15. Material Assets

15.1 Introduction

This chapter describes and assesses the potential impacts of the proposed development on material assets. The existing environment is also described. Mitigation measures are proposed, where required and the predicted residual effects are described.

The proposed development will consist principally of a waste-to-energy facility (waste incinerator) for the treatment of up to 240,000 tonnes per annum of hazardous and non-hazardous residual household, commercial and industrial waste which is currently landfilled, exported or treated at a waste to energy facility further from the waste source. Up to 24,000 tonnes per annum of suitable hazardous waste will be treated at the facility. The facility will maximise the extraction and recovery of valuable material (in the form of ferrous and non-ferrous metals) and energy (in the form of 21 megawatts (MW) of electricity) resources from residual waste.

In addition to the provision of the waste-to-energy facility, the proposed development will include an upgrade of a section of the L2545 road, a connection to the national electrical grid, an increase in ground levels in part of the site, coastal protection measures above the foreshore on Gobby Beach and an amenity walkway to the Ringaskiddy Martello tower.

15.2 Assessment Methodology

15.2.1 General

Material assets are defined in the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022) as '*built services and infrastructure'*: Refer to Section 3, page 31 of the EPA guidelines which state:

"In Directive 2011/92/EU this factor included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes transport infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils."

According to the EPA guidelines, the three main areas of focus under the heading of material assets are:

- Built Services
- Roads and Traffic
- Waste Management

Built services and waste management are addressed in this chapter. Where relevant, effects on particular material assets such as the road network and construction waste disposal facilities are considered in detail elsewhere in this EIS.

Refer to **Chapter 5** ***Construction Activities*** and **Chapter 7** ***Roads and Traffic*** of this EIS for further assessment of the impact of the proposed development on these assets. Cultural heritage is dealt with in **Chapter 14** ***Archaeological, Architectural and Cultural Heritage*** of this EIS. Refer to **Chapter 4** ***Description of the Proposed Development*** of this EIS for a detailed description of the proposed development site and surrounding areas.

The use of natural resources in the context of material assets (water supply, energy and materials) is addressed in this chapter. Projections of resource use were made, for both the construction and operational phases of the proposed development, and the potential effects assessed. The use of natural resources in the context of other environmental factors such as soil (**Chapter 13**) and biodiversity (**Chapter 12**) are addressed elsewhere in this EIS.

There are no quarries or mineral resources on or adjacent to the proposed development site (Refer to **Chapter 13 *Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*** of this EIS for further details).

"Land Take" is also addressed in this chapter. Land take is defined in the EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022) as *"Removal of productive land from potential agricultural or other beneficial uses." Land zoning* is primarily addressed in **Chapter 2 *Policy and Planning Framework and Need for the Scheme*** and **Chapter 3 *Alternatives*** but is also touched upon in this chapter. The effects of the proposed development on land in the context of "*landscape and visual*" are addressed in **Chapter 11 *Landscape and Visual Assessment***. The use of natural resources in the context of land use and land take is also addressed in this chapter.

A desk study was carried out on the existing material assets associated with the site of the proposed development.

15.2.2 Guidance and Legislation

This chapter has been prepared having regard to the following guidelines:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022).
- Government of Ireland (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018).
- European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report.
- Department of Housing, Planning, Community and Local Government (2017) Key Issues Consultation Paper on the Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems.
- Department of Housing, Planning and Local Government (2018) Circular PL 05/2018 -Transposition into Planning Law of Directive 2014/52/EU amending Directive 2011/92/EU on the effects of certain public and private projects on the environment (the EIA Directive) And Revised Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.
- European Commission (2012) Interpretation suggested by the Commission as regards the application of the EIA Directive to ancillary/associated works.
- European Commission (1999) Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions; and
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA 2003).

15.3 Baseline Environment

15.3.1 Site Location

The site of the proposed development is located approximately 15km to the south-east of Cork City, in the townland of Ringaskiddy on the Ringaskiddy Peninsula in the lower part of Cork Harbour. Refer to **Figures 1.1** and **1.2** in **Chapter 1 *Introduction*** of this EIS which show the site location and existing site layout respectively.

The L2545, the main road from Ringaskiddy village to Haulbowline Island forms the northern boundary of the proposed development site. The eastern boundary of the proposed development site extends to the foreshore of Cork Harbour along Gobby Beach.

The lands to the immediate south are in agricultural use. The single carriageway from Barnahely to Ringaskiddy element of the M28 Cork to Ringaskiddy project (known as the '*Protected Road Scheme'*) is currently being constructed within the northwestern boundary of the proposed development site.

The proposed development site surrounds the Hammond Lane Metal Recycling Co Ltd facility. The proposed development site is located approximately 800m east of the village of Ringaskiddy.

15.3.2 Land Use and Wayleaves

15.3.2.1 Land Use and Zoning

The proposed development site is approximately 13.55 hectares. The majority of the proposed development site is within the ownership of Indaver. An Bord Pleanála approved the M28 Cork to Ringaskiddy Project Motorway Scheme in 2017, the M28 Cork to Ringaskiddy Protected Road Scheme and the M28 Cork to Ringaskiddy Project Service Area Scheme Compulsory Purchase Order on the 31st May 2017 and the scheme (with modifications) became operative on the 28th September 2018. Cork County Council served a Notice to Treat dated 26th March 2021 on Indaver to acquire Indaver's interest in the lands. The lands have been transferred to Cork County Council under a Deed of Transfer dated 14th February 2023. The planning boundary for the proposed development remains the same as outlined in the 2016 EIS. Cork County Council have confirmed that they have no objection to the lands which were subject to the CPO being included in the planning boundary. This is included in **Appendix 1.3 o**f this EIS.

The proposed development site is situated on a north-facing slope, the land rises from north to south, and also generally from east to west. As discussed in **Chapter 12 *Biodiversity***, a high proportion of the study area, including the proposed development site, is covered in scrub, which has become more dominant over time in the absence of development. The remainder of the proposed development site consists of grassland formerly under conventional agricultural management which has now reverted to semi-natural grassland in the absence of management.

The relatively flat and low-lying areas in the northern parts of the proposed development site adjacent to the road, to the east and west of the Hammond Lane facility, are poorly drained due to the gradient and possibly due to the presence of the thicker glacial deposits (refer to **Chapter 13 *Soils, Geology, Hydrogeology, Hydrology and Coastal Recession***). Ponding of water has been noted in these areas during winter months.

The provision of a strategic large-scale waste treatment facility at the proposed development site in Ringaskiddy, which is both an Industrial Area and Strategic Employment Location, is in line with the Industrial Areas zoning objective ZU 18-16 of Chapter 18 of the Cork County Development Plan 2022-2028 (CDP), as discussed in **Chapter 2 *Policy and Planning Framework and Need for the Scheme***.

15.3.2.2 Wayleaves

There is an existing underground 300mm diameter 19Bar gas transmission main located within the proposed development site which has been recently de-commissioned by Gas Networks Ireland (GNI). The gas main runs along the southern boundary of the proposed development site and then is routed northwards through the site. The gas main terminated at an Above Ground Installation (AGI) along the Haulbowline Road before the bridge to Rocky Island, which has also recently been decommissioned.

GNI has decommissioned the gas pipeline by degassing it and filling it with grout. The pipeline has therefore been made safe and has been left in situ in the ground.

