodology Used to Assess Cumulative and Indirect Effects and Interactions

17.3.1 Guidance

As described previously in **Section 17.2**, the requirement to address interactions of effects and cumulative effects are set out in the EIA Directive as amended by Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment.

This chapter has been prepared in accordance with the following guidance:

- Department of Housing, Planning and Local Government (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, August 2018.
- EPA (2017) Guidelines on the Information to be contained in Environmental Impact Assessment Reports, Draft, August 2017.
- European Commission (2017) Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report. (Office for Official Publications of the European Communities 2017).
- EPA (2015) Revised Guidelines on the Information to be contained in Environmental Impact Statements, Draft, 2015.
- EPA (2015) Advice Notes on Current Practice in the Preparation of Environmental Impact Statements, Draft, 2015.
- EPA (2003) Advice Notes on Current Practice in the Preparation of Environmental Impact Statements, 2003.
- EPA (2002) Guidelines on the Information to be contained in Environmental Impact Statements, 2002.
- European Commission (1999) Guidelines for the Assessment of Indirect and Cumulative Effects as well as Impact Interactions, (Office for Official Publications of the European Communities 1999).

17.3.2 Definitions

17.3.2.1 Cumulative Effects

The following definitions are generally used in the description of cumulative effects, indirect effects and interaction of effects.

The EC guidance (2017) uses the following definition for cumulative effects are defined as:

> *"Changes to the environment that are caused by activities/projects in combination with other activities/projects".*

EC guidance (2017) also states that:

> *"It is important to consider effects not in isolation, but together, that is cumulatively.* [….] *Cumulative effects are changes to the environment that are caused by an action in combination with other actions. They can arise from:*
>
> - *The interaction between all of the different projects in the same area;*
> - *The interaction between various impacts within a single Project (while not expressly required by the EIA Directive this has been clarified by the CJEU* [Court of Justice of the European Union] […]".

Under the EPA draft guidance (2017) cumulative effects are defined as:

> "*The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects".*

"Synergistic Effects – Where the resultant effect is of greater significance than the sum of its constituents".

The EC guidelines (1999) use slightly different definitions as follows:

"Cumulative Impacts: Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project".

17.3.2.2 Indirect Effects

The EPA draft guidance (2017) uses the following definitions:

"Indirect Effects (a.k.a Secondary Effects) – Impacts on the environment, which are not a direct result of the project, often produced away from the project site of because of a complex pathway".

The EC guidelines (1999) use slightly different definitions as follows:

"Indirect Effects: Effects on the environment, which are not a direct result of the project, often produced away from or as a result of a complex pathway (sometimes referred to as second or third level effects or secondary effects)".

17.3.2.3 Secondary Effects

The EPA draft guidelines (2017) describe indirect and secondary effects as interchangeable as shown above:

"Indirect Effects (a.k.a Secondary Effects) – Impacts on the environment, which are not a direct result of the project, often produced away from the project site of because of a complex pathway".

In this EIAR, secondary effects are described in the context of consequential development or projects that the proposed development may facilitate. Refer to **Section 17.5** below.

The EU EIAR guidance (2017), defines consequential development as:

"Consequential development is other Projects, not part of the main Project, stimulated to take place by implementation of the Project e.g. to provide new goods or services needed for the Project, to house new populations or businesses stimulated by the Project)."

17.3.2.4 Interaction of Effects

The EC guidelines (1999) use definitions as follows:

"Impact Interactions: The reactions between impacts whether between the impacts of just one project or between the impacts of other projects in the area".

The term *'impact interactions'* is equivalent to the term *'inter-relationship of effects'*. The EC guidelines (1999) accept that their definitions overlap to a certain extent. The EC guidelines also refer to '*Cross-Media Impacts'*, in which the

impact in one environmental medium may also have an indirect impact on another medium.

As shown in **Section 17.3.2.1**, the EU EIAR guidance (2017) refers to the interaction of effects in the context of cumulative effects where by:

"Cumulative effects are changes to the environment that are caused by an action in combination with other actions. They can arise from: […[T]he interaction between the various impacts within a single Project [….]."

17.3.3 Methodology

At the initial stage of preparing the EIAR for the proposed development, the potential for significant interactions of effects, indirect effects and cumulative effects were examined, and any potential effects were identified. These potential effects were included in the scope and addressed in the baseline and impact assessment studies for each of the relevant environmental factors and were also addressed in the design of the proposed development.

There were numerous discussions and communications between the environmental specialists and the design team throughout the design process which helped to identify and minimise the potential for significant interactions of effects, indirect effects and cumulative effects arising in the first instance.

17.3.3.1 Cumulative Effects

Similarly, cumulative effects arising from the interaction between the proposed development and other projects in respect of each of the environmental factors have been identified and addressed in detail in the respective chapters dealing with each environmental factor in this EIAR. This chapter however, presents a summary of these individual cumulative assessments with other projects and considers the cumulative effect of the entirety of the project as a whole with other projects. No additional mitigation measures are proposed in this chapter.

17.3.3.2 Indirect Effects

Each of the relevant assessment chapters has considered the indirect effects of the proposed development and described them where they have been identified as likely significant effects.

For example, in **Chapter 11 *Landscape and Visual Assessment***, indirect visual effects during construction may result from temporary or short-term changes in the intensity of use of public roads leading to the development site but this will be consistent with such use for other developments in the area and will not be significant. Indirect effects may also arise from the perception that the land use is changing or continuing to evolve as a living and working harbour as it responds to contemporary needs, but in any event will be consistent with such ongoing development and will not be significant.

17.3.3.3 Interaction of Effects

The interaction of effects within the design of the proposed development and the mitigation measures relative to those interactions in respect of each of the

environmental factors have been identified and addressed in detail in the respective chapters dealing with each environmental factor in this EIAR. Thus, no additional mitigation is proposed in this chapter. This chapter presents a summary of each assessment of the interaction (inter-relationship) of effects (from the proposed development) between the various environmental factors. Mitigation measures relative to those interactions are addressed in individual chapters.

The matrix and expert opinion approaches, as outlined in the EC Guidelines (2017), were used in the identification of the potential for significant interactions of effects. Refer to **Table 17.1** for the matrix of potential interactions. Modelling and carrying capacity analyses were used to evaluate interactive effects where appropriate in the respective chapters. For example, the interactive effects between road traffic and noise, has been modelled and assessed in **Chapter 10 *Noise and Vibration*** for the construction and operation phase of the proposed development. Refer to **Section 17.4.2.7**.

17.3.3.4 Secondary Effects

The potential secondary effects of the proposed development were identified as those that are reasonable given the nature of the proposed development as a waste-to-energy facility. These potential future projects identified, would be subject to assessment in their own right and therefore the potential effects of these future projects have not been assessed. Refer to **Section 17.5** below.

17.3.3.5 Transboundary Effects

Certain environmental effects of a proposed development have the potential to cross state boundaries, for example, air or water emissions, and have a 'transboundary effect'. Under the EIA Directive (2014/52/EU) the likely significant transboundary effects of a proposed development must be described.

Section 17.7 of this chapter considers the transboundary effects of the proposed development. All activities associated with the construction and operation of the proposed development were assessed for the likely significant transboundary effects.

17.4 Interaction of Effects in Different Environmental Media

17.4.1 Matrix of Potential Interactive Effects

All environmental factors are inter-related to some extent, and the relationships can range from tenuous to inextricable. The interactions between the identified environmental effects have already been considered and assessed within the individual chapters of this EIAR. There have been numerous discussions and communications between the environmental specialists and the design team throughout the design process which helped to identify and minimise the potential for significant interaction of effects. Measures to minimise effects have been incorporated into the design and are also included in all of the individual assessments and the residual effects have been assessed.

For example, where it has been established in ***Chapter 13 Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*** that there is potential for emissions to surface water and groundwater arising during construction and operation, the assessment of these emissions on people, biodiversity and water has been addressed in **Chapters 6** ***Population and Human Health,*** **12** ***Biodiversity*** **and 13** ***Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*** of this EIAR respectively. Similarly, where ***Chapter 8 Air Quality*** and ***Chapter 10, Noise and Vibration*** have established that there will be air and noise emissions during both the construction and operational phases, ***Chapter 6, Population and Human Health*** has assessed the effect of those emissions on human health and ***Chapter 12 Biodiversity*** has assessed the effects of those emissions on sensitive flora and fauna. Measures to minimise the air and noise emission effects have been designed with consideration to those interactions and have been included in the assessments and the residual effects have been identified.

Table 17.1 presents the potential interactions between the environmental factors in a matrix format. The purpose of the effects matrix is to identify potential effects in different media. Actual effects and their significance are dealt with in the most relevant chapter.