Due to the nature of the proposed works, sections of the in-situ grouted gas main will require removal. No consultation with GNI is required for these works as the wayleave on the gas pipeline route through the proposed development site will be extinguished in due course. The section of pipe to be removed within the proposed development site is shown on the planning drawings.

In addition, there is a wayleave on Indaver-owned lands for existing twin 110 kV overhead power lines. These lines are supported by steel pylons and run approximately parallel to the southern boundary of the proposed development site, located just to the south of the site.

Finally, there is a wayleave on Indaver owned lands for three underground 220kV lines to the east of the Gobby Beach car park. These three underground 220kV power cables are also located beneath the L2545 road along the northern boundary of the proposed development site.

15.3.3 Local Settlement

The nearest settlement to the proposed facility is the village of Ringaskiddy. Other settlements in the area include Shanbally, Monkstown, Passage West, Carrigaline, Crosshaven and Cobh.

15.3.4 Built Services

15.3.4.1 Road Infrastructure, Access and Traffic

The proposed development site is served by the L2545 road which is a continuation through Ringaskiddy village of the N28. The N28 is a National Primary Route which links Cork City to Ringaskiddy. A 1.5 km single carriageway section of the M28 Cork to Ringaskiddy Motorway Project, referred to as the '*Protected Road Scheme*', is currently under construction. This section extends from Barnahely to the eastern side of Ringaskiddy and intersects the northwestern boundary of the proposed development site. The construction stage of the Protected Road Scheme is nearing completion at the time of writing this EIS. The remaining elements of the main M28 Cork to Ringaskiddy Motorway Project, which will upgrade the corridor to a dual carriageway standard, are expected to have a construction duration of approximately 36 months.

As outlined in **Section 15.3.2.1** above, Cork County Council CDP lands in the northwest of the proposed development site in order to construct the '*Protected Road Scheme'* element of the main M28 Cork to Ringaskiddy Project.

15.3.4.2 Power

There are 10kV and 38kV power lines traversing the proposed development site.

A 38kV line enters the ESB Networks substation adjacent to the Hammond Lane facility from the southwest. Two 10kV lines are present - one runs approximately north–south along the eastern part of the site, adjacent to Hammond Lane, and crosses the L2545 into the Beaufort Research Laboratory lands to the north; the other follows a similar north–south alignment near the western boundary of the site.

Twin 110kV overhead power lines, supported by steel pylons, run parallel to the southern boundary of the site.

There are three underground 220kV power cables located beneath the L2545 road along the northern boundary of the proposed development site.

15.3.4.3 Water Supply

There is a 450mm diameter Irish Water main in the L2545 road adjacent to the proposed development site's northern boundary. As explained in **Chapter 13 *Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*** of this EIS, the bedrock aquifer beneath the proposed development site is mudstone/sandstone and is rated as "*LI: Locally Important Aquifer – Bedrock which is moderately productive only in local zones*" (GSI). The vicinity of the proposed development site is served by the public water supply (450mm diameter Irish Water) and there are no known wells in close proximity to the proposed development site.

15.3.4.4 Gas Supply

Details on the existing underground 300mm diameter 19Bar gas transmission main located within the proposed development site which has been recently de-commissioned by Gas Networks Ireland (GNI) are provided in **Section 15.3.2.2** above.

There is an existing 4 bar gas distribution main located beneath the L2545 road. The diameter of the main reduces from 180mm diameter to 125mm diameter after the supply tee to the National Maritime College of Ireland (NMCI). The 125mm section is to the east of the tee.

15.3.4.5 Underground services along the L2545 road

In addition to the 450mm diameter watermain, 220kV electricity cables and 4 bar 125mm gas distribution main, there are public lighting cables, Eircom underground cables, Enet fibre optic cables, private foul sewer and surface water drainage pipes located underneath the L2545 road. As discussed above, a 10kV overhead power line crosses the road.

15.3.4.6 Drainage

Surface water within the proposed development site boundary appears to drain through naturally occurring channels along the field boundaries following the natural topography of the landscape which falls from 41m OD in the south of the proposed development site to 2m – 3m OD at the northern boundary with the road. The relatively flat and low-lying areas in the northern parts of the proposed development site adjacent to the road, to the east and west of the Hammond Lane facility, are poorly drained due to the gradient and possibly due to the presence of the thicker glacial deposits. Ponding of water has been noted in these areas during winter months.

Background to flooding issues on the L2545

The existing levels of the road along the northern boundary of the proposed development site are set at circa 2.4m to 2.95mOD. Based on a review of all available information, the predicted 1 in 200 year design tidal level has been estimated as 2.87mOD. Sections of the road close to the Gobby Beach car park are below this level and are therefore at risk of tidal flooding during a 1 in 200 year tidal event, and events of lesser magnitude (as low as the 1 in 10 year tidal flood event for the most low-lying parts of the road).

Based on a review of the historic flooding of the road, discussions with Cork County Council, and the preliminary flood risk assessment mapping produced by the OPW, there is a known risk of pluvial flooding of the road during periods of heavy rainfall combined with high tide.

The existing storm water drainage system along the road was recently upgraded as part of the recently-completed Ringaskiddy urban realm and active travel scheme.

The invert level of the outfall (on Gobby beach) is -0.28mOD. As the level of the tide rises above this elevation the drainage system can become tide locked if there is insufficient differential head at the outfall. When this occurs the surface water which has reached the pipe is unable to discharge through the outfall and collects in the drainage pipe. The discharge pipe becomes surcharged and any subsequent rain water falling on that area of the road normally drained by the existing gullies cannot drain away and causes the road to flood. This area of the road is located adjacent to the entrance to the public car park at Gobby Beach.

The design of the L2545 upgrade incorporates measures to mitigate both tidal and pluvial flooding risks identified along the northern boundary of the proposed development site. These include improved stormwater drainage infrastructure and elevation adjustments to reduce the likelihood of tide-locking and surface water accumulation during simultaneous high tide and heavy rainfall events.

Currently no foul sewer serves the proposed development site. There is an Irish Water foul sewer network in Ringaskiddy Village which is located just west of the western extent of the proposed development site and is connected to the Lower Harbour wastewater treatment facility at Shanbally.

15.3.5 Natural resources

There are no quarries or mineral resources on or adjacent to the proposed development site. As explained in **Chapter 13 *Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*** of this EIS, the bedrock aquifer beneath the proposed development site is mudstone/sandstone and is rated as "*LI: Locally Important Aquifer – Bedrock which is moderately productive only in local zones*". The vicinity of the proposed development site is served by a public water supply and there are no known wells in close proximity to the proposed development site.

15.4 Characteristics of the Proposed Development

The characteristics of the proposed development in relation to material assets are as follows:

- The lands within Indaver ownership will be required for the proposed development.
- Service diversions will be required in order to facilitate the proposed development construction.
- The waste-to-energy facility will convert the thermal energy produced by the combustion of the waste into approximately 21 MW of electricity. Approximately 18.5 MW being exported to the local electrical distribution system. A grid connection to the national grid will be required for operation of the proposed development.

- Power and water supply will be required in addition to an upgraded foul and surface water drainage system.
- The L2545 road will be upgraded.
- Coastal protection works in the form of shingle will be required.
- Raw materials will be required as process inputs.
- Residues from waste will be generated during operation phase.
- There will be movement of materials on and off site during the construction phase.
- Low-lying areas of the proposed development site will be raised to 4.55m OD; and
- Utilisation of land for the construction and operation of the proposed development (land take).

15.5 Potential Effects

This section describes the likely significant effects of the proposed development on material assets. Potential effects represent the worst-case scenario in the absence of mitigation.

15.5.1 'Do-Nothing' Scenario

If the proposed development did not go ahead, it is likely that the proposed development 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 proposed development site associated with its zoning in the Cork County Development Plan 2022-2028.

The L2545 road previously experienced flooding following heavy rainfall due to inadequate drainage. However, the new urban realm scheme currently under construction has helped to address this issue through improved drainage infrastructure. While the recent urban realm works will reduce the extent of excess surface water from the road entering the western field, it will not remove the flooding completely. Refer to the Flood Risk Assessment Report (**Appendix 13.4**) for further discussion and detail.

Existing services would remain the same as current baseline in the do-nothing scenario.

The proposed waste-to-energy facility will convert the thermal energy produced by the combustion of the waste into approximately 21 MW of electricity. Approximately 2.5 MW will be used by the plant itself, with the remainder, approximately 18.5 MW being exported to the local electrical distribution system. This potential energy source would not be generated in the do-nothing scenario.

15.5.2 Construction Phase

15.5.2.1 Land Use and Land Take

Land Use

The construction phase will have a slight positive long-term effect on the land use of the western fields as the proposed raising of the land levels will mean it will no longer be as vulnerable to flooding. The construction phase will have a temporary slight negative effect on the land take of the western fields as those lands will not be in agricultural use during the construction phase.

The lands east of Hammond Lane will be used for the construction and operation of the proposed development. This section of the proposed development site is not in active use or used for any agricultural purpose at present, it is not of high biodiversity value (Refer to **Chapter 12 *Biodiversity***), and it is zoned for industrial use.

Given the zoning of the proposed development site and the current use of the proposed development site, it is not considered that the change of use in land will result in a significant negative effect.

Land Take

As described previously, land take is defined in the EPA Guidelines (2022) as "*Removal of productive land from potential agricultural or other beneficial uses*". Most of the land required for the proposed development during construction (and operation) is within Indaver ownership and additional land take is not required.

Construction of the proposed development will require temporary land take of the western fields to accommodate construction activities. Construction (and operation) will require permanent land-take of the lands east of Hammond Lane to accommodate the waste-to-energy facility. Given the zoning of the proposed development site, the current use of the proposed development site, Indaver ownership of lands, it is not considered that the land-take will result in a significant negative effect.

The proposed development will have a long-term, neutral effect on the land take of the lands east of Hammond Lane during construction. The land is currently not in active agricultural use and unlikely to be suitable as productive agriculture in the future as the land is steeply sloped and the current zoning objective, '*Industry*'. Refer to **Figure 2.2** for the zoning map of Ringaskiddy. Therefore, the proposed development will not have a significant effect on the "*removal of productive land from potential agriculture or other beneficial uses*" (land take) during construction.

There will also be no significant negative effects on adjacent land uses as a result of the proposed development.

The upgrade works to the L2545 will include a narrow strip of land at Hammond Lane Metal Recycling Co. Ltd, and a regraded entrance area at the Port of Cork property to the north.

The waste-to-energy facility will be connected to the national electrical grid either via the 38kV electrical substation (known as Loughbeg substation) adjacent to the eastern boundary of the Hammond Lane facility or via the 110kV pylon directly south of the proposed development site. Both options require connection to ESBN infrastructure at the 38kV voltage level.

Loughbeg Substation Option

The connection, if selected, will simply be an extension of the 38kV line into the ESB side of the proposed Indaver electricity compound as this line currently terminates at the existing Loughbeg substation. The grid connection will be made by running underground cables from the ESB side of the Indaver electricity compound to the Loughbeg 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 Loughbeg substation owned by ESBN). These works will be carried out by ESBN. Significant negative effects from the grid connection on land use or land take will not arise if this option is selected.

110kV Pylon Option

An alternate option of connecting to the 110 kV pylon became apparent following a grid connection application (made to ESBN in November 2015) and subsequent offer in 2016.

This option is a viable alternative for ESBN due to the fact that that the 110kV line has capacity and can be re-used to support a 38kV connection over the existing 110kV infrastructure. To facilitate this option, additional trenching (along the route of the existing 10kV overhead cables, which are to be diverted underground) as far as the existing 10 kV overhead pole located in the southern part of the site, would be provided to extend the 38kV cable route underground to the pylon.

The works required to connect the cable from the Indaver site to the overhead power lines would be carried out by ESBN and also for the subsequent works at the Barnahely substation to facilitate a 38kV connection there.

Significant negative effects from the grid connection on land use or land take will not arise if this option is selected.

15.5.2.2 Wayleaves

As discussed in **Section 15.3.2.2**, there are existing wayleaves on Indaver lands. The existing wayleave for the twin 110kV powerlines is parallel to the proposed development site southern boundary, located to the south of the proposed development site. This wayleave will remain during construction and therefore the effect will be neutral.

The existing wayleave on Indaver owned lands for an underground 220kV line to the east of the Gobby Beach car park. This wayleave will remain during construction and therefore the effect will be neutral.

The underground 300mm diameter 19Bar gas transmission main located within the proposed development site has been recently de-commissioned by Gas Networks Ireland (GNI), as discussed in **Section 15.3.4.4**. and the wayleave on the gas pipeline route through the proposed development site will be extinguished in due course. The gas main was not supplying gas to any site previous to its decommissioning, therefore the effect will be neutral.

15.5.2.3 Road Infrastructure, Access and Traffic

Construction (and operational) traffic entering and leaving the proposed development site will use the existing N28 and L2545. A worst-case scenario has been considered in relation to traffic movements during the construction phase (i.e. that the M28 Cork to Ringaskiddy is not operational during the construction phase of the proposed development). Restrictions have been applied to arrival and departure times during both the construction and operation phases (these restrictions will cease to apply when the M28 Cork to Ringaskiddy project becomes operational). There will be sufficient capacity on the existing N28 for the proposed development during the construction of the proposed development. Refer to **Chapter 7** ***Roads and Traffic*** of this EIS for further details.

A section of the L2545 will be upgraded to help alleviate the flooding issues along the road. This is described in detail in **Section 4.5.14** of **Chapter 4** ***Description of the Proposed Development.*** The upgrade works to the L2545 include work on a narrow strip of land at Hammond Lane Metal Recycling Co. Ltd, and a regraded entrance area to provide continued access to lands owned by the Port of Cork. Both companies have been consulted in relation to these upgrade works. The raising of the level of the L2545 will mean that this section of the road will not be subject to flooding. This will have a long-term positive effect on road users and the infrastructure during the construction phase.

15.5.2.4 Drainage

As discussed in **Section 15.5.2.3**, during the construction phase, a section of the L2545 will be upgraded to help alleviate the flooding issues along the road. This is described in detail in **Section 4.5.14** of **Chapter 4** ***Description of the Proposed Development.*** The raising of the level of the L2545 will mean that this section of the road will not be subject to flooding. This will have a positive moderate long-term effect on the drainage infrastructure of the road.