The matrix examines the potential for the environmental factor or issue in the left-hand column to have an effect on the environmental factor listed in the top row of the matrix as a result of the proposed development. As discussed above, these potential interactions of effects were identified throughout the design process and measures addressing these effects have already been included within the individual chapters of this EIAR. The paragraphs following **Table 17.1** present an assessment of the potential interactions of effects, mitigation measures and residual effects. This assessment is based on information contained within this EIAR and the outcome of discussions and interactions between the environmental specialists and the design team.

If there is the potential for an effect during the construction phase, this is indicated by a ‘C’. An ‘O’ indicates the potential for an effect during the operational phase and ‘CO’ indicates the potential for an impact during both phases. If it is considered that there will be no potential for an impact, this is indicated by ‘none’.

For example, the construction of the proposed development will require traffic movements (left hand column) which could potentially generate negative effects (“C”) on a number of environmental factors (top row of table) such as noise, air quality and climate, noise and vibration, population and human health and biodiversity. These environmental factors could then in turn result in (secondary/indirect) effects on other environmental factors. For example, excavation activities will generate material (direct impact on soil and rock resource) some of which will require transportation (secondary impact on construction traffic) and disposal (secondary impact on resource capacity offsite). Air emissions (secondary impact) arising from this construction traffic could subsequently impact on population and human health. All of these interactions and secondary/indirect effects have been considered in each of the respective chapters of this EIAR.

Table 17.1 Potential Interaction of Effects Matrix (C = Construction, O = Operational)

		Interacting Environmental Factor										
		Population and Human Health	Roads and Traffic	Air Quality	Climate	Noise and Vibration	Landscape and Visual	Biodiversity	Land and Water[1]	Heritage[2]	Material Assets	Major Accidents and Disasters
Environmental Effect	Population and Human Health		C + O								C + O	
	Roads and Traffic	C + O		C + O	C + O	C + O		C + O			C + O	
	Air Quality	C + O			C + O			C + O			O	
	Climate	C + O		C + O				C + O				O
	Noise and Vibration	C + O						C + O		C		
	Landscape and Visual	O						C + O		O		
	Biodiversity											
	Land and Water[1]	C	C	C		C	C	C		C	C	C + O
	Heritage[2]											
	Material Assets	C + O	C					C + O				
	Major Accidents and Disasters	C + O	C	C + O		C		C	C			

[1] Soils, Geology, Hydrology, Hydrogeology and Coastal Recession
[2] Archaeology, Architectural and Cultural Heritage

17.4.2 Potential Interactions

17.4.2.1 Noise and Vibration Emissions

There is the potential for noise and vibration, arising from the construction phase of the proposed development, to affect the Martello Tower (**Chapter 14 *Archaeology, Architectural and Cultural Heritage***). The potential and predicted effects of noise and vibration during construction on buildings, including the Martello Tower, is addressed in **Chapter 10 *Noise and Vibration*** of this EIAR. There is the potential for noise and vibration, arising from both the construction and operational phases, to cause disturbance to fauna. The potential and predicted effects of noise and vibration during construction and operation on fauna are addressed in **Chapters 12 *Biodiversity*** of this EIAR**.** There is the potential for noise and vibration, arising from both the construction and operational phases of the proposed development, to effect human beings (**Chapter 6 *Population and Human Health***). The potential and predicted effects of noise and vibration arising from both the construction and operational phases on human beings are addressed in **Chapter 10 *Noise and Vibration*** of this EIAR***.***

17.4.2.2 Air Emissions

There is the potential for the air emissions, arising from both the construction and operational phases of the proposed development, to effect on climate, human beings and flora and fauna. The potential and predicted effects of air emissions arising from both the construction and operational phases on climate, human beings and flora and fauna are addressed in **Chapters 9 *Climate*, 6 *Population and Human Health* and 12 *Biodiversity*** of this EIAR respectively***.***

The Department of Defence queried whether the emissions from the stack are likely to have pose a hazard to helicopters flying to Haulbowline and Spike Islands. As discussed in **Section 15.5.3.1**, this was assessed by two independent aviation experts and their reports are included in **Appendices 15.1 and 15.2** to this EIAR. Both reports demonstrate that there will be no impact on the safety of helicopter operations and navigation out of the naval base. Refer also to **Appendix 8.9.**

The US Federal Aviation Authority (US FAA) (2006) examined the issue of the safety risks of aircraft overflight of industrial stacks and determined that no accidents or incidents had been recorded, which were attributed to overflight of exhaust plumes. The US FAA determined that the risks associated with exhaust plumes is deemed acceptable. Consequently, it is considered that there is not likely to be a significant interaction between helicopter flights and the emissions to air from the facility.

17.4.2.3 Emissions to Surface Water and Groundwater

There is the potential for emissions to surface water and groundwater, arising from both the construction and operational phases of the proposed development, to have an effect on human beings, flora and fauna. The potential and predicted effects of emissions to surface water and groundwater arising from both the construction and operational phases on human beings, flora and fauna are

addressed in **Chapters 6 *Population and Human Health,* 12 *Biodiversity*** and **13 *Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*** of this EIAR respectively*.*

17.4.2.4 Landscape and Visual Effects

There is the potential for the landscape and visual effects arising from the operational phase of the proposed development, to have an effect on the cultural heritage features such as Martello Tower and Spike Island, and on the tourism potential and the residential and recreational amenity of the area. The visual effects on the cultural heritage features are addressed in **Chapters 11 *Landscape and Visual Effect*** and **14 *Archaeological, Architectural and Cultural Heritage*** of this EIAR. The landscape and visual effects on the tourism potential and the residential and recreational amenity of the area are addressed in **Chapters 11 *Landscape and Visual Effects*** and **6 *Population and Human Health*** of this EIAR. There is the potential for the proposed planting for visual screening to have an effect on biodiversity. This is addressed in **Chapter 12 *Biodiversity*** of this EIAR.

There is the potential for the lighting around the site and on the stack, during the operational phase of the proposed development, to have an impact on the residential amenity and on biodiversity. The effects of the lighting on residential amenity and on biodiversity are addressed in **Chapters 11 *Landscape and Visual Impact*** and **Chapter 12 *Biodiversity*** of this EIAR respectively and are not considered to be significant.

17.4.2.5 Socio-economic Effects

The additional employment of up to 320 construction workers in the construction phase and 63 personnel in the operation phase of the proposed development and the increased economic activity will lead to increased consumption of resources and generation of waste. The effects on the construction and operation of the proposed development on resources including waste has been addressed in **Chapter 15 Material Assets**.

The effect of the additional employment on the road network has been addressed in **Chapter 7 *Roads and Traffic*** of this EIAR and are not considered to be significant.

17.4.2.6 Traffic Effects

The increased traffic generated by the construction and operational phases of the proposed development has the potential to effect air quality, climate and human beings and to generate noise, which in turn could have an effect on human health and biodiversity. The effects of traffic on air quality and human beings due to the proposed development, and the effects of the noise generated by the proposed development are addressed in **Chapters 8 *Air Quality,* 6 *Population and Human Health*** and **10 *Noise and Vibration*** of this EIAR, respectively. The traffic generated by the development will have a negligible effect on climate.

17.4.2.7 Residues and Wastes

The residues and wastes which arise during the construction and operational phases of the proposed development have the potential to have an effect on human beings, biodiversity and surface water and groundwater quality if disposed of incorrectly. The effects of the disposal of residues is addressed in **Chapter 15 *Material Assets*** of this EIAR and are not considered to be significant.

17.4.2.8 Soils and Geology

The working methods required to excavate and fill the site to the proposed new levels and to construct the foundations of the proposed development, have the potential to affect the air and water quality, human beings, biodiversity, the Martello Tower and to generate noise. These effects are addressed in **Chapters 8 *Air Quality, 13 Soils, Geology, Hydrogeology, Hydrology and Coastal Recession,* 6 *Population and Human Health***, **10 *Noise and Vibration*** and **14 *Archaeological, Architectural and Cultural Heritage*** of this EIAR, respectively. The nature of the material excavated from the site will determine its suitability for reuse as fill. If the material is not suitable for reuse it will be disposed of to a permitted site. The potential and predicted effects on material assets are addressed in **Chapter 15 *Material Assets*** of this EIAR. The potential and predicted effects on traffic are addressed in **Chapter 7 *Roads and Traffic*** of this EIAR.