As discussed previously, small areas of the proposed development site along the northern boundary are at risk of pluvial flooding. The levels of the low-lying parts of the site will be raised to a minimum level of 4.55mOD (includes for climate change). This level will offer a very high standard of flood protection to the proposed site and have a long-term moderate positive effect on the drainage of these lands. The increase in site levels is described in detail in **Section 4.5.15** of **Chapter 4** ***Description of the Proposed Development.***

There is no existing foul sewage system on the proposed development site at present. Management of domestic effluent generated on site during the construction phase is described in **Chapter 5** ***Construction Activities,*** **Section 5.6.3**. Foul water generated on-site during construction will be removed off-site by tanker by a licensed contractor to an approved licensed facility and therefore there will not be a significant effect on the existing foul sewage system during construction.

15.5.2.5 Power/Electricity

Electricity Supply for the Proposed Development Site

It is anticipated that the construction phase of the proposed development will require a peak load of 300kVA. In liaison with the ESB Networks, a temporary transformer served from local supplies will be installed to provide part of this requirement.

There is sufficient supply to meet this demand and therefore no significant effect on the local network. The remainder of the power required will be supplied by the use of on-site diesel generators.

Diversions

The existing 10kV overhead power line located on an approximate north-south alignment in the eastern part of the proposed development site, adjacent to the Hammond Lane premises, will require a diversion within the proposed development site. ESBN have been consulted in relation to the proposed diversion and have confirmed that an underground or over ground diversion is possible within the proposed development site.

The indicative diversion route within the proposed development site is shown on engineering drawing **C-000-071.** The potential effects of the proposed diversion are not likely to be significant.

The other 10kV power line and the 38kV power line will not need to be diverted.

The 220kV power lines and corresponding ESB telecoms fibre optics cables beneath the L2545 will need to be raised as a result of the raising of the L2545. Both ESBN and EirGrid have been consulted in relation to the proposed works. ESBN have advised that the power capacity of the cables will be de-rated due to the increased cover resulting from the raised road level which reduces their ability to dissipate heat.

Studies undertaken to date by ESB networks suggest a potential derating of the cable by up to 10% of its power capacity due to less effective heat dissipation though the surrounding backfill material because of the increase depth of material proposed over the cable. It is therefore likely that works will be required by ESB Networks on behalf of Eirgrid to address this.

A number of technically feasible solutions, have been identified by ESB Networks i.e.

- Diverting the cable into new higher ducts;
- Replacing the existing cable - within the existing duct - with a large diameter higher rated cable;
- Leave the cable in its present position and provide thermal backfill over and to the sides of the ducts.

As discussed in **Section 5.3.2**, the worst-case option, in terms of potential effects, would involve diverting the cables into new ducts laid at a higher-level underneath the raised section of road. Three new joint bays would be required to allow the raised cable to be jointed back to the existing cables at either end and to join the short length of new cable to the recovered length of cable respectively. The joint bays would be located in the existing road. The new ducts and joint bays would be constructed within the existing road footprint. The works have been discussed with ESB Networks who have confirmed that they are technically feasible.

These works would only require a very short outage of the 220kV cables (3 to 4 days) to allow for the final cable joints to be done at either end of the cable and will be carried out within the fourteen-week period estimated for the L2545 upgrade works. The effect therefore of these works is not considered to be significant on the network during the construction phase.

15.5.2.6 Water Supply

Water supply for the proposed development site

There is a 450mm diameter Irish Water main in the L2545 road adjacent to the proposed development site's northern boundary.

During the construction phase of the proposed development, water will be required for consumption by the construction personnel, for general construction works and for the construction of the concrete elements of the buildings. The volume of water required during construction on an average daily basis is estimated at approximately 10m^3 per day. This will be supplied by a connection to Irish Water local mains located in the L2545 road to the north of the proposed development site. This will not have a significant effect on the water supply.

Water main diversion

The 450mm diameter Irish Water main will be diverted along the section of road to be raised between the car park and east of Hammond Lane. Cork County Council (acting as agents for Irish Water) and Irish Water have been consulted in relation to the proposed diversions. The potential effects of the proposed diversion are not likely to be significant.

15.5.2.7 Gas Supply

There is an existing underground 300m diameter 19Bar gas transmission main located within the proposed development site which has been recently de-commissioned by Gas Networks Ireland (GNI). The gas main runs along the southern boundary of the proposed development site and then moves northwards through the proposed development site. The gas main terminated at an Above Ground Installation (AGI) along the Haulbowline Road before the bridge to Rocky Island, which has also recently been decommissioned.

GNI have decommissioned the gas pipeline by degassing it and filling it with grout. The pipeline has therefore been made safe and has been left in situ in the ground.

Due to the nature of the proposed works, sections of the in-situ grouted gas main will require removal. No consultation with GNI is required for these works as the wayleave on the gas pipeline route through the proposed development site will be extinguished in due course. The section of pipe to be removed within the proposed development site is shown on the planning drawings.

There is an existing 4 bar 180mm gas distribution main which reduces to 125mm main at the western side of the Hammond Lane entrance, located beneath the L2545 road. This 125mm main will be locally diverted during the construction phase within the road to facilitate the L2545 upgrade. GNI have been consulted in relation to the proposed diversion.

15.5.2.8 Underground services along the L2545 road

In addition to the 450mm diameter watermain, foul main (NMCI), 220kV electricity cables and 4 bar 180mm/125mm gas distribution main, there are public lighting cables, Eircom underground cables and Enet fibre optic cables located underneath the L2545 road.

There is only a marginal increase in road level (circa 100mm) at this location along the L2545. The public lighting columns on the northern side of the road, will have to be raised to match the new road level and the associated duct chambers will also be raised to match the new footpath level.

New Eircom ducting is proposed for the northern road verge to allow Eircom cables to be locally diverted within the road. All of the utilities providers have been consulted in relation to the proposed diversions. Diversion works to the remaining services are not envisaged, however some protection measures like cover slabs may need to be employed during the construction phase. Refer to **Chapter 5 *Construction Activities*** for further details.

Therefore, these diversion works of services along the L2545 will cause a temporary, slight negative effect on the existing underground services along the L2545 road during the construction phase.

As discussed above, a 10kV overhead power line crosses the road. The line will be diverted underground until the northern boundary where the diverted underground cables will be sent back over ground with the construction of a new pole to ESB specifications, see the engineering drawings included with the planning application. Therefore, the effect will be slight and temporary.

15.5.2.9 Surplus Material

The import and export of material is described in **Section 5.5** of **Chapter 5 *Construction Activities*** of this EIS.

It is estimated that almost 74,664m^3 of surplus material will be removed from the proposed development site (including material from the road upgrade works).

Off-site disposal options for surplus clean and inert excavated material include:

- reuse as a by-product on other sites subject to Article 27, under the Waste Directive Regulations 2011.
- recovery at suitable waste permit facilities or licensed soil recovery facilities in accordance with relevant waste legislation; or
- disposal at suitable authorised waste facilities.

Therefore, the effect of exporting of surplus material off-site will depend on the disposal option or combination of options available to the contractor at the time. The reuse of surplus material on other sites (subject to Article 27) will likely have a slight, positive effect on material assets (waste resources) as it diverts surplus clean material from permitted waste facilities. Recovery and disposal of surplus material will likely have a slight negative effect on waste resources.