17.4.2.9 Grid Connection to ESB Networks Lough Beg Substation

The waste-to-energy facility will be connected to the national electrical grid via the existing ESB Networks 38kV electrical substation (known as Lough Beg substation) adjacent to the eastern boundary of the Hammond Lane facility. The grid connection will be made by running underground cables from the electrical substation on the Indaver site to the Lough Beg substation.

The lands over which the entire grid connection will be constructed lie within Indaver's ownership (save for a small section comprising associated works on the adjacent Lough Beg substation owned by ESB Networks). These works will be carried out by ESB Networks and did not form part of the planning application. However, the effects of the grid connection including the works required within the Lough Beg substation lands have been appraised in this EIAR.

The works required within the Lough Beg substation lands will involve some minor excavation works and modifications to electrical equipment in order to connect the underground cable into the national grid. Refer to **Section 4.5.10.2** of **Chapter 4** for further details on the connection method.

No significant effects on the environment, whether direct, indirect or cumulative have been identified in relation to the grid connection works within the Lough Beg substation lands.

17.4.2.10 Major Accidents and Disasters

There are no special or unique hazards associated with the construction of the plant on this site that would not be encountered on any normal construction site for an industrial building, as discussed in **Chapter 16 *Major Accidents and***

Disasters. Therefore, the potential interactive effects on the environment from an accident, disaster or incident during the construction of the proposed facility are those incidents identified and assessed in the respective chapters: **Chapter 6** ***Population and Human Health*****, Chapter 7** ***Roads and Traffic***, **Chapter 8** ***Air Quality, Chapter 10 Noise and Vibration, Chapter 12 Biodiversity and Chapter 13 Soils, Geology, Hydrogeology, Hydrology and Coastal Recession***.

The effects of a major accident or disaster at the proposed development during operation are identified in **Chapter 16** ***Major Accidents and Disasters*** as having the potential to have an interactive effect on human health and air quality. The chapter concludes that based on these assessments, and on the controls that will be implemented as risk reduction and risk mitigation measures, the risks associated with these scenarios were found to be as low as reasonably possible (ALARP).

17.5 Secondary Effects

There is one potential project which may be associated with the Ringaskiddy Resource Recovery Centre; a potential future district heating system. This section assesses the potential for significant secondary effects to arise from this consequential development.

The secondary effects arising from the interactions between environmental factors within the proposed development itself (such as those examples provided above in **Section 17.4.1**) have been considered in each of the respective chapters of this EIAR.

Separately, it is noted that a pre-treatment facility (waste transfer station) is not required for the operation of the Ringaskiddy Resource Recovery Centre and is not proposed as part of the current application. The provision of a waste transfer station, as a separate piece of infrastructure, was considered but ultimately not included, for the following reasons:

1. A transfer station is not required for the operation of the proposed development, as is evidenced by the Meath waste-to-energy facility, which does not have a transfer station and accepts the same waste streams as the proposed development
2. There are already transfer stations operating in Dublin, Shannon, Cork and Portlaoise.
3. Due to the advancement of waste management practices on industrial sites generating industrial waste, the provision of such a facility is not needed.

17.5.1 Potential Future Heat Network

The thermal energy generated in the waste-to-energy facility will be recovered as steam which can be used to generate electricity, directly in heat applications or in a combination of heat and power plant. The current facility design is to generate electricity from the steam and to allow for a future possibility to export heat.

Indaver is exploring the option to supply heat or steam to industries located in Ringaskiddy which has the greatest potential of all of the industrially zoned lands in Cork. Refer to **Chapter 3 *Alternatives***.

It is also a planning condition (ABP 2018) that Indaver submit a feasibility study to Cork County Council for such a heat network. The Board Order states that:

20. The developer shall commission an independent Feasibility Study in relation to the possibility for the recovery of excess heat energy from the proposed facility. The terms of reference of the study shall be agreed with the planning authority, and the report shall be completed and submitted to the planning authority within 18 months of the date of this order [29 May 2018]*, and made publicly available.*

Refer to **Appendix 1.5** of this EIAR for the complete Board Order.

The main potential impact of such a district heating system would be a reduction in the use of the fossil fuels, which are currently used to generate steam or heat in the facilities being supplied. There would be a consequent reduction in the greenhouse gas emissions. The pipework to supply the steam or hot water would probably be laid in the roads (or above-ground alongside them) in the area and there would be some disruption to road users for the duration of the construction phase.

17.6 Cumulative Effects

This section of the chapter presents the assessment carried out to examine whether the proposed development along with any other projects could cumulatively result in a likely significant environmental effect. Cumulative effects arising from the interaction between the proposed development and other projects for each of the environmental factors have been identified and addressed in detail in the respective chapters. The results of these cumulative assessments are also summarised below.

As discussed in **Section 17.3.2**, cumulative effects are defined as the combination of many minor effects creating one larger, more significant impact (EPA 2017). Cumulative effects consider existing stresses on the natural environment as well as developments that are underway and in planning.

Following a review of the committed projects and the planning files for Cork County Council, the following projects which are either in place, or proposed, were considered to have the potential for cumulative effects to increase the significance of the effects predicted for the proposed development are listed below:

Proposed Projects:

- M28 Cork to Ringaskiddy Motorway Scheme – Under judicial review. Timeline unknown, construction estimated 30-36 months;
- Local projects associated with the Community Gain Fund required by planning condition 18 of the ABP Planning Permission, May 2018; and
- Other planned/permitted projects include the following (note: the construction/operation timelines of these projects are currently unknown):
    - BioMarin - (PA No. 186603) extension to manufacturing building;

- GE Healthcare Life Science BioPark – (PL04 .248154) – planning granted. To be located in Barnahely;
- Pfizer Ireland - PA Ref 16/6937: Granted in Jan 2017; and
- Novartis – Number of permitted projects including the permitted wind turbine (planning for turbine expires November 2022).

Existing Projects

- Hammond Lane Metal Company Ltd. – now operating under a IE licence P0997-01. No further planned expansion;
- Wind turbines –Including the second De Puy 3MW turbine which is now operational since 2018. No information available on construction timeline of the permitted Novartis turbine;
- The National Maritime College of Ireland (NMCI);
- UCC ERI Beaufort Building;
- The Island Crematorium;
- Haulbowline Island Recreational Park – the park is due to be open to the public in 2019;
- Ispat Steelworks Site, Haulbowline Island – Remediation works likely in the future, but timeline known.
- Irish Naval Service base, Haulbowline Island;
- Spike Island – New masterplan is currently being prepared;
- Port of Cork – redevelopment due to be complete in 2020;
- Cork Lower Harbour Drainage Scheme – WwTP complete, other associated upgrade works (pump stations, pipelines) ongoing in the area and due to be complete in 2019;
- Residential Developments - No known planned/permitted projects;
- ESB Aghada Power Station;
- BGE Power Station at Whitegate;
- Amenity developments in Ringaskiddy;
- Ferry and Cruise Ship Business;
- Pharmaceutical and Medical Device Manufacturers.

17.6.1 Hammond Lane Metal Company Ltd.

Hammond Lane Metal Company Ltd., located adjacent to the Indaver site, was extended in 2015. Hammond Lane operates under an industrial emission (IE) licence (Reg. No. P0997-01) since 2016. The main class of the licensed activities is for 11.4(b)(iv), see below.

"11.4(b)(iv) *Recovery, or mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day involving one or more of the following activities, (other than activities to which the Urban Waste Water Treatment Regulations 2001 (S.I. No. 254 of 2001) apply): treatment in shredders of metal waste, including waste electrical and electronic equipment and end-of-life vehicles and their components."*

The potential for cumulative effects exists only for the operational effects from Hammond Lane. The effects of the Hammond Lane Metal Company Ltd, which have the potential to have a cumulative effect with the proposed Ringaskiddy Resource Recovery Centre, have been addressed in this EIAR.

The traffic associated with Hammond Lane currently was included in the background traffic levels recorded in the baseline traffic survey. The assessment of the impact of traffic from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative effect with the existing background traffic, which was increased by a growth factor to represent expected general increases in background levels in the future. This allowed for increases in activity at Hammond Lane. Refer to **Chapter 7 *Roads and Traffic*** of this EIAR.

Ferrous metals from the proposed Ringaskiddy Resource Recovery Centre could be recycled in Hammond Lane and car shred from Hammond Lane could be treated in the proposed Ringaskiddy Resource Recovery Centre. This would result in a slight cumulative net reduction in truck movements on the wider road network.

The noise emissions from Hammond Lane were recorded in the daytime ambient background noise survey undertaken for the noise impact assessment study. The assessment of the impact of noise from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative existing background noise. Refer to **Chapter 10 *Noise and Vibration*** of this EIAR.