The environmental effects on these facilities in accepting material will have been addressed during the application process as discussed below. This will ensure that any material proposed to be re-used or accepted at a waste facility will not have a negative effect on the receiving environment of that site or waste facility.

The potential construction traffic effects associated with offsite disposal have been addressed in **Section 7.9** of **Chapter 7** ***Roads and Traffic***.

Re-use as a By-Product (Article 27)

Under Article 5 of the Waste Framework Directive, transposed into Irish legislation under Article 27 of the European Communities (Waste Directive) Regulations 2011, uncontaminated excavated soil and other naturally occurring materials, may be used on sites other than the one from which they were excavated provided the soil and stone material meets the criteria to be considered a by-product. The EPA guidance document, *Guidance on Soil and Stone By-products*[1] (June 2019). There are four by-product conditions that must be met in order for the material to regarded as a by-product:

- further use of the soil and stone is certain;
- the soil and stone can be used directly without any further processing other than normal industrial practice;
- the soil and stone is produced as an integral part of a production process; and
- further use is lawful in that the soil and stone fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

In practice, the EPA[1] has outlined that:

"*Prior to works (i.e. prior to commencement of the development), an economic operator (being either the material producer, or with the express written consent of the material producer) notifies the EPA of the by-product decision. A register of by-product notifications will be maintained and will be available for public inspection online to include details of origin and destination sites for soil and stone by-product.*

Notifications should be accompanied by the full complement of necessary documentation to demonstrate compliance with the four by-product conditions."

At the construction stage of the proposed development, should further use of soil and stone be certain and all other criteria can be fulfilled, the appointed contractor will be responsible for notifying the EPA of the by-product decision.

[1] Available at: https://www.epa.ie/pubs/advice/waste/product/Guidance_on_Soil_and_Stone_By_Product.pdf

Recovery

The licensed soil recovery facilities are usually worked out quarries that are undergoing restoration. They may also be sites where relatively large volumes of soil are being imported to raise natural ground levels. In both cases the soil recovery facilities are licensed to accept only uncontaminated natural soil and stone.

Unlike landfills, soil recovery facilities are not required to have an engineered basal liner, nor are they required to install an engineered cap following completion of restoration or land raising. As such there are no engineering controls to protect groundwater from contamination that may be present in soil used as backfill at these facilities.

Soil recovery facilities, depending on the volumes of material accepted, are permitted under the Third Schedule of the Waste Management (Facility and Registration) Regulations 2007 (SI No. 821 of 2007) as amended, or are required to operate under a Waste Licence granted by the EPA under Part V of the Waste Management Act 1996, as amended.

Depending on the volumes of material recovered, the facility will operate under one of three permits:

- Certificate of Registration (<25,000 tonnes total waste accepted annually);
- Waste Permit (>25,000 to <100,000t total waste accepted annually); or a
- Waste Licence (>100,000t tonnes total waste accepted annually).

For a waste facility (not operated by the local authority) to obtain a Certificate of Registration or a Waste Permit, the application must be made directly to the local authority for which that facility sits. For facilities that apply to operate under a Waste Licence, applications are made to the EPA.

All waste facilities are required to prepare an EIA under Annex I of the EIA Directive (2011/92/EU) as amended by the 2014 Directive (2014/52/EU):

10. Waste disposal installations for the incineration or chemical treatment as defined in Annex I to Directive 2008/98/EC under heading D9 of non-hazardous waste with a capacity exceeding 100 tonnes per day.

The treatment of hazardous waste (up to 24,000 tonnes/year) further strengthens the case for a mandatory EIA regarding the proposed development under Annex I:

9. Waste disposal installations for the incineration, chemical treatment as defined in Annex I to Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste (4) under heading D9, or landfill of hazardous waste, as defined in point 2 of Article 3 of that Directive.

The EIAR must accompany the waste permit application to the EPA for a Waste Licence application. Therefore, the environmental effects of accepting uncontaminated natural soil and stone will have to be assessed. The EPA has prepared guidelines[2] on waste acceptance criteria at authorised soil recovery facilities, ensuring that only uncontaminated natural soil and stone will be accepted at the facility and protect the groundwater from contamination that may be present in soil used as backfill at these facilities.

Disposal

Under the scenario where material exported from the proposed development site is unsuitable for re-use (under Article 27) or recovery, the disposal of material at a landfill may be a disposal option, subject to the material fulfilling certain criteria.

Landfills in Ireland operate under a Waste Licence issued by the EPA and must be constructed in accordance with strict technical requirements set out in the Council Directive 1999/31/EC on the landfill of waste, also known as Landfill Directive.

As discussed above all waste facilities are required to prepare and submit an EIA, under Annex I of the EIA Directive 2011 (2011/92/EU) as amended by the 2014 Directive (2014/52/EU), to the EPA.

[2] Available at: https://www.epa.ie/publications/compliance--enforcement/waste/Guidance-on-Waste-Acceptance-Criteria-at-Authorised-Soil-Recovery-Facilities.pdf

Under the Waste Licence, the EPA will set the type of waste that the landfill facility will be licensed to accept. The landfill will be licensed to accept either Inert, Non-hazardous or Hazardous waste. The criteria of these wastes are set out in Council Decision 2003/33/EC which establishes the criteria and procedures for the acceptance of waste at landfills (with regard to Article 16 of and Annex II to Directive 1999/31/EC). There are no landfills in Ireland licensed to accept hazardous waste material.

15.5.2.10 General Waste Management

Waste generated during the construction phase will be carefully managed under the Construction Waste Management Plan (CWMP) outlined in the Construction Environmental Management Plan (CEMP), refer to **Section 9** of **Appendix 5.1** ***CEMP***, and in accordance with the accepted waste hierarchy which gives precedence to prevention, minimisation, reuse and recycling over disposal with energy recovery and finally disposal to landfill.

This hierarchy will be implemented by identifying opportunities to firstly prevent waste from being produced and secondly minimise the amount of waste produced. Where prevention and minimisation will not be feasible, ways to reuse or recycle waste will be sought, preferably on-site to avoid the effects arising from transportation. If this is not feasible, opportunities to reuse or recycle the waste off-site will be investigated. If this is not feasible, then waste will be sent to an energy recovery facility, and only where there is no alternative, will waste be disposed of to landfill. To achieve this, existing waste management programmes and networks will be used such as the National Waste Prevention Programme, which is implemented by the Environmental Protection Agency.

Therefore, the management of general waste during construction will not have a significant effect on waste resources.

Waste Arising

In general, construction waste materials may include general construction debris, scrap timber and steel, machinery oils and chemical cleaning solutions. The practice of excessive purchase of materials and equipment to allow for anticipated wastage will be avoided.

As discussed above, surplus material will be generated during construction (Refer to **Section 5.5.2** of **Chapter 5** ***Construction Activities*** and in **Section 13.4.1** of **Chapter 13** ***Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*** of this EIS).

In the unlikely event of any evidence of soil contamination being found during work on the proposed development site, the appropriate remediation measures will be employed. Any work of this nature would be carried out in consultation with, and with the approval of the Environmental Department of Cork County Council. The material would be transported to a permitted site via the national and regional road network.