The emissions to air from the Hammond Lane facility were included in the ambient air quality monitoring survey undertaken for the air quality impact study. The assessment of the impact of emissions to air from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative effect with the existing background ambient air quality. Refer to **Chapter 8 *Air Quality*** of this EIAR.

The potential cumulative effects of the Hammond Lane facility and the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre on biodiversity were addressed in **Chapter 12 *Biodiversity*** of this EIAR.

There is no potential for any significant cumulative effects.

17.6.2 Wind Turbines

There are currently four 3MW wind turbine in operation on industrial sites in Ringaskiddy, each with a 100 metre hub-height in:

- Two wind turbines at DePuy – There are two DePuy sites in close proximity to each other in Loughbeg, Ringaskiddy and a wind turbine is located on each site, approximately 290m south and 1.12km southwest respectively of the Indaver site boundary. Refer to **Figure 4.3**.
- The Janssen Biologics wind turbine is circa 1.9km to the west of the Indaver site boundary.

- The GlaxoSmithKline wind turbine, at Loughbeg, Currabinny, is circa 1.5km to the southwest of the site boundary.

The Novartis plant, circa 1.8km to the west of the site boundary, has ten-year planning permission for a 3MW wind turbine on their lands, however construction has not yet commenced. Planning permission for the turbine is valid until November 2022.

The cumulative visual and landscape effects of the five turbines have been assessed in the **Chapter 11** ***Landscape and Visual Effects*** of this EIAR as part of the landscape and visual background.

The assessment of the impact of traffic from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative effect with the existing background traffic, which was increased by a growth factor to represent expected general increases in background levels in the future. This increase allows for additional traffic during the construction of the Novartis turbine. Refer to **Chapter 7** ***Roads and Traffic*** of this EIAR.

Due to distance and the nature of the operation of the turbines, there is no potential for any significant cumulative effects. This is assessed in **Appendix 8.1**, ***Air Quality Study***, under the Cumulative Impacts section.

17.6.3 The National Maritime College of Ireland

The National Maritime College of Ireland (NMCI) is located in Ringaskiddy, opposite the entrance to Hammond Lane.

Any existing traffic associated with the existing the NMCI, was included in the background traffic levels recorded in the traffic survey. The assessment of the impact of traffic from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative impact with the existing background traffic, which was increased by a growth factor to represent expected general increases in background levels in the future. This allowed for increases in traffic from NMCI. Refer to **Chapter 7** ***Roads and Traffic*** of this EIAR.

The cumulative visual and landscape effects of the NMCI has been assessed in the **Chapter 11** ***Landscape and Visual Impact*** of this EIAR, as these are part of the existing landscape and visual background and there is no potential for any significant cumulative effects.

17.6.4 UCC ERI Beaufort Building

The UCC ERI Beaufort Building (construction completed in 2015), is located on the site to the east of the National Maritime College of Ireland. The MaREI (Centre for Marine and Renewable Energy) and the Lir National Ocean Test Facility are both located in the Beaufort Building. Further developments for the facilities will be located on the remainder of the land to the east of the NMCI (refer to **Figures 4.3** to **4.6**).

Any existing traffic associated with the existing Beaufort Building, was included in the background traffic levels recorded in the traffic survey. The assessment of the effects of traffic from the construction and operations phases of the proposed

Ringaskiddy Resource Recovery Centre included the cumulative effects with the existing background traffic, which was increased by a growth factor to represent expected general increases in background levels in the future. This allowed for increases in traffic from the MaREI and Lir National Ocean Test Facility. Refer to **Chapter 7 *Roads and Traffic*** of this EIAR.

The cumulative visual and landscape effects of the Beaufort Research Laboratory is being assessed in the **Chapter 11 *Landscape and Visual Impact*** of this EIAR, as these are part of the existing landscape and visual background. There is no potential for any significant cumulative effects.

17.6.5 The Island Crematorium

The Island Crematorium is located in a former naval magazine on Rocky Island, which is located between Ringaskiddy and Haulbowline Island.

The existing traffic associated with the Island Crematorium, was included in the background traffic levels recorded in the traffic survey. The assessment of the impact of traffic from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative impact with the existing background traffic, which was increased by a growth factor to represent expected general increases in background levels in the future. This allowed for increases in traffic from the Island Crematorium. Refer to **Chapter 7 *Roads and Traffic*** of this EIAR.

Any emissions to air from the Island Crematorium were included in the ambient air quality monitoring survey undertaken for the air quality impact study. The assessment of the impact of emissions to air from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative impact with the existing background ambient air quality. Refer to **Chapter 8 *Air Quality*** of this EIAR.

Due to the nature of the Island Crematorium, there is no potential for any significant cumulative effects.

17.6.6 Haulbowline Island Remediation Project

The Ispat steel manufacturing facility, located adjacent to the naval base on Haulbowline Island, ceased operation in 2001 and the buildings on the site have been demolished. The site had been undergoing remediation by Cork County Council to redevelop the East Tip which was associated with the steelworks. The East Tip remediation and landscape works are now complete, and the East Tip is due to be opened as a public park in 2019. The cumulative effects of the traffic from the remediation works and the proposed Ringaskiddy Resource Recovery Centre has been addressed in **Chapter 7 *Roads and Traffic*** of this EIAR.

The potential cumulative impact on climate from the Haulbowline East Tip remediation project development and the proposed Ringaskiddy Resource Recovery Centre was assessed in **Chapter 9 *Climate*** of this EIAR.

Haulbowline Island is more than 1km from the Indaver site. Due to the distance and the nature of the proposed works on the Island, there is no potential for any significant cumulative effects during the construction phase of the remediation works. Due to the distance and the nature of the completed development on the

Island, there is no potential for any significant cumulative effects during the operational phase of the completed development on the Island.

17.6.7 Irish Naval Service base, Haulbowline Island

The naval base at Haulbowline is the headquarters of the Irish Naval Service.

The existing traffic associated, with the existing the Naval Base, was included in the background traffic levels recorded in the traffic survey. The assessment of the effect of traffic from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative effect with the existing background traffic, which was increased by a growth factor to represent expected general increases in background levels in the future. This allowed for increases in traffic from the Naval Base. Refer to **Chapter 7 *Roads and Traffic*** of this EIAR.

Any emissions to air from shipping using the Naval Base were included in the ambient air quality monitoring survey undertaken for the air quality assessment. The assessment of the effects of emissions to air from the construction and operation phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative effects with the existing background ambient air quality. Refer to **Chapter 8 *Air Quality*** of this EIAR.

Similarly, any existing noise emission from the Naval Base, if measurable at the monitoring locations, were recorded in the ambient background noise survey undertaken for the noise assessment. The assessment of the effects of noise from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative existing background noise. Refer to **Chapter 10 *Noise and Vibration*** of this EIAR.

The Department of Defence queried whether the emissions from the stack are likely to have pose a hazard to helicopters flying to Haulbowline and Spike Islands. As discussed in **Section 15.5.3.1**, this was assessed by two independent aviation experts and their reports are included in **Appendices 15.1 and 15.2** to this EIAR. Both reports demonstrate that there will be no impact on the safety of helicopter operations and navigation out of the naval base. Refer also to **Section 17.4.2.2** above.

The Naval Base is circa 1km from the Indaver site. Due to the distance and the nature of the Naval Base activities, there is no potential for any significant cumulative effects.

17.6.8 Spike Island

As discussed in **Chapter 6 *Population and Human Health***, Spike Island is a popular visitor attraction, with boat tours operating from Cobh. Cork County Council published a master plan for Spike Island in 2012. The master plan proposes that the Island is developed as a tourist and amenity destination with improved access, ferry links to other locations in the harbour, redevelopment of the existing buildings for compatible new uses, construction of walking and cycling paths, an adventure centre, a retreat centre, a camp site and extensive landscaping. Limited tourist accommodation has been proposed.

A planning application for redevelopment of Spike Island has not been made and no specific information on potential effects is available. Spike Island is separated from the Indaver site by a channel which is circa 700m wide. Due to the distance and the nature of the proposed development on the Island, there is no potential for a significant cumulative impact during the operational phase of the proposed development on the Island.

17.6.9 Port of Cork

The Port of Cork has a significant facility in Ringaskiddy. In 2015, the Port of Cork obtained planning permission from An Bord Pleanála to extend the Ringaskiddy deep water facility. The Ringaskiddy Port Redevelopment project includes container berths and a multi-purpose berth at Ringaskiddy East, a deep-water berth extension at Ringaskiddy West, road improvements and an amenity area. There are a number of port-related facilities, such as grain stores and hard-standings for vehicle storage, in and around the Port of Cork. Construction is due to be complete in 2020.

The existing traffic associated, with the Port of Cork and associated facilities, was included in the background traffic levels recorded in the traffic survey. The assessment of the effect of traffic from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative effect with the existing background traffic, which was increased by a growth factor to represent expected general increases in background levels in the future. The cumulative effect with traffic from the extended Port of Cork facilities was also included in the assessment. Refer to **Chapter 7 *Roads and Traffic*** of this EIAR.

Any emissions to air from shipping using the Port of Cork were included in the ambient air quality monitoring survey undertaken for the air quality assessment. The assessment of the impact of emissions to air from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative effect with the existing background ambient air quality. Refer to **Chapter 8 *Air Quality*** of this EIAR.

The potential cumulative impact on climate from the Port of Cork development and the proposed Ringaskiddy Resource Recovery Centre was assessed in **Chapter 9 *Climate*** of this EIAR.

Existing noise emissions from the Port of Cork, if measurable at the monitoring locations, were recorded in the ambient background noise survey undertaken for the noise assessment. The assessment of the effect of noise from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative effects from the existing background noise and the future predicted noise emissions from the Port of Cork's extended facilities. Refer to **Chapter 10 *Noise and Vibration*** of this EIAR.

The landscape and visual assessment included an assessment of the cumulative effect with the upgraded Port of Cork facilities. The cumulative effect of the Ringaskiddy Port redevelopment on the landscape will be negative in the short term but is deemed to be positive in the medium to long term once operational as the area transitions from a slightly unkempt semi-industrial area to a more developed cluster of industry, energy and education campus style landscape. Refer to **Section 11.5.2.3** of **Chapter 11 *Landscape and Visual Effects*** of this EIAR.

The Port of Cork facilities are between 500m and 1.5km from the proposed Ringaskiddy Resource Recovery Centre. Due to the distance of the existing facilities and the nature of the proposed Port of Cork redevelopment, there is no potential for any significant cumulative effects on the environment.

17.6.10 M28 Cork to Ringaskiddy Motorway Scheme

Cork County Council, in association with the Transport Infrastructure Ireland (TII), plans to construct a new M28 motorway from the Bloomfield Interchange, near Douglas, to Ringaskiddy. Planning was granted for the scheme in 2018 (PL04.HA0053) however the project remains in the planning process at the time of writing this EIAR (2019). The construction phase of the project is estimated to be between 30-36 months however there is no indication when construction might commence.

The upgraded M28 scheme will significantly enhance the level of accessibility to the Ringaskiddy area and will remove a substantial amount of traffic from the existing road network in the area, bypassing numerous settlements such as Ringaskiddy village itself, Shanbally village and the Shannonpark Roundabout, for example. Post-construction, it is anticipated that the M28 scheme will provide significant relief to the local road network in the vicinity of the site and will allow staff and delivery vehicles to and from the Indaver site to avoid travelling through the numerous local settlements along the route. Refer to **Chapter 7 *Roads and Traffic***.

The noise emissions from the existing N28, if measurable at the monitoring locations, were recorded in the ambient background noise survey undertaken for the noise assessment study. The assessment of the effects of noise from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative existing background noise and the future predicted noise emissions from the M28. Refer to **Chapter 10 *Noise and Vibration*** of this EIAR.

The potential cumulative effects of the M28 and the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre on biodiversity were addressed **Chapter 12 *Biodiversity*** of this EIAR.

The M28 will terminate at the western boundary of the Indaver site. Due to the distance to the main part of the M28 and the likely timing, it is considered unlikely that there will be a significant cumulative effect on soils, geology, hydrology or hydrogeology during the construction or operational phases. The potential cumulative effects of the M28 and the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre on biodiversity were addressed **Chapter 12 Biodiversity** of this EIAR.

The potential cumulative effects of the M28 and the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre on climate, biodiversity, cultural heritage and material assets were addressed **Chapters 9 Climate, 14 *Cultural Heritage*** and **15 *Material Assets*** of this EIAR, respectively.

If the construction of the M28 and the proposed Ringaskiddy Resource Recovery Centre coincide, there will be a minor positive cumulative effect on human beings due to the increased employment and economic activity. The M28 may require

engineering fill and there may be unsuitable soil and stone to be removed from M28 site. The proposed Ringaskiddy Resource Recovery Centre (RRRC) will also require importing engineering fill and there will be unsuitable soil and stone to be removed from RRRC site.

Consequently, there may be a significant cumulative effect on material assets, in the demand for engineering fill and the disposal of unsuitable soil and stone. It is anticipated that the scale of the construction materials market in Ireland and the utilities capacity in the Ringaskiddy area are such that there will not be a significant cumulative impact on material assets as a result of the proposed development as discussed in **Chapter 15 *Material Assets***.

17.6.11 Cork Lower Harbour Main Drainage Scheme

Irish Water has completed construction of a new municipal sewage treatment plant at Shanbally, Ringaskiddy, for the Cork Lower Harbour Main Drainage Scheme. The plant has been operational since December 2016. The facility will treat the sewage from the Lower Harbour towns and villages including Carrigaline, Ringaskiddy and Shanbally.

Associated project works[3] are on-going and include the building of pumping stations and pipelines along roads from Passage West to Ringaskiddy. These works are expected to be complete by December 2019.

Given the extent and timeline of the remaining works, it is unlikely that there will be any significant cumulative effects as the Irish Water works are likely to be complete prior to the construction phase of the proposed development.

17.6.12 Residential Developments

Planning applications have been submitted for several small scale and single unit residential developments in the Ringaskiddy area.

The traffic associated with the existing residential developments was included in the background traffic levels recorded in the traffic survey. The assessment of the impact of traffic from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative impact with the existing background traffic, which was increased by a growth factor to represent expected general increases in background levels in the future. The traffic arising from future residential development is included in the general growth factor. Refer to **Chapter 7 *Roads and Traffic*** of this EIAR.

Due to the distance from the proposed development and the nature of the residential developments, there is no potential for any significant cumulative effects.

[3] Irish Water (2017) Cork Lower Harbour Main Drainage Project: https://www.water.ie/Cork-Lower-Harbour-Main-Drainage-Project.pdf

17.6.13 ESB Aghada Power Station

The potential cumulative effects of the 152m high stack of the ESB Aghada Power Station on the eastern side of Cork Harbour was included in the bird collision risk assessment, undertaken as part of the assessment of cumulative effects on birds, **Chapter 12 *Biodiversity*** of this EIAR.

The emissions to air from the ESB Power Station were included in the ambient air quality monitoring survey undertaken for the air quality impact study. The assessment of the impact of emissions to air from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative impact with the existing background ambient air quality. The licensed emissions from the ESB Power Station were included in the cumulative impact assessment. Refer to **Chapter 8 *Air Quality*** of this EIAR.

The assessment of the landscape and visual impact of the proposed Ringaskiddy Resource Recovery Centre included the ESB Power Station as part of the existing background. Refer to **Chapter 11 *Landscape and Visual Impact*** of this EIAR.

The ESB Power Station is circa 5km from the site of the proposed Ringaskiddy Resource Recovery Centre. Due to this distance, there is no potential for any significant cumulative effects.

17.6.14 Bord Gáis Eireann (BGE) Whitegate Power Station

The emissions to air from the Bord Gáis Eireann (BGE) Power Station were included in the ambient air quality monitoring survey undertaken for the air quality impact study. The assessment of the impact of emissions to air from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative impact with the existing background ambient air quality. The licensed emissions from the BGE Power Station were included in the cumulative impact assessment. Refer to **Chapter 8 *Air Quality*** of this EIAR.

The landscape and visual assessment of the proposed Ringaskiddy Resource Recovery Centre included the BGE Power Station as part of the existing background. Refer to **Chapter 11 *Landscape and Visual Impact*** of this EIAR.

The BGE Power Station is circa 4km from the site of the proposed Ringaskiddy Resource Recovery Centre. Due to the distance there is no potential for any significant cumulative effects.

17.6.15 Amenity Developments

The Ringaskiddy and District Residents Association received planning permission in 2014 for the construction of a community children's playground on a site adjacent to the N28 in Ringaskiddy Village. This playground has since been constructed.

The Port of Cork planning permission, referred to above, includes a public marine leisure facility at Paddy's Point located in north of the MaREI building. The facility will include a new public pier and slipway and 25m pontoon orientated to be

accessible at all stages of the tide. There will also be short-term trailer parking available.

There will be a minor positive cumulative impact on population and human health from the amenity area at Paddy's Point, the footpath proposed in the Port of Cork planning permission and the footpath and viewing gallery to the Martello Tower, which is proposed as part of proposed Ringaskiddy Resource Recovery Centre.