Timber from trees, felled as part of the site preparation, will be sold to the timber industry.

Therefore, the management of construction wastes arising will not have a significant effect on waste resources.

15.5.2.11 Imported Materials

As discussed in **Section 5.5** of **Chapter 5** ***Construction Activities*** of this EIS, almost 30,261m^3 of engineering fill and crushed stone will be imported onto the proposed development site. Of the 30,261m^3 of imported engineering fill and crushed stone required for the construction works, approximately 1,150m^3 consists of shingle required for the coastal protection works, approximately 4,796m^3 will be required for the road upgrade and approximately 24,365m^3 of engineering fill required for the proposed development site (over the eastern and western fields).

The selection and specification of construction materials will be informed by local availability of these materials. Materials will be sourced locally where possible. Refer to **Section 5.5** of **Chapter 5** ***Construction Activities.***

In the context of capacity of the market in Ireland for construction materials, the requirements of the construction phase will not be significant. Therefore, the proposed development will not have a significant effect on the resources of construction materials for the construction of the proposed development.

15.5.3 Operational Phase

15.5.3.1 Land Use, Land Take and Zoning

Land Use

There is no proposed development for the western fields. At some future date Indaver may develop it, subject to planning permission. A possible future use has not been identified at this point. There is no significant effect on this land use due to the operation of the proposed development.

The waste-to-energy element of the proposed development will be constructed on lands east of Hammond Lane and the facility is consistent with the land zoning prescribed to the land under the County Development Plan (2022-2028), refer to **Section 2.4.3.1** of **Chapter 2** ***Planning and Policy and Need for the Scheme***.

The operation of the proposed development will not have a significant effect on land take. All operations will be on Indaver lands and will not require additional land.

As outlined in **Section 15.5.2.1** above, the waste-to-energy facility will be connected to the national electrical grid either via the 38kV electrical substation (known as Loughbeg substation) adjacent to the eastern boundary of the Hammond Lane facility or via the 110kV pylon directly south of the proposed development site. Both options require connection to ESBN infrastructure at the 38kV voltage level. 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 substation owned by ESBN (Loughbeg Substation Option) or IDA lands to the south of the proposed development site (associated with the 110kV Pylon Option as described in **Section 15.5.2.1** above)). These works will be carried out by ESBN. Significant negative effects from the grid connection on land use or land take will not arise.

The Department of Defence during the planning process queried whether the proposed development and associated stack plume might prevent/hinder helicopter operations at the naval base.

This was assessed in two ways. The first was to analyse the physical presence of the proposed development and potential impacts on helicopter operations and flight paths, in to and out of Haulbowline in the context of the existing structures in the harbour area. This assessment was carried out by two independent aviation experts and their reports are included in **Appendices 15.1** and **15.2** to this EIS. Both reports demonstrate that there will be no impact on the safety of helicopter operations and navigation out of the naval base.

The second was to look at the specific characteristics of the plume in relation to key parameters that can influence helicopter engine functionality (such as oxygen, temperature and plume speed) and to assess the distance from the stack tip beyond which there would be no effect. The assessment confirmed that any impact of the plume from the proposed development would be confined to less than 14m from the tip of the stack. The assessment is provided in **Appendix 8.8** to this EIS. This was confirmed by the Department of Defence in July 2017, where the Department stated that if Indaver could confirm that any potential effects of the plume from the stack would be limited to within a 150m radius, then there would be no effect on their helicopter operations out of the Naval Base. This letter is included as **Appendix 15.3** to this EIS.

Hence, as the effect of the plume of 14m is well within the safety margin prescribed by the Department of Defence, significant negative effects on the neighbouring land use of the Naval Base will not arise.

15.5.3.2 Wayleaves

The existing wayleave for the twin 110kV powerlines parallel to the proposed development site southern boundary, located to the south of the proposed development site will remain post construction when the proposed development site is in operation. The existing wayleave on Indaver owned lands for an underground 220kV line to the east of the Gobby Beach car park will remain post construction when the proposed development site is in operation. No significant effects are predicted.

15.5.3.3 Road Infrastructure, Access and Traffic

During the operation of the proposed development, traffic entering and leaving the proposed development site will use the N28 and L2545 (in a worst-case scenario where the M28 Cork to Ringaskiddy project is not yet operational).

There will be sufficient capacity on the existing N28 for the proposed development during the operation of the proposed development. Refer to **Chapter 7** ***Roads and Traffic*** of this EIS for further details.

15.5.3.4 Foul Water/Sewerage

As discussed in **Section 4.15** of **Chapter 4** ***Description of the Proposed Development***, untreated sanitary (foul) water will be pumped directly to the Irish Water sewer located east of Ringaskiddy Village, which will then be pumped to the Lower Harbour wastewater treatment facility at Shanbally.

No significant negative effects on the foul network is predicted as a result of the proposed development.

15.5.3.5 Power/Electricity

Using residual waste to generate electricity will replace non-renewable fossil fuels such as natural gas, coal and oil in the generation of electricity. As discussed in **Section 4.13.5** of **Chapter 4** ***Description of the Proposed Development***, the waste-to-energy facility will generate 21MW of electrical energy produced by the combustion of the waste, of which 2.5MW will be used by the facility itself with the remainder, approximately 18.5 MW being exported to the national grid. The electricity produced by the waste-to-energy facility will be enough to supply the power needs of approximately 30,000 households. Therefore, the proposed development will have a significant positive and long-term effect on material assets in terms of power generation.

15.5.3.6 Water Supply

As discussed in **Section 4.15** of **Chapter 4** ***Description of the Proposed Development***, during operation the proposed development site will be supplied with water from the Irish Water mains water supply located along the L2545.

As discussed in **Section 4.12** of **Chapter 4** ***Description of the Proposed Development***, it is expected the operation of the proposed facility will require 5.4m^3/hr of water and there is sufficient capacity in the mains. The use of a closed steam condensate cycle will minimise the usage of water during the operational phase. The facility will operate according to best available techniques (BAT) to ensure the highest efficiency during the process. Therefore, the proposed development will not have a significant effect on the water resources.

15.5.3.7 Gas Supply

There will be no gas supply required for the operation of the proposed development.

15.5.3.8 General Waste Management

Within the resource recovery centre, adequate provision will be made for the separation of waste at the source. Office and canteen waste generated on the proposed development site will be recycled where appropriate or treated in the waste-to-energy facility. Laboratory chemicals may be treated in the waste-to-energy facility or sent abroad for disposal, as appropriate.

15.5.3.9 Incinerator Bottom Ash

As described in **Section 4.13** of **Chapter 4** ***Description of the Proposed Development*** of this EIS, the incineration process results in the generation of some residual materials including bottom ash.

It is commonly referred to as incinerator bottom ash (IBA) but for the purposes of this EIS, this material is referred to as bottom ash throughout. The potential effects of this material are outlined below.

As outlined in **Table 4.3** of **Section 4.13.4**, the Waste-to-Energy facility will generate 6,583 kg per hour, which is approximately 53,630 tonnes per annum, of bottom ash. The bottom ash is expected to be similar to the bottom ash from Indaver's Meath waste-to-energy facility.