The proposed development will result in environmental enhancement in the immediate area in the form of an upgraded local road, an amenity footpath and viewing platform and sensitive landscaping.

Due to the nature of the amenity developments and the distance, there is no potential for any significant cumulative effects.

17.6.16 Ferry and Cruise Ship Business

Brittany Ferries operates two routes, up to four days a week during the summer months from the ferry port at Ringaskiddy; Cork-Roscoff (two days a week from March to early November) and Cork-Santander (two days a week, year-round).

Cruise liners visiting Cork Harbour come mainly in the months from April to October and usually dock at Cobh, with Ringaskiddy port facilities being used if there is a second ship in port.

The cumulative impact of the traffic generated by the weekly ferry and the cruise liners and the construction and operation of the proposed Ringaskiddy Resource Recovery Centre is addressed in **Chapter 7 *Roads and Traffic*** of this EIAR.

Due to the nature of the ferry and cruise liner traffic and the distance to the ferry port, there is no potential for any significant cumulative effects.

17.6.17 Community Gain Fund

As per Condition 19 of the planning permission granted by An Bord Pleánála in May 2018, Indaver are required to establish a community gain fund to fund environmental and other community projects and initiatives in the Ringaskiddy area. Indaver are required to submit €1/tonne of waste material accepted (or €240,000 annually) to the fund.

A payment was a condition of the Port of Cork planning permission and therefore it will be a positive cumulative impact from the two funds.

17.6.18 Pharmaceutical and Medical Devices Manufacturing Plants

There are a number of large pharmaceutical and medical devices manufacturing plants in Ringaskiddy.

The traffic associated with the pharmaceutical and medical devices manufacturing plants was included in the background traffic levels recorded in the traffic survey. The assessment of the impact of traffic from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative impact with the existing background traffic, which was

increased by a growth factor to represent expected general increases in background levels in the future. Refer to **Chapter 7 *Roads and Traffic*** of this EIAR.

The emissions to air from the large pharmaceutical and medical devices manufacturing plants in Ringaskiddy were included in the ambient air quality monitoring survey undertaken for the air quality impact study. The assessment of the impact of emissions to air from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative impact with the existing background ambient air quality. The licensed emissions from the pharmaceutical plants and the ESB and BGE power plants were included in the cumulative impact assessment. Refer to **Chapter 8 *Air Quality*** of this EIAR.

Existing noise emissions from the pharmaceutical and medical devices manufacturing plants, if measurable at the monitoring locations, were recorded in the ambient background noise survey undertaken for the noise impact assessment study. The assessment of the impact of noise from the construction and operations phases of the proposed Ringaskiddy Resource Recovery Centre included the cumulative existing background noise and the future predicted noise emissions from the pharmaceutical and medical devices manufacturing plants. Refer to **Chapter 10 *Noise and Vibration*** of this EIAR.

The landscape and visual assessment of the proposed Ringaskiddy Resource Recovery Centre included the pharmaceutical and medical devices manufacturing plants as part of the existing background. Refer to **Chapter 11 *Landscape and Visual Impact*** of this EIAR.

Due to the nature of the activities at the pharmaceutical and medical devices manufacturing plants and the distance to them from the proposed Ringaskiddy Resource Recovery Centre, there is no potential for any significant cumulative effects.

17.6.19 Other Planned and Permitted Projects

The Cork County Planning register was checked for other planned and permitted projects in the Ringaskiddy area, not already discussed, that with the proposed development could potentially have a significant cumulative effect on the environment, for example, traffic effects during construction.

There are a number of planned and permitted projects in the Ringaskiddy area however none were identified that are in proximity or of significance to potential to have a significant cumulative effect on the environment in the context of the proposed development.

17.6.20 Overall Cumulative Effect

The proposed Ringaskiddy Resource Recovery Centre will recovery energy and ferrous and non-ferrous metals from residual non-hazardous and hazardous waste, a substantial proportion of which would otherwise be exported for energy recovery. The recovered energy will be used to generate electricity, most of which will exported to the power grid, thus replacing energy generated from fossil fuels. The jobs created during construction and operation, and the contribution which Indaver and its employees will make to the local economy, will have a

slight positive economic impact on the Ringaskiddy and Cork city and county areas. The placing of sacrificial material on the beach will reduce the rate of erosion of the coastline at the site. Raising the levels and improving the drainage of the L2545 road will have a positive significant local impact on road users by reducing incidents of the road flooding.

Due to the design and proposed mitigation measures, the construction and operation of the facility is not expected to have a significant impact on air quality, climate, biodiversity, soils, geology, hydrology, hydrogeology or material assets. At peak times, the traffic from the facility will have negligible impact on the Ringaskiddy road network. Outside peak hours the Ringaskiddy road network operates below capacity and the traffic from the facility will not have a significant impact.

During the construction phase of the project, there will be a slight to major impact on nearby noise sensitive properties depending on the nature of the construction activities. However, the calculated noise effects are within the relevant criterion set for this phase. Noise from the operation of the facility will not have a significant effect on nearby noise sensitive properties.

The site will have somewhat more of an industrial character than it does at present and there will be a minor residual impact on the recreational amenity of the site and its immediate vicinity. The cumulative effect of the proposed and cumulative developments on the landscape character will have a short-term negative effect but this is deemed to be positive long-term cumulative effect once operational as the area transitions from a slightly unkempt, semi-industrial area, to a more developed cluster of industry, energy and education campus style landscape.

Although the impact on views from within a 0.5km radius to the north and east (including Rocky Island), within areas of Cobh at White Point, from the Martello Park Road as it passes adjacent to the site (including the residential property to the northwest of the site), the National Maritime College car park, Gobby Beach and Ringaskiddy Martello tower, will be significant to moderately negative in nature at the operational stage this is due to the change in view from a predominantly green ridgeline, to an industrial building. However, this is in the context of an area that is already semi-industrial in nature. Overall, the greater surrounding area is deemed capable of absorbing the development without changing the character of the Cork Harbour Landscape. There is no potential for any significant cumulative effects.

17.7 Trans-boundary Effects

17.7.1 Introduction

This section describes potential trans-boundary effects from the proposed Ringaskiddy Resource Recovery Centre. The potential for trans-boundary effects arises as follows:

- Boiler ash and flue gas cleaning residues from the proposed development will be shipped to continental Europe for recovery or disposal if there is no suitable facility available in Ireland or Northern Ireland. Refer to **Section 17.7.2** below.

- Bottom ash could possibly be exported from the proposed development to continental Europe for recovery if there are no landfill or recovery options available at a given time. Refer to **Section 17.7.3** below.
- The proposed facility will treat 24,000 tonnes per annum of hazardous waste, which currently is shipped to waste-to-energy facilities in Europe. Refer to **Section 17.7.4** below.
- In 2018 Indaver exported just under 135,000 tonnes of municipal solid waste from Ireland to waste-to-energy plants in Europe. The proposed Ringaskiddy Resource Recovery Centre would have the capacity to treat all of this waste. Refer to **Section 17.7.4** below.

17.7.2 Boiler Ash and Flue Gas Cleaning Residues

As outlined in **Section 15.5.3.10** of **Chapter 15** ***Material Assets***, circa 2,000 tonnes per annum of boiler ash and circa 9,104 tonnes per annum of flue gas cleaning residues will be produced in the Ringaskiddy waste-to-energy facility. The boiler ash and flue gas cleaning residues will be in the form of fine particles and will contain heavy metals.

It is expected that the boiler ash and flue gas cleaning residues from the Ringaskiddy facility will be similar in composition to the boiler ash and flue gas cleaning residues from the Meath facility.

The boiler ash and flue gas cleaning residues will be suitable for use in a recovery operation to backfill the void space in an underground salt mine. Currently in Northern Ireland there is one underground salt mine, licensed to use material such as the residues for backfilling in Carrickfergus, Co. Antrim. This facility is currently being utilised by Indaver's waste-to-energy plant in Co. Meath and the facility is also suitable for receiving and treating similar hazardous residues from the Ringaskiddy Resource Recovery Centre. It is envisaged that the proposed development will also avail of this local solution in Northern Ireland.

As the material is already pre-treated and is in a solid monolithic form (if sent to this particular facility), as described in **Section 4.13.4** of **Chapter 4** ***Description of the Proposed Development***, the transport of the pre-treated material to the facility in Northern Ireland is not likely to have significant negative effect on the environment.

Boiler ash and flue gas cleaning residues from Indaver's Meath facility are also shipped to underground salt mines in Germany where the residues are solidified and used to backfill the mine instead of using other raw materials.

It is proposed that, if the facility in Northern Ireland is not available, the boiler ash and flue gas cleaning residues from the proposed Ringaskiddy facility will also be shipped to underground salt mines in Germany and this activity is not likely to have significant negative effect on the environment.

17.7.2.1 Transport to and use of residues in Germany

Two container truck loads per week of boiler ash and eight or nine container truck loads per week of flue gas cleaning residues will be removed from the Ringaskiddy facility. If the facility in Northern Ireland is not available, the boiler ash and flue gas cleaning residue containers will be taken to a port, loaded onto

a ship and shipped to Rotterdam in the Netherlands, or another container port in Europe. From the port of entry, the containers will be transported by road to the final destination. The proposed final destination is the Hattorf and Wintershall Reutilisation Facility, which is an underground salt mine in Germany. The facility has been approved for the reutilisation by the relevant authorities in Germany. Boiler ash and flue gas cleaning residues from Indaver's Meath facility are currently shipped to the Hattorf and Wintershall Reutilisation Facility.

As discussed in **Section 15.5.3.10** of **Chapter 15** ***Material Assets***, the regulation of the transport of the boiler ash and flue gas cleaning residues will be subject to Trans Frontier Shipment (TFS) licence which is a licence which must be approved by the origin/destination/transit authorities consenting to the movement/transit and acceptance of wastes between EU member states. The regulation governing this is EU Regulation 1013/2006. This licence tracks waste from origin to destination and ensures that each authority is aware of the status of the waste until final recovery when the individual TFS notification annex consigned with each shipment is signed off as having been received and treated by the receiver. This completed licence is then circulated back to Indaver as the producer as well as all relevant authorities this activity is not likely to have significant negative effect on the environment.

17.7.2.2 Quality Standards for shipping containers

As discussed in **Section 15.5.3.11** of **Chapter 15** ***Material Assets***, boiler ash and the flue gas cleaning residues will be loaded into a container truck in the Ringaskiddy facility. The container must have a valid safety approval plate or "CSC plate". CSC is the abbreviation for Convention for the Safe Containers. The CSC is an international regulation that has been developed for all the containers used for international transport, with the aim of achieving the highest possible level of safety of human life in the handling, stacking and transporting of containers. The "CSC plate" is the guarantee that the container is safe to travel. A safety certificate is issued by the container manufacturer. The certificate is renewed after 5 years, then every 30 months, by a certified inspector. Standards, such as EN ISO 6346 for compulsory identification marking, are also followed. Prior to loading the container, a check is carried out to ensure the container is fit for purpose. Therefore this activity is not likely to have significant negative effect on the environment.

17.7.2.3 Risk of a shipping accident

Van Den Bosch is an international logistics services provider which transports boiler ash and the flue gas cleaning residues for Indaver. Van Den Bosch confirmed that in the 51 years of its history none of its containers has ever fallen overboard and no ship has sunk with its containers on board. Therefore, this activity is not likely to have significant negative effect on the environment.

17.7.2.4 Behaviour of boiler ash and flue gas cleaning residues in contact with water

If the boiler ash and flue gas cleaning residues come in contact with water, they will solidify. Thus, if there was a shipping accident, and the container entered the sea and was holed, the boiler ash and flue gas residues would solidify on contact

with water. The solidified boiler ash and flue gas residues could then be removed from the seabed along with the container truck. Therefore, this activity is not likely to have significant negative effect on the environment.

17.7.2.5 Potential for impact at the reutilisation facility

The aforementioned salt mines in Germany are required to comply with the requirements of the EIA Directive and therefore were subject to the EIA process prior to the acceptance of any waste material. This Directive on Environmental Assessment aims to provide a high level of protection of the environment and to contribute to the integration of environmental considerations into the development of projects such as salt mines accepting hazardous waste with a view to reducing their environmental impact.

Similarly, the existing licensing process which all of these salt mines are subject to, requires compliance with an ongoing environmental monitoring regime in the form of stringent licence conditions. The issuing of such licences by competent authorities pursuant to the requirements laid down in the Waste Framework Directive stipulate that all necessary safety and precautionary measures, monitoring and control operations and closure and after-care provisions must be included in the granting of all such licences.

Such conditions set out the legal constraints under which salt mines must operate in order to ensure that all operations are conducted in compliance with the requirements of the Waste Framework and Landfill Directives and do not cause environmental pollution.

Therefore, the potential treatment of the boiler ash and flue gas cleaning residues is not likely to have significant negative effect on the environment.

17.7.2.6 Conclusion on Potential for Trans-Boundary Effects in the Netherlands or Germany

Netherlands

Given the low risk of a shipping accident, the low risk of leakage from the transport containers, and the fact that the boiler ash and flue gas cleaning residues will solidify on contact with water, if there is a release, it is not likely that there would be a significant adverse trans boundary impact due to the shipping of the boiler ash and residues to Rotterdam or another European container port.

Germany

Given the fact that the proposed final destination, the Hattorf and Wintershall Reutilisation Facility, has been approved for backfilling using material such as the boiler ash and flue gas cleaning residues by the relevant competent authorities in Germany, and that the operator and German authorities are subject to EU environmental legislation, it is not likely that there would be a significant adverse trans boundary impact due to backfilling of the residues in the Reutilisation Facility in Germany.

17.7.2.7 Boiler Ash and Flue Gas Cleaning Residue Transport to and use in Northern Ireland

As discussed in **Section 15.5.3.10** of **Chapter 15** ***Material Assets***, an underground saltmine in Northern Ireland now has the necessary consents to allow the backfilling, using pre-treated boiler ash and flue gas cleaning residues from waste-to-energy facilities. It is likely that pre-treated residues from the proposed Ringaskiddy Resource Recovery Centre would be transported by road to this facility in Northern Ireland.

Planning permission and a permit to operate have been granted by the relevant competent authorities in Northern Ireland. As Northern Ireland is subject to EU environmental legislation, including the environmental liabilities directive, 2004/35/CE, the competent authorities and operators of such a facility have to comply with the requirements of this legislation in granting approval and operating the facility.

Unlike the transport of the dry residues in powder form in container trucks to Germany as described above, the residues are pre-treated by mixing with water and depositing the mixture into 1m^3 bags for transport. The mixture in the bags goes hard quite quickly making the release of the material into the environment as a result of an accident during transport very unlikely. In the event of an accident during transport, the material is easily recovered as a solid mass contained within individual bags.

Consequently, it is not likely that there would be a significant adverse transboundary impact due to the backfilling of the residues in an underground salt mine in Northern Ireland.

17.7.3 Potential Trans-boundary Effects for Shipment of Bottom Ash to Continental Europe

As discussed in **Section 15.5.3.9** of **Chapter 15** ***Material Assets*** and mentioned in **Section 17.7.1** above, there is a possibility of the export of bottom ash for recovery in continental Europe. The method of transport would be by ship and in bulk in consignments of 3,000 tonnes per shipment. The likely shipping route would be from Cork Port to Rotterdam. In the event of an accident during transport of the bottom ash at sea, the loss of the material to the seabed would not have a significant effect as the leachability of the bottom ash is low and it mainly constitutes, ferrous & non-ferrous metals, silicates (sand-type material) and inert material such as ceramics, glass and stones.

The facilities that the bottom ash would be sent for recovery have also been subject to the requirements of the Waste Framework and EIA Directives and the EIA process of the relevant jurisdiction. These outlets are also subject to a separate national licensing regime on an ongoing basis which is a constituent part of the European law framework as laid down in the Waste Framework Directive.

Consequently, it is not likely that there would be a significant adverse transboundaryeffect due to the recovery of bottom ash at a facility in continental Europe.

17.7.4 Potential Trans-boundary Effects due to Reduced Amounts of Hazardous and Municipal Solid Waste being Exported to Europe

Currently hazardous waste is exported from Ireland by ship for treatment in waste-to-energy facilities in Europe. The proposed Ringaskiddy Resource Recovery Centre would treat up to 24,000 tonnes per annum of this waste. This would reduce the amount of hazardous waste being exported by ship from Ireland to ports in Europe and transported onwards by road to the final destination. There would be a consequent reduction in the risk to the environment posed by the transport of this waste. However, as 2.5 million tonnes per annum (source Eurits) of hazardous waste are transported around Europe and treated in waste-to-energy facilities there, the positive impact of the reduction in risk to the environment would not be significant.