Commission Regulation (EU) No. 1357/2014 and Commission Decision 2014/955/EU is utilised to determine the manner in which bottom ash may be characterised, but it is expected to be non-hazardous, similar to that produced the Indaver plant in Duleek, Co. Meath. Bottom ash from waste incineration in EU countries, including the UK, Netherlands and Belgium, is processed for use as an aggregate in construction of roads or other large-scale projects.

This processed material is known as incinerator bottom ash aggregate (IBAA). The bottom ash will be sent to further processing facilities either locally within Ireland or exported where it will be further refined to a suitable quality to be used as a renewable aggregate in the circular economy. Targeted Policy TP-14.5 in the National Waste Management Plan for a Circular Economy (NWMP) supports "the provision of national capacity for bottom ash from existing thermal treatment facilities, pending the provision of alternative uses which optimise the circularity of this material". Priority Action PA13.2 within the NWMP sees the responsibility assigned to the EPA/Local Government and Industry to "Investigate the potential for circularity of Incinerator Bottom Ash using the by-product or end of waste regulatory mechanisms". Infrastructure development is underway and will be operational for the further processing of IBA during 2025 (Beauparc IBA processing facility at Knockharley Landfill).

Landfill Options in Ireland for Bottom Ash

Any landfills utilised for bottom ash for recovery or disposal must be suitably licensed by the Environmental Protection Agency (EPA) for recovery or disposal operations as laid down in Article 23 of the Waste Framework Directive.

In addition, all landfills 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 material including bottom ash. 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 landfills with a view to reducing their environmental impact.

Similarly, the existing licensing process which all landfills in Ireland 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 landfills 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.

Such conditions include those concerning:

- leachate management
- groundwater and surface water management
- landfill gas management
- odour prevention and control, and
- nuisance monitoring

This comprehensive monitoring regime will ensure that material such as bottom ash when sent to landfill for recovery or disposal will not have a material environmental impact. Therefore, sending bottom ash to licensed landfills for recovery or disposal is not likely to have significant negative effects on the environment as stipulated by the requirements of the EIA Directive.

Available Landfill Options

Operational landfills, which would be suitable for the disposal or recovery of the bottom ash, include:

- Knockharley landfill, Co. Meath.
- Bord Na Mona landfill at Drehid, Co. Kildare.

Knockharley landfill, in County Meath, operated by Knockharley Landfill Ltd, is licensed by the EPA, licence number W0146-04, to accept up to 440,000 tonnes per annum of non-hazardous waste including up to 150,000 tonnes of bottom ash.

Knockharley landfill is located a short distance from the N2 national primary route. Trucks carrying bottom ash to Knockharley landfill would use the national road network, which has more than adequate capacity to accommodate the numbers of trucks. The treatment of the bottom ash in Knockharley landfill is not likely to have a significant negative effect on the environment.

Drehid landfill, County Kildare, operated by Bord Na Móna Plc, is licensed by the EPA, licence number W0201-03, to accept up to 120,000 tonnes per annum of non-hazardous waste.

The Drehid landfill is accessed from the M4 motorway via the R402 and the R403. Trucks carrying bottom ash to Drehid landfill would use the national road network, which has more than adequate capacity to accommodate the numbers of trucks. The disposal of the bottom ash in Drehid landfill is not likely have significant negative effect on the environment.

If the Bottlehill landfill site is available for acceptance of waste, it would be ideally suited to the treatment of bottom ash from Ringaskiddy. Bottlehill would have the added advantage of its proximity to the proposed development when compared to either Drehid or Knockharley. Bottlehill would be accessed from the N20 by trucks using the national road network and has been licensed to accept 217,000 tonnes of non-hazardous waste per annum. Therefore, the disposal of bottom ash to the Bottlehill landfill (if in operation) is not likely have significant negative effects on the environment.

Export Options for Bottom Ash

In the alternative, bottom ash may be exported to outlets in Europe which are already able to recover aggregates from bottom ash.

These outlets have also been subject to the requirements of the Waste Framework and EIA Directives and the EIA process of the relevant jurisdiction. As referred to above in the context of landfills, 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.

As the export of this material would involve movement to another EU county, the requirements of Regulation (EC) No 1013/2006 of 2006, as applicable, on shipments of waste would also need to be adhered to.

Should this option be availed of the bottom ash would be stored on site in the ash hall building until there is enough for export in a bulk consignment. Due to the air handling and filter systems controlling the ventilation of this area, there is no difference between storing 300 to 500 tonnes of bottom ash and the 3,000 tonnes of ash stored prior to export by ship from Ringaskiddy Port. Covered trucks would bring the bottom ash from the proposed development site to the port for loading into the vessel, typically over a two or three-day period in the same vehicles that would transport the material to a national treatment facility if it were available. This equates to just under six trucks per hour over a two-day period, but these truck movements would be confined to the local road network between the proposed development site and Ringaskiddy Port. No significant effects are envisaged.

The export of bottom ash outside the Republic of Ireland has the potential for transboundary effects and these effects are discussed in more detail in **Section 16.7** of **Chapter 16** ***Cumulative Effects, Other Effects and Interactions***.

15.5.3.10 Boiler Ash and Flue Gas Cleaning Residues

Circa 250 kg/h of boiler ash and 1,138 kg/h of flue gas cleaning residues will be produced. Refer to **Sections 4.13.3** and **4.13.4** of **Chapter 4** ***Description of the Proposed Development*** of this EIS.

This is the equivalent of two loads of boiler ash and eight or nine loads of flue gas cleaning residues being sent off site per week. It is expected that the boiler ash and flue gas cleaning residues from the proposed development will be similar in composition to the boiler ash and flue gas cleaning residues from the Meath facility. Boiler ash and flue gas cleaning residues from Indaver's Meath facility are sent for treatment to salt mines licensed to accept this type of waste for recovery in Northern Ireland or Germany.

Export of Boiler Ash and Flue Gas Cleaning Residues

Salt mines are suitable environments for containing boiler ash and flue gas cleaning residues. The impervious nature of salt rock offers an long-term geological barrier and a geo-technically stable environment to guarantee that the residues are permanently isolated from the environment. The absence of water in the underground salt mine's environment removes any risk of leaching of, for example, heavy metals from residues. Hence the recovery of this material by backfilling in the salt mines is not likely to have significant negative effect on the environment.

In 2017 a salt mine facility in Northern Ireland attained planning consent and an environmental permit to operate as a recovery facility for hazardous residues from waste to energy facilities. This facility will be used for the recovery of the boiler ash and flue gas residues.

This facility in Carrickfergus, Co. Antrim has been accepting pre-treated boiler ash and flue gas cleaning residues from the Indaver Meath waste-to-energy facility since October 2018, and the facility is also suitable for receiving and treating similar hazardous residues from the proposed development.

The preparation process for consigning this material off site will consist of a simple dry-bagging system which will mix the residues, into $1m^3$ FIBC bags. The preparation equipment will be located close to the flue gas residue silos within the main process building.

As there is no prerequisite to pre-treat these residues prior to transport off-site, as described in **Section 4.13** of **Chapter 4** ***Description of the Proposed Development***, the transport of the material is not likely to have significant negative effect on the environment.

At times when this recovery facility may not available, for example, during a maintenance outage, the flue gas cleaning residues will be exported for final recovery to German salt mines as described in **Section 4.13** of **Chapter 4** ***Description of the Proposed Development***.