In 2017 Indaver exported just under 135,000 tonnes of municipal solid waste from Ireland to waste-to-energy plants in Europe. The proposed Ringaskiddy Resource Recovery Centre would have the capacity to treat all of this waste. This would reduce the amount of municipal solid waste being exported by ship from Ireland to container ports in Europe and transported onwards by road to the final destination. However, as a total of 78 million tonnes per annum of municipal solid waste are treated in waste-to-energy plants in Europe, the reduction in the amount of municipal solid waste being recovered in Europe would not be significant.

17.8 Do-Nothing Effects

A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge is provided in a number of chapters of the EIAR.

Each specialist assessment chapter (**Ch 6 – 16**) includes a detailed description of the baseline conditions with regard to the specific environmental aspect based on the best available environmental information and scientific knowledge. Each of these specialist assessments also includes an outline of the potential changes from the baseline scenario without the implementation of the project – in the assessment of the 'do-nothing' scenario and for example, in the description of future year traffic growth rates during construction (**Section 7.7.1** of the EIAR, **Chapter 7** ***Traffic and Transport***) and operation (**Section 7.7.13**). A summary of the "do-nothing scenario". for all of the specialist assessments is provided below.

In conclusion, if the project were not to proceed, cumulative signficant adverse effects on the environment would not arise

17.8.1 Population and Human Health

In the 'do-nothing' scenario, residential and other development will continue in other areas around Cork Harbour, apart from in the coastal areas zoned for protection. Amenity and tourism developments are proposed for Spike Island and near completion at Haulbowline Island, in the vicinity of the proposed Resource Recovery Centre.

In a do-nothing scenario there will remain a deficiency of appropriate waste management options for the Cork and Munster areas which may hinder development of the urban areas and industry.

Given the nature of the proposed development, human health has primarily been assessed in terms of air quality and also noise (for the construction phase particularly).

Chapter *8 Air Quality*, concludes that, for the "Do Nothing" scenario the existing air quality emission sources contained within the area of the proposed development will remain in place. Therefore, the existing baseline air quality environment is not expected to change in the "Do Nothing" scenario.

Chapter 10 *Noise and Vibration*, concludes that in the event that the proposed development does not proceed, the existing noise environment in the vicinity of the site are expected to remain unchanged assuming no additional development in the area. There are a number of additional developments proposed within the area however, which have the potential to alter the existing environment including the M28 Cork to Ringaskiddy Motorway Scheme and the Port of Cork development. The noise environment resulting from these proposed developments will introduce new sources to the surrounding environment and are likely to lead to increased noise levels at noise sensitive locations in proximity to these developments.

Based on past trends and current planning policy at development plan and local area plan level, it can be expected that residential development in Ringaskiddy and Shanbally villages will be confined to that which is required to meet local needs.

In summary, under the 'do-nothing' scenario, if the proposed development were not to go ahead, it is unlikely that the community population health status would change from the current baseline.

17.8.2 Roads and Traffic

As discussed in **Section 7.10.1.12**, if the proposed development were not to proceed (i.e. in a 'Do Nothing' scenario), traffic conditions in the local area would continue to experience periodic capacity issues at critical junctions at specific times of the day, primarily during the morning and evening peak periods. This would continue in line with future traffic growth and the realisation of any other planned developments in the study area over the coming years.

Whilst the proposed M28 upgrade scheme would expected to provide relief to the local road network through the removal of a degree of traffic, including more 'strategic' traffic flows, nevertheless there will still be a need to ensure that the local road network is adequately managed so as to maintain operational capacity at key junctions during peak periods.

17.8.3 Air Quality

As discussed in **Section 8.5.1** of **Chapter 8 *Air Quality***, the existing air quality emission sources contained within the area of the proposed development will remain in place. Therefore, the existing baseline air quality environment is not expected to change in the "Do Nothing" scenario.

17.8.4 Climate

As discussed in **Section 9.5.1** of **Chapter 9 *Climate***, in the absence of the facility, the impact on climate will not be significant.

17.8.5 Noise and Vibration

As discussed in **Section 10.5.1** of **Chapter 10 *Noise and Vibration***, in the event that the proposed development does not proceed, the existing noise environment in the vicinity of the site are expected to remain unchanged assuming no additional development in the area. There are a number of additional developments proposed within the area however, which have the potential to alter the existing environment including the M28 Cork to Ringaskiddy Motorway Scheme and the Port of Cork development. The noise environment resulting from these proposed developments will introduce new sources to the surrounding environment and are likely to lead to increased noise levels at noise sensitive locations in proximity to these developments. For the other future developments, these are subject to individual noise and vibration impact assessments and will be required to satisfy all planning conditions relating to noise and vibration control.

17.8.6 Landscape and Visual

As discussed in **Section 11.5.1** of **Chapter 11 *Landscape and Visual***, in the event of the development not proceeding, the site will continue to remain as open green scrub land and agricultural use in the western fields in the shorter term with Hammond Lane Recycling site located adjacent to the site. The lands may none the less be directly impacted in the future by the proposed re-alignment of the M28 Cork to Ringaskiddy Motorway Scheme and by other built development that may subsequently be proposed on the lands as anticipated in the Cork County Development Plan 2014.

17.8.7 Biodiversity

As discussed in **Section 12.5.1** of **Chapter 12 *Biodiversity***, in the absence of development, it is expected that the small areas which are currently managed intensively for agriculture (arable and pasture) would remain under the same management regime. The general pattern of succession from scrub with patches of grassland to woodland would be expected to continue on areas that are not currently grazed. If sufficient time elapsed without development, the unused areas of the site would be expected to develop a covering of woodland with a mix of native and introduced species. However, on-going monitoring and management of Japanese Knotweed and Rhododendron is required to avoid further spread. Indaver will continue to manage the spread of non-native plant species on the lands within its own control regardless of whether the proposed development proceeds or not.

17.8.8 Soils, Geology, Hydrogeology, Hydrology and Coastal Recession

As discussed in **Section 13.5.1** of **Chapter 13** ***Soils, Geology, Hydrogeology, Hydrology and Coastal Recession***, in the scenario where the proposed Indaver facility and road upgrade were not to be developed, there would be no resulting effects on the soils, geology, hydrogeology or hydrology in the area. In the scenario where the proposed sacrificial beach material was not to be undertaken, coastal recession would continue as it is at present.

The L2545 road would continue to flood following heavy rainfall because the road drainage is inadequate. Excess surface water from the road would be diverted to the western field. There is a risk that a 1 in 200-year tidal flood event, combined with sea level rise as a result of climate change, would cause flooding to a small area of the site adjacent to the road.

17.8.9 Archaeology, Architectural & Cultural Heritage

As discussed in **Section 14.5.1** of **Chapter 14** ***Archaeology, Architectural and Cultural Heritage***, if development does not proceed the existing landscape will remain in its current condition.

17.8.10 Material Assets

As discussed in **Section 15.5.1** of **Chapter 15** ***Material Assets*****,** if the proposed development did not go ahead, it is likely that the site would continue in its current use, in the short term. In the longer term, it is likely that the land would be developed at some point in the future for an industrial or educational use based on the value of the site associated with its zoning in the Cork County Development Plan 2014 and the Ballincollig Carrigaline Municipal District Local Area Plan 2017.

17.8.11 Major Accidents and Disasters

As discussed in **Section 16.5.1** of **Chapter 16** ***Major Accidents and Disasters***, in the do-nothing scenario, the potential risk of the proposed development causing, or being affected by a disaster and/or accident would be eliminated as the Ringaskiddy Resource Recovery Centre would not be implemented. Any existing risks of any major accidents or disasters from existing developments would remain, should the proposed development not go ahead.

17.9 References

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

Environmental Protection Agency (2002) *Guidelines on The Information to be Contained in Environmental Impact Statements* EPA, Wexford

Environmental Protection Agency (2003) *Advice Notes on Current Practice (In the Preparation of Environmental Impact Statements)* EPA, Wexford

Environmental Protection Agency (2010) *Waste Licence Landfill for Non-Hazardous Waste WA0146-02* EPA, Wexford

Environmental Protection Agency (2015) *Advice Notes for Preparing Environmental Impact Statements Draft* EPA, Wexford

Environmental Protection Agency (2015) *Revised Guidelines on The Information to be Contained in Environmental Impact Statements Draft* EPA, Wexford

Environmental Protection Agency (2017) *Guidelines on the Information to be contained in Environmental Impact Assessment Reports*, Draft, August 2017.

European Commission (2017) *Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report*. (Office for Official Publications of the European Communities 2017).

Office for Official Publications of the European Communities (1999) *Guidelines for the Assessment of Indirect and Cumulative Effects as well as Impact Interactions*, Office for Official Publications of the European Communities, Luxembourg