The aforementioned salt mines in Germany and Northern Ireland 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.

The export of boiler ash and flue gas cleaning residues outside the Republic of Ireland has the potential for transboundary effects and these are discussed in further detail in **Section 16.7** in **Chapter 16** ***Cumulative Effects, Other Effects and Interactions***.

Transport Regulations for Exporting Waste

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.

For export to Northern Ireland and Germany, 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.

Shipping

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.

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.

15.5.3.11 Ferrous and Non-ferrous Metal Recovery

Circa 2,900 tonnes per annum of ferrous and non-ferrous metals will be recovered for recycling at an appropriately licensed or permitted facility. Before granting the licence or permit, the competent authority will have already considered the effects on the environment of the facility accepting this material through the licence or permit application process. Consequently, the recovery or recycling of the ferrous and non-ferrous metals is not likely to have significant negative effect on the environment. The recovery or recycling of the ferrous and non-ferrous metals is expected to have a minor positive effect on the environment.

15.5.3.12 Process Inputs/Raw Material Requirements

As discussed in **Section 4.12** of **Chapter 4** ***Description of the Proposed Development***, the proposed development requires a number of process inputs during the operation of the facility.

During the operation of the facility, the major input to the process is waste for incineration. The waste to energy process also requires a number of raw materials including water, light fuel oil and reagents such as lime, ammonia and activated carbon. Activated carbon, ammonia and lime are used as part of the flue gas cleaning process. These raw materials will be located inside the building. Therefore, the operation of the proposed development will not have a significant negative effect on the raw material requirements.

15.6 Mitigation and Monitoring

15.6.1 Construction Phase

The proposed development will be constructed and operated in accordance with good practice in energy and resource conservation, and efficiency.

A construction environmental management plan (CEMP) has been prepared, refer to **Appendix 5.1**, and summarises the overall environmental management strategy that will be adopted and implemented during the construction phase including the responsible and efficient management of material assets including water and waste. Under the CEMP, the contractor will appoint a Construction Waste Co-Ordinator who will be responsible for implementing the construction waste management plan (CWMP). Refer to **Section 9** of **Appendix 5.1** of this EIS for details of the CWMP.

15.6.2 Operational Phase

During operation, energy efficient power systems will be employed, water conservation measures will be implemented, and wastes will be avoided, minimised or recycled where economically feasible.

An air-cooled condenser will be used to cool the steam from the turbine, and air cooling will be used in the transformers. This will minimise the quantity of potable water that will be required.

Wastes arising on site, for example from the administration building and maintenance activities, will be sent off site to be recycled where practical, and treated in the Waste-to-Energy facility if not. A beneficial reuse will be sought for the bottom ash. Metals will be recovered from the bottom ash.

Coastal protection mitigation measures are not required for the waste-to-energy facility element of the development. However, given the concerns raised by An Bord Pleanála (now An Coimisiún Pleanála) and given the low risk that the amenity walkway and viewing platform could be impacted in 40 years' time, coastal protection measures have been included in the proposed development as a precautionary measure so as to reduce the rate of erosion of the glacial till face. Refer to **Chapter 13** ***Soils, Geology, Hydrogeology, Hydrology and Coastal Recession*** for further details.

15.7 Residual Impacts

When the proposed development is in operation, it will have a beneficial residual impact in the reduction in the quantity of hazardous waste being exported to Europe for disposal and in the reduction in the quantity of non-hazardous residual household, commercial and industrial waste which is currently landfilled, exported or treated at a waste to energy facility further from the waste source.

The operation of the waste-to-energy facility will have residual effects in relation to the consumption of resources. Refer to **Table 4.2** in **Chapter 4** ***Description of the Proposed Development*****.**

Boiler ash and flue gas residues will be landfilled in a hazardous waste landfill or sent for recovery in a salt mine. These residues will be sent to a salt mine in Northern Ireland for recovery or exported to landfill or to a salt mine in Germany, if no suitable facility is available in Ireland by the time the plant is commissioned.

The proposed development will also have a number of positive residual effects on material assets. The bottom ash that is generated as a result of the incineration process is reused in many EU countries for use in road construction. Indeed, export of bottom ash for processing to other EU countries may be a route to achieve this if no facility is available in Ireland. Landfilling of these solid residues will only take place, if no viable market can be found. If these residues can be successfully used, it will have a positive effect in that it will reduce the requirement for the use of virgin materials.

The proposed development will have a beneficial residual impact as it will reduce the quantity of hazardous waste being exported to Europe for disposal.

It will also reduce the quantity of non-hazardous industrial, commercial and municipal solid waste going to landfill and also the need to export municipal solid waste for thermal treatment/recovery in Europe.

In addition, the proposed facility will produce approximately 21MW of electricity, with approximately 18.5MW for export to the National Grid. This is enough energy to power approximately 30,000 homes annually and replaces non-renewable fossil fuels in the generation of electricity, which is a significant positive long-term residual impact.

As discussed above and in **Chapter 13** ***Soils, Geology, Hydrogeology, Hydrology and Coastal Recession***, coastal protection measures are proposed to slow the erosion rate of the glacial till face. With the application of the sacrificial material, there will continue to be no impact from coastal erosion on the entire proposed development after 30 years. However, the study found that there could be a risk of an impact on a small section of the proposed development after 40 years but this would be confined to the amenity walkway and viewing platform outside of the security fence line.

Finally, the upgrade of the drainage network on the L2545 will result in a positive moderate long-term residual effect as the risk of flooding on the road will be reduced.

15.8 Cumulative Impacts

The potential for cumulative effects as a result of the construction and operation of the proposed development and the following projects has been assessed where relative (full details on these projects are included in **Chapter 16** ***Cumulative Impacts, Other Impacts and Interactions***:

- **Port of Cork (Planning Ref. No. 224356)** – A new vehicular entrance off the L2545, the temporary use of lands (for a period of 10 years) for open storage of port related cargo, and all ancillary works including road / kerbside re-alignment and security fencing.
- **Cork County Council and Transport Infrastructure Ireland (Planning Ref. No. HA04.HA0053/MA04.MA0014)** - M28 Cork to Ringaskiddy Motorway Scheme (including the Protected Road Scheme element of this project)
- **Port of Cork (Planning Ref. No. OA04.321875)** - Ringaskiddy Port Redevelopment
- **Janssen Sciences Ireland UC (Planning Ref. No. 254704)** – Permission for an upgrade and extension to the existing biomedicines manufacturing facility
- **Pfizer Ireland Pharmaceuticals (Planning Ref. No. 235834)** – Permission for construction of Bld. 124 – Site Lab Building
- **Electricity Supply Board (ESB) (Planning Ref. No. 235104)** – Construction/installation of an open cycle gas turbine (OCGT) generating unit and associated plant and equipment.

If the construction of the aforementioned projects were to be constructed at the same time as the proposed development, cumulative effects could occur. There would be a cumulative demand for construction materials such as concrete, sand, crushed rock and steel and for power, water and telecoms.

The operation of all aforementioned projects, apart from the M28 Cork to Ringaskiddy Motorway Scheme, is likely to result in a cumulative demand for power, water and other utilities. The proposed development will generate power to help meet power demand.

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 effect on material assets as a result of the proposed development.

15.9 References

